

Regular Posters

POSTER SESSION 1:

Abdominal obesity/Body fat distribution

CENTRAL OBESITY AND ASSOCIATED MORBIDITY IN ELDERLY INDIVIDUALS IN SOUTH-WESTERN SAUDI ARABIA

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Through a home-based survey, all subjects aged 60 years and over (n=810) in the catchment areas of 3 primary health care centers in Abha City were subjected to standardized waist and hip measurements, and central obesity was determined based on the waist circumference (WC) and waist-to-hip ratio (WHR) indicators. Then, 10th, 25th, 50th, 75th and 90th percentiles of WC and WHR were calculated using the frequencies procedure. The age-adjusted prevalence of central obesity among geriatrics was 32.4% and 43.5% based on the WC and WHR indicators respectively. The odds ratio for the 90th percentile of WC versus the 10th percentile was 4.5 (95% CI: 1.9 - 10.8) for diabetes mellitus, and 2.4 (95% CI: 1.0-1.9) for hypertension. The corresponding odds ratios in case of WHR were 2.8 (95% CI: 1.2-6.6) for diabetes and 0.9 (95% CI: 0.4-2.4) for hypertension. After adjustment for sex and other confounding factors, WC was significantly associated with the risk of diabetes ($P < 0.02$) and hypertension ($P = 0.0009$), while WHR was significantly associated with the risk of diabetes ($P = 0.003$) only. These findings suggest that high prevalence of central obesity in old age should be avoided to decrease the risk of diabetes and hypertension. WC is a powerful independent predictor of mainly hypertension risk, while WHC is a good predictor of only diabetes risk.

ESTABLISHING ABDOMINAL HEIGHT CUT-OFFS AND ITS ASSOCIATION TO CONVENTIONAL INDICES OF OBESITY AMONG ARAB CHILDREN AND ADOLESCENTS

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Background: This is the first study to document the association of sagittal abdominal diameter (SDI) to measures of obesity among Arab children and adolescents. It aims to identify associations of SDI to indices of obesity among Saudi youth and to establish cut-offs among Arab youth.

Methods: 964 Saudi children aged 5-17 years [365 pre-pubertal (146 boys & 219 girls); 249 pubertal (125 boys & 124 girls); and 350 post-pubertal (198 boys & 152 girls)] were included in this cross-sectional study. Holtain Khan abdominal caliper by Holtain Ltd. (Crymych, UK) was used to measure sagittal abdominal diameter. Other anthropometric measures of interest were measured routinely.

Results: SDI was significantly correlated to indices of obesity regardless of gender, strongest among pubertal boys. For pre-pubertal, the cut-off is 14cm (equivalent to 50th percentile among girls and 60th percentile among boys); for pubertal, 15cm for girls (30th percentile) and 16cm for boys (50th percentile); and for post pubertal, 21.5cm for girls (70th percentile) and 22cm for boys (80th percentile).

Conclusion: SDI is a reliable indicator of visceral obesity among Arab children and adolescents in particular. Further studies should be done to compare its association to components of metabolic syndrome and indices of insulin resistance.

IS IT NECESSARY TO CONSIDER OBESITY WHEN CONSTRUCTING NORMS FOR HEMOGLOBIN OR WHEN SCREENING FOR ANEMIA USING HEMOGLOBIN LEVELS?

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Objectives: To assess the relationship of total adiposity and abdominal adiposity on hemoglobin levels in Saudi non-pregnant women.

Methods: A cross-sectional study was performed on 530 non-pregnant women ranging in age from 18-65. Body weight, height and waist circumference (WC) were measured using an Avery Beam weighing scale, stadiometer and fiber-glass tape respectively. Hemoglobin levels were estimated using cyanmethemoglobin method. Total obesity was defined as body mass index (BMI) ≥ 30 and abdominal obesity as WC > 88 cm.

Results: The mean and median hemoglobin levels were significantly higher in abdominally obese women compared with totally obese ($P < 0.04$ and < 0.02 respectively) and non obese ones ($P < 0.04$ and < 0.03 respectively). No significant differences in the mean and median hemoglobin levels were observed when abdominally obese women were compared with both abdominally and totally obese ones ($P < 0.7$ for both). The mean and the median hemoglobin levels were virtually identical in non-obese and totally obese women. Statistical analysis showed that the mean hemoglobin level was positively and significantly associated with WC ($P < 0.005$) and negatively and insignificantly associated with BMI ($P < 0.8$).

Conclusion: In view of the positive and significant association between abdominal obesity and the mean hemoglobin level in this population, abdominal obesity should be considered when constructing norms for hemoglobin or when screening for anemia using hemoglobin levels.

FATTY LIVER PREDICTS THE PRESENCE OF CORONARY PLAQUES AND EARLY ATHEROSCLEROSIS INDEPENDENTLY BY VISCERAL FAT ACCUMULATION

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Background: Liver and visceral fat accumulation are increasingly associated with metabolic syndrome, a condition carrying a high risk of coronary artery disease. The independent role of liver and visceral fat accumulation in cardiovascular risk remains unclear.

Aim: To evaluate the association between liver and visceral fat accumulation, insulin resistance, coronary artery disease (CAD), and early atherosclerosis.

Methods: 70 patients (age 53±7) with excess of visceral fat, 30 patients with fatty liver (NAFLD, aged 50±9) and 30 sex, age matched healthy individuals were recruited. Coronary artery disease (CAD) was defined as a stenosis of >50% in at least one major coronary artery by cardiac CT. Fatty Liver was defined by liver minus spleen density ≥ -10 (CT). Early atherosclerosis by Intimal-Media thickness of carotid artery (IMT>7 men; >0.65 women) by Doppler ultrasound, Visceral fat area by CT. Biomarkers of insulin resistance (HOMA), inflammation (CRP) and oxidant- antioxidants (MDA-Paraoxonase) were measured.

Results: Both patients with NAFLD and patients with high visceral fat area (>330±99 cm²) showed higher prevalence of coronary soft plaques (50% vs. 25%, $P < 0.001$), higher prevalence of coronary stenosis (30% vs. 11%, $P < 0.001$), Higher IMT (0.98±0.3 Vs 0.83± 0.1, $P < 0.01$), higher HOMA (4.0±3.0 vs. 2.0±3.2, $P < 0.001$) and higher triglyceride levels (220± 80 vs. 150±50, $P < 0.005$) than healthy controls. Multiple logistic regression showed that fatty liver predicts coronary plaques (OR 2.7, 95%CI 2.3-5.9, $P < 0.001$) and predicts early atherosclerosis (OR 1.8, 95%CI 1.1-2.9, $P < 0.01$) independently by visceral fat accumulation (OR 1.4, 95%CI 1.2-2.8, $P < 0.003$). Subcutaneous fat has no prediction power.

Conclusion: Liver fat accumulation is an independent risk factor for coronary artery disease and early carotid atherosclerosis. This condition may help to optimize the cardiovascular risk stratification.

COORDINATED RESPONSE OF LIPID UPTAKE AND STORAGE MODULATORS TO ROSIGLITAZONE IN SUBCUTANEOUS ADIPOSE TISSUE OF RATS FED AN OBESOGENIC DIET

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Objectives: Peroxisome proliferator-activated receptor (PPAR) γ activation by agonists such as rosiglitazone (RSG) is associated with an induction of fatty acid (FA) storage in peripheral fat depots at the expense of visceral fat, thought to contribute to cardiovascular risk reduction. In this study, we elucidate mechanisms differentially modulated by PPAR γ activation in subcutaneous (inguinal, iWAT) and visceral (retroperitoneal, rWAT) white adipose tissue and highlight a coordinated response of lipid uptake/storage modulators that likely contribute to fat redistribution.

Methods: 32 male Sprague-Dawley rats were fed an obesogenic diet and treated with RSG (30 mg/kg/day in food) for 23 days. We assessed iWAT and rWAT lipoprotein lipase (LPL) mRNA, mass and activity, lipoprotein-triglyceride (TG)-derived FA incorporation into WAT, and expression of FA uptake and esterification genes.

Results: RSG exerted its expected antidiabetic and hypolipidemic effects (fasting plasma insulin, -74%; glucose, -17%; TG, -47%). The agonist stimulated iWAT fat accretion (+48%) and reduced that of rWAT (-34%). PPAR γ activation selectively stimulated LPL activity (fasting: +410%, postprandial: +95%) and mRNA expression in subcutaneous tissue. RSG increased total LPL mass (fasting: +244%, postprandial: +148%) in iWAT, with no noticeable induction in the visceral fat store. Expression of GPIHBP1

mRNA, an LPL stabilizer, was reduced (fasting: -58%, postprandial: -45%) in rWAT by RSG. Such changes were functionally relevant, as per-depot uptake of TG-derived FA was increased (~2-fold) in iWAT and decreased (~50%) in rWAT following PPAR γ activation. Intracellularly, the activity of the lipid esterification enzymes GPAT1 and DGAT1 were preferentially stimulated in iWAT and contributed to a selective induction of lipid incorporation into TG in that depot. The mRNA expression of the FA uptake, transport and esterification genes CD36, FABP4, FATP1, ACS1, GPAT1, AGPAT1, AGPAT2, Lipin1B, and DGAT1 was robustly upregulated by RSG in iWAT whereas expression of several of these genes was decreased in rWAT.

Conclusions: RSG induces TG-rich lipoprotein hydrolysis, LPL expression, mass and activity, as well as FA uptake and esterification in iWAT at the expense of rWAT, at least partly through the coordinated depot-specific modulation of the expression of key modulators of intravascular, membrane and intracellular lipid metabolism.

TACTILE MASSAGE VERSUS RELAXATION EXERCISES AS TREATMENT FOR TYPE 2 DIABETES - A RANDOMIZED CONTROLLED TRIAL

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Aims: For 30 years, a Swedish nurse has developed and practiced a form of contact massage originally called tactile massage (TM). This method involves a pain-free but deliberate, gentle and superficial massage of the skin without manipulation of the underlying muscles. In an earlier pilot study without a control group we found a decrease of 0.8% in HbA1c following ten TM sessions. The aim was to study the effect of (TM) or relaxation exercises using a compact disc (CD) on metabolic control and stress parameters in patients with type 2 diabetes, at primary healthcare centers in Stockholm County.

Methods: The study was carried out as a randomized, controlled intention-to-treat study, of 10 weeks of TM once/week (n=26) or relaxation using a CD once/week (n=27). Blood samples were drawn, urine was collected for 24 hours, and questionnaires including lifestyle variables were completed on three occasions: at baseline, after the 10-week intervention and at a follow-up 3 months after the intervention. HbA1c was the main outcome measure and based on a pilot study, a reduction of 0.8% was used to calculate power.

Results: There was no significant change in HbA1c in either the TM or the relaxation group. S-Adiponectin increased significantly in the TM group ($p=0.0095$), and waist circumference was reduced in both the TM group ($p=0.0001$) and the relaxation group ($p=0.0053$). This reduction was more pronounced in the TM group, with a difference between the groups of 4.0 cm (95% confidence interval 1.6-6.4 cm) after adjustment for confounding factors.

Conclusion: TM therapy could not be recommended as a general treatment in subjects with type 2 diabetes. It is possible, however, that specific patient groups with higher levels of perceived stress could show benefits with this kind of treatment. The significance of the increased S-Adiponectin and the reduced waist shows that TM can reduce the cardiometabolic risk.

CALORIC RESTRICTION AND EXERCISE TRAINING: THE EFFECTIVE LIFE-STYLE INTERVENTION ON REDUCED ABDOMINAL OBESITY

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Aim: To observe effects of lifestyle interventions on body fat accumulation and distribution.

Method: 56 C57BL/6 male mice were randomly divided into 4 groups: group of high-fat (33% fat diet), exercise (treadmill: 5 days/wk, 15wks, 30min/day 70-75% VO₂(max)), CR (caloric restriction, 60% caloric of control) and control. A dynamic composition of body was measured by dual energy X-ray absorptiometry (DEXA).

Results: The mice of control and high-fat groups were in energy surplus state (1.46Kcal/d and 4.21Kcal/d respectively). The weight of control mice gained 2.65±1.17g, including 165% fat increased and abdominal fat accounted for 79.97% of increased total fat after 6 weeks. The weight of high-fat mice gained 5.4±1.30g, including unexpected increased 6.76±2.3g fat and reduced 1.4±0.77g lean tissue, the abdominal fat also accounted for 80.43% of increased total fat during the same period. The weight of mice in the energy-balanced groups (CR and EX group) gained only 0.21±0.25g and 0.78±0.85g while the fat mass reduced 0.32±0.41g and 1.13±1.08g, the abdominal fat accounted for 77.04% and 78.4% of reduced total fat.

Conclusion: DEXA is an effective and non-invasive evaluation method on body composition analysis, especially suitable for the follow-up experiments for multiple time points. Data of DEXA suggested that surplus energy was transformed into body fat in a manner according to feeding materials; approximately 80% of increased fat was accumulated in abdomen. Exercise and CR can effectively reduce body fat accumulation, especially for abdominal fat accumulation. However, the impact of high-fat diet in abdominal fat accumulation at the same period is far greater than that of reducing abdominal fat from the lifestyle intervention (CR and exercise). So establishing a healthy life habits is a proper way to keep away from abdominal obesity.

THE RELATIONSHIP OF BODY FAT DISTRIBUTION PATTERN TO METABOLIC SYNDROME IN US NON-HISPANIC WHITE POPULATION

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Purpose: The purposes of this study were:

1. to determine whether percent bodyfat (%BF) added to the predictive power of waist circumference (WC) to assess risks for modified metabolic syndrome (MMS, where WC was omitted as a criteria) and/or each metabolic co-morbidity by gender; and
2. to examine how the odds ratio (OR) for MMS and each co-morbidity differed by distribution patterns of %BF in overweight men and women with normal or high WC in the US non-Hispanic white population.

Method: National survey data, NHANES III, was used in this study. A total of 960 male and 676 female (BMI between 25 and 30 kg/m²) met these criteria. Bodyfat distribution pattern was divided into 4 categories based on the 50th percentile split for %BF and WC as normal vs high (≥102 cm for men, 88 cm for women, respectively). Odds Ratios (OR) equations were derived from logistic regression models for MMS and metabolic co-morbidities [high triglycerides (TG), low HDL, high blood pressure (BP) and impaired fasting glucose (IFG)]. The lower 50th percentile of %BF with normal WC in the sample was used as the reference.

Results: WC was the strongest positive predictor for MMS and metabolic co-morbidities. WC was independent of gender, except for low HDL and high blood pressure in men. The risk for MMS increased with increasing WC, but not always with increasing BF, for people with BMI 25 < 30. Male with high WC and %BF had the highest risk for MMS (OR=2.1) and for high TG (OR= 1.8). White females with high WC but normal %BF had the highest OR for MMS (OR= 2.2) and for impaired fasting glucose (OR= 3.8). Adding %BF to WC did not increase the ability to predict MMS.

Conclusion: Percent BF provided no advantage over WC in assessing obesity-related metabolic risks in the Non-Hispanic white US samples. The relationship of fat distribution patterns to the risk for MMS differed somewhat by gender. Males with higher %BF and high WC had the greatest risk for MMS, high TG. In women, %BF was associated with decreased risk for high TG, low HDL, and IFG and MMS syndrome when adjusted for WC.

INSULIN THERAPY INDUCED ADIPOSITY EVALUATED BY COMPUTED TOMOGRAPHY IS NOT VISCERAL

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Objective: In individuals with type 2 diabetes, weight gain during treatment with insulin and other agents prevents the attainment of glycemic targets and probably limits the success of treatment. Studies have attempted to elucidate the mechanisms behind the apparent paradox of insulin improving glycemic control and cardiovascular risks, while causing weight gain. The aim of this study is to clarify the influence of insulin therapy on body weight and differential fat distribution (visceral or peripheral) in newly insulin treated type 2 diabetic male patients.

Patients and methods: The study was conducted on 26 type 2 diabetic male patients evaluated at baseline and 12 months after instituting insulin therapy. Body mass index (BMI), absolute waist circumference (AWC), systolic and diastolic blood pressure, HbA1c% were estimated. Abdominal Computed tomography was applied to evaluate areas of subcutaneous fat (SF) and visceral fat (VF) before and after insulin therapy.

Results: There is significant reduction in HbA1c (9.03±0.72 vs. 7.50±0.58, p< 0.001) and significant increase body mass index (BMI =28.92±1.39 vs. 29.81±1.27, p=0.02). However there was non significant changes in the AWC 103.27±3.87 Vs 105.14±3.25, P=0.065, VF 121.01±5.84 Vs 123.01±5.55, p=0.213, SF 206.54±9.93 Vs 212.12±11.62, P = 0.069 and V/S ratio 0.59±0.03 vs. 0.58±0.03, P=0.365.

	Pre insulin	post insulin	P Value
BMI(kg/m ²)	28.92±1.39	29.81±1.27	0.02*
AWC(cm)	103.27±3.87	105.14±3.25	0.065
SBP	125.81±8.53	125±8.33	0.731
DBP	76.88±5.89	77.65±5.56	0.630
HbA1c	9.03±0.72	7.50±0.58	<0.001**
VF	121.01±5.84	123.01±5.55	0.213
SF	206.54±9.93	212.12±11.62	0.069
V/S	0.59±0.03	0.58±0.03	0.365

[Mean changes of BMI, AWC, BP,]

Conclusion: Weight gain in the newly insulin treated type 2 diabetic patients during 12 months duration is equally distributed in both peripheral and visceral fat. So, insulin therapy does not appear to increase the visceral fat in type 2 diabetic patients which is strongly linked to atherosclerosis. Longer-term follow up and bigger sample size are necessary to address the issue of the kinetics of weight gain and to establish the possible correlation with other cardiovascular risk markers.

EARLY CHANGES IN BODY COMPOSITION IN OBESE SUBJECTS SUBMITTED TO DIFFERENT MEDICAL PROGRAMS

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Aims: Our aim was to assess early changes in body composition in obese subjects undergoing two different nutritional programs.

Methods: We prospectively enrolled 82 patients affected by obesity. Patients with BMI > 40 kg/m² were turned towards an intensive 3-month cognitive-behaviour therapy (group 1). Patients with BMI < 40 kg/m² were included in a 1-month nutritional counseling plan (group 2). All patients underwent DXA (Lunar iDXA™, GE Healthcare, USA) whole-body scan before treatment and after three months. Body composition measurements by DXA were used to define changes in fat mass, fat distribution, fat-free mass and total bone mineral content.

Results: Twenty-four patients dropped out the study after the pre-treatment DXA evaluation and were excluded from final analysis. Thirty-three patients (11 males and 22 females, mean BMI 42.4 kg/m²) remained in group 1, 25 patients (7 males and 18 females, mean BMI 33.1 kg/m²) were in group 2. After three months, changes in BMI and in percent fat were not different between groups and between genders. A significant difference was observed in percent fat changes in the android region between the two groups with a larger decrease in fat percentage in group 1 (p=0.0016), both in males and females. No significant differences in percent fat changes were observed in the gynoid region in relation to treatment or gender.

Conclusions: The two different treatment programs produce similar changes in BMI and in whole-body fat percentage, but a few differences may be identified on regional- and gender-based analysis. DXA may provide interesting insights on body fat distribution in relation to treatment programs.

WAIST CIRCUMFERENCE PERCENTILES AND ITS REGIONAL DISPARITIES IN CHINESE SCHOOL-AGE CHILDREN AND ADOLESCENTS

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Background: Waist circumference (WC) is now widely used as a proxy measure of abdominal body fat and is thought to be a better predictor than overall body fat for cardiovascular risk factors both in adults and children. WC cutoffs have been created in many countries, but no such a national WC criteria has been developed in China.

Aim: To set up national representative WC percentiles in China for being used to establish the national WC cutoffs at which obesity-related risk factors elevated and cluster.

Methods: The cross sectional data performed in 15 mainland provinces and in Hong Kong special administer area are combined into a large representative sample of 160 225 school-age children and adolescents aged 7 through 18 years old. Sex and age-specific percentiles are obtained and smoothed by using Cole's LMS method.

Results: Comparisons of growth levels among five regional groups show significant disparities of WC distribution in Chinese different sub-populations. These disparities are not only caused by socioeconomic and urban-rural factors but also north-south geographic-ecological differences. A "gradient" prevalence of central obesity is prospected to be screened out by a uniform WC criterion. Correlate analyses show close interrelations between WC and other physical growth measures. High specialty but less sensitivity is found in the Chinese children by screened out as central obesity using the existing WC cutoffs set up in the American and European countries. Large evidence shows these disparities are mainly caused by the race differences of body composition between the Asian and the Caucasians, especially since the early puberty.

Conclusion: It's necessary for the Chinese to develop her own WC criteria. The percentile curves of WC established in the present study will be the base to do so. However, many further works have to do to set up suitable cutoffs be used in screening the central obesity and be the indicators of cardiovascular risk factors in childhood in China.

THE RELATIONSHIP OF WAIST CIRCUMFERENCE AND MEAN PLATELET VOLUME IN KOREAN MALE

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Background: Platelet activation and aggregation are central processes in the pathophysiology of coronary heart disease. Mean platelet volume (MPV) is a marker of platelet activation and a newly emerging risk factor for atherothrombosis. Elevated mean platelet volume associated with hypercoagulability. In this study, we investigated the association between mean platelet volume and waist circumference on Korean male.

Method: The study subjects were 417 male who visited a health promotion center of a general hospital. Medical history, medication, and life style were recorded through a questionnaire and physical examination was performed on all subjects. We measured platelet count, mean platelet volume (MPV), fasting glucose, total cholesterol, triglycerides, high-density lipoprotein and others by blood sampling.

Result: The mean of MPV on study subjects is 9.74 ± 0.66 fl. The mean of Waist circumference on low tertile MPV group (< 9.2 fl) is 82.0 ± 6.1 cm, on middle tertile MPV group (≥ 9.2 fl, < 10.6 fl) is 84.5 ± 6.7 cm, and on high tertile MPV group (≥ 10.6 fl) is 88.1 ± 5.9 cm. In other words MPV was positively correlated with waist circumference with statistical significance ($p < 0.001$). After Adjusting to age, smoking, body mass index, lipid-profile, blood pressure, fasting glucose, platelet count, between mean platelet volume and waist circumference ($\beta = 0.18$, $p < 0.001$) was a positive association with statistical significance.

Conclusion: In Korean male, there was an independently positive association between mean platelet volume and waist circumference.

WAIST CIRCUMFERENCE AS A MARKER OF CENTRAL ADIPOSITY IN PERITONEAL DIALYSIS PATIENTS

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Background: There are increasing evidences that central adiposity exerts an important role in the cardiometabolic disturbances among patients with chronic kidney disease undergoing dialysis. Some aspects related to the peritoneal dialysis, such as the abdominal distension due to the fluid infusion into the peritoneal cavity, presence of catheter and frequent hernia, raise questions regarding the usefulness of waist circumference as a surrogate marker of abdominal adiposity in patients on this particular dialysis modality. Since this issue has not been so far investigated, we aimed to test the reliability of waist circumference as a marker of central adiposity in peritoneal dialysis patients.

Methods: In this prospective study, we included 107 patients on peritoneal dialysis [56% male, 35% diabetics, age 52 ± 17 years, BMI 24.8 ± 3.9 kg/m², time on dialysis 13 (3-109) months]. Truncal fat assessed by dual-energy X-ray absorptiometry was used as reference for abdominal adiposity. Waist circumference was measured at umbilicus level (mean of 3 sets). All measurements were taken with the empty abdominal cavity.

Results: Waist circumference correlated strongly with the truncal fat both in men ($r = 0.85$; $P < 0.001$) and women ($r = 0.86$; $P < 0.001$). Adjusting for gender, age and BMI, waist circumference was independently associated with the truncal fat ($n = 107$; $b = 0.32$; $P < 0.001$; $R^2 = 0.75$). The agreement between waist circumference and truncal fat was 0.59 (kappa statistic) and the area under curve was 0.90 (ROC curve analysis). After a follow-up of 6 months, we observed that changes in waist circumference correlated with changes in truncal fat ($n = 78$; $r = 0.45$; $P < 0.001$). The kappa statistic was 0.46 indicating a reasonable agreement between the methods. The ROC curve analysis showed that waist circumference was sensitive to detect changes in truncal fat (area under curve 0.74).

Conclusion: The simple method of waist circumference showed to be a good marker of central adiposity among patients on peritoneal dialysis therapy.

VISCERAL ADIPOSITY IS ASSOCIATED WITH C-REACTIVE PROTEIN RATHER THAN WHITE BLOOD CELL COUNT IN APPARENTLY HEALTHY WOMEN

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Background: Recently, it is more concerned that visceral fat induced inflammatory markers may be one of possible causes of cardiovascular disease. WBC counts and C-reactive protein (CRP) are inflammatory markers easily used in clinical field. So, we investigated the association between visceral adiposity and the levels of WBC counts and CRP in healthy women, and also find which one between WBC counts and CRP, is more correlated with the visceral adiposity.

Methods: We performed cross-sectional study of 557 female obese adult subjects. Anthropometry, WBC count, CRP, fasting plasma glucose, uric acid, lipid profile, fasting insulin, body fat percentage were measured and body mass index (BMI), insulin resistance (HOMA-IR) were calculated using formulae. Total adipose tissue (TAT), visceral adipose tissue (VAT) and subcutaneous adipose tissue (SAT) area were calculated using abdominal fat computed tomography.

Results: TAT, VAT and SAT were escalated with a graded increase in quartiles of WBC counts and CRP ($P < .05$ for linear trend) levels. The WBC count was independently correlated with SAT ($P = 0.03$) after adjustment, and CRP was independently correlated with VAT ($P = 0.007$).

Conclusion: In healthy women, CRP level was the inflammatory marker more correlated with the visceral fat than WBC counts.

VISCERAL ADIPOSE TISSUE AREA AND WAIST CIRCUMFERENCE'S CUT-OFF POINT FOR DIGNOSING METABOLIC SYNDROME (PRELIMINARY DATA)

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Background and aim: Abdominal obesity is considered to play a key role in the metabolic syndrome (MS). However, it was not known about the optimal cut point values for visceral adiposity to identify risk for the MS. We have studied the appropriate visceral adipose tissue (VAT) cut-off values for predicting MS factors in the Korean general population.

Methods: We included 3,233 health check-up subjects. The non-adipose variables of the MS were defined using NCEP-ATP-III guideline, and the accuracy of diagnosing at least two of these by VAT area as measured by computed tomography and waist circumference was assessed using area under receiver operating characteristic (AUROC) curves.

Results: In women, the prevalence of MS was 22.3% and in men, that was 26.5%. AUROC curve for VAT exceeded that for waist circumference (men 0.695 vs. 0.661; women 0.770 vs. 0.719). In men, AUROC for diagnosing MS decrease in the order of HOMA index (0.740), VAT, waist circumference, body mass index (0.639) and in women, VAT, HOMA index (0.753), waist

Circumference, body mass index (0.504). For men, the optimal cut points for VAT and waist circumference were 138.5 cm² and 88.3 cm. For women, the optimal cut points for VAT and waist circumference were 84.5 cm² and 82.2 cm.

Conclusions: VAT cut-offs of 138 cm² in men and 85 cm² in women are useful for defining visceral obesity in Korean subjects. Appropriate waist circumference cut points are from 88.3 cm in men and 82.2 cm in women.

REGIONAL ADIPOSITY DIFFERENCES IN FOUR ETHNIC GROUPS

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Previous research has indicated that visceral adipose tissue (VAT) varies by ethnic background. However, some studies have recently suggested that VAT alone is not responsible for the metabolic disturbances associated with obesity. Sub-compartments within the subcutaneous adipose tissue (SAT) depot have recently been identified and differentiated into deep SAT (DSAT) and superficial SAT (SSAT) areas. It has been speculated that excess DSAT is associated with adverse lipid and glycemic profiles.

Objective: To compare the relationship between SAT compartments and body fat mass (BFM) between Aboriginal, Chinese and South Asian compared to a European cohort.

Methods: Healthy Aboriginal, Chinese, European and South Asian (n=822) men and women between the ages of 30 and 65 years were assessed for BFM via DXA, and SAT areas by computer tomography. SAT was subdivided into superficial subcutaneous abdominal adipose tissue (SSAT) and DSAT via identifying the fascia superficialis. Linear regression analysis was performed using DSAT and SSAT as separate dependent variables and FFM and ethnicity as primary independent variables adjusting for age, gender, BFM and smoking status.

Results: Aboriginal (181.0 cm²; p = 0.045) and South Asians (178.3 cm²; p = 0.013) had significantly higher amounts of DSAT, while the Chinese cohort had significantly less when compared to Europeans (114.3 cm²; p < 0.001). The Aboriginal cohort had a significantly higher amount of SSAT than Europeans (123.13 cm² vs. 108.7 cm²; p = 0.04). There were no differences seen in SSAT for South Asians and Chinese cohorts. Separate linear regression analyses showed that in an adjusted model for DSAT (p < 0.001) that Aboriginals and majority of South Asians had a significantly greater DSAT while, Chinese had significantly less DSAT at any given BFM than the European cohort.

Conclusions: These data suggest that specific fat depots are influenced by ethnicity; such that Aboriginals and South Asians have greater amounts of DSAT. This likely contributes to the increased risk for diabetes and cardiovascular disease in these groups.

GENE EXPRESSION PROFILING ON INFLAMMATION AND ANGIOGENESIS PATHWAY IN VISCERAL AND SUBCUTANEOUS ADIPOCYTES

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Introduction: Adipose tissue is a highly active endocrine organ. Excessive adiposity is associated with profound metabolic derangements. Evidence suggests that excessive adiposity leads to micro-hypoxia (more pronounced in visceral adipose tissue) thereby triggering reactive angiogenesis and chronic low grade inflammation.

Aim: To test the hypothesis that site-specific adiposity shows differential inflammatory cytokines and angiogenesis pathway gene expression.

Methods: Three sets of subcutaneous and visceral adipose tissues were obtained during bariatric surgery from three obese Asian subjects. Adipocytes from visceral (test) and subcutaneous (control) tissue were isolated and cultured *in vitro*. PCR array was performed on a panel of:

- i. 84 human inflammatory cytokines and receptor,
- ii. 84 angiogenic (RT² Profiler™ PCR Array) genes using real-time PCR. Fold change in gene expression was calculated using 2^{-Ct}.

Results: Differential gene expression (> 2-fold change) was observed between visceral and subcutaneous adipocyte in the following pathways:

- i. Inflammation - 6 chemokines were up-regulated and 4 were down-regulated.

Up-regulated: chemokines(C-C motif) ligand 21, CCL21 (3.5 fold); chemokines(C-C motif) receptor 5, CCR5 (2.1 fold); CCL7 (2.9 fold); chemokines(C-X-C motif) ligand 13, CXCL13 (3 fold); CXCL11 (2.1 fold); and interleukin-1 α , IL-1 α (2.1 fold).

Down-regulated: IL-1 family member 7, IL1F7 (-2.4 fold); IL13 (-2.2 fold); IL5 (-9.7 fold) and chemokine CCL24 (-4.8 fold).

- ii. Angiogenesis - 4 chemokines were up-regulated and 4 were down-regulated.

Up-regulated: Fibroblast growth factor 2, FGF2 (2.1 fold); hepatocyte growth factor, HGF (2.7 fold); transforming growth factor beta 1, TGF β 1 (2.3 fold); and tissue inhibitor metalloproteinase 1, TIMP1 (2.1 fold).

Down-regulated: interleukin1 beta, IL1B (-3 fold); angiotensin 2, ANGPT2 (-3 fold); neuropilin2, NRP2 (-2.3 fold) and platelet derived growth factor alpha polypeptide, PDGFA.

Conclusion: Visceral adipocytes exhibit pro-angiogenic and pro-inflammatory phenotype. The differential expression of chemokines and angiogenic factor in adipocytes is site dependent.

THE RELATIONSHIP OF BODY MASS INDEX, WAIST CIRCUMFERENCE AND CARDIOVASCULAR RISK FACTORS IN CHINESE ADULT

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Objective: To compare the relative risk of waist circumference (WC) and/or BMI on cardiovascular risk factors.

Methods: The cross-sectional data of 41087 adults (19567 Male, 21520 Female) from the 2002 China National Nutrition and Health Survey were examined. According to the obesity definition of WGOC (BMI, 24 and 28kg/m²; WC, male 85 and 95cm, female 80cm and 90cm), the study population were divided into 9 groups. The prevalence and odds ratio (OR) of cardiovascular disease (CVD) risk factors (hypertension, high fasting plasma glucose and dyslipidemia) were compared among these 9 groups. Variation and standard β were used to compare the relative risk of BMI and/or WC on CVD risk factors.

Results: Both the indexes levels and the odds ratios of CVD risk factors were significantly increased (decreased for HDL-C levels) with the increasing of WC and/or BMI, even after adjusted the effect of age, sex, income, education, sedentary activity and dietary factors. The variation in CVD risk factors explain by WC only and BMI only were quite similar, but a little bit large when combined WC and BMI. The standard β was higher of BMI when predicting systolic BP and was higher of WC when predicting TG, TC and HDL.

Conclusions: BMI and WC have independent effects on CVD risk factors and combination of BMI and WC would be more predictive. Present study provides substantive evidence for the WGOC recommendation of the combination use of BMI and WC classifications.

UTILITY OF THE "HYPERTRIGLYCERIDAEMIC WAIST" FOR THE PREDICTION OF CARDIOMETABOLIC RISK AND EARLY ATHEROSCLEROSIS AMONG CHINESE SUBJECTS

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Background: There has been much controversy regarding the utility of metabolic syndrome for prediction of cardiometabolic risk. The "hypertriglyceridaemic waist" (HTGW) has been proposed as a tool for the prediction of cardiometabolic risk, though this has not been formally evaluated in Chinese subjects.

Subjects and methods: A total of 282 (129M, 153F) healthy Chinese subjects (mean age 41.8 \pm 7.4 years) were recruited from a community health screening project. All subjects underwent measurement of anthropometric indices, full evaluation of cardiometabolic risk factors including an oral glucose tolerance test, as well as sonographic measurement of mesenteric, preperitoneal and subcutaneous fat, assessment for presence of fatty liver, and measurement of carotid intima-medial thickness (IMT). "Hypertriglyceridaemic waist" (HTGW) is defined as the presence of elevated TG \geq 1.7mmol/l, along with central obesity (waist \geq 80cm in females and waist \geq 90cm in males).

Results: Out of the 282 subjects, 21 were classified to have "hypertriglyceridaemic waist". Subjects who had HTGW had significantly higher body weight, WC, % body fat, DBP, TG, AUC glucose at 120mins, fasting insulin, HOMA-IR, and significantly lower HDL cholesterol. Subjects with HTGW had significantly more visceral adiposity as quantified by sonographic measurement of mesenteric and preperitoneal fat, and had significantly higher carotid intima-medial thickness. Presence of "hypertriglyceridaemic waist" is correlated with increased preperitoneal fat and mesenteric fat, presence of fatty liver ($p < 0.01$), and is correlated with increased carotid intima-medial thickness ($r = 0.15$, $p = 0.011$). On logistic regression, age, mesenteric fat thickness and LDL-cholesterol were the independent predictors of carotid intima-medial thickness. For presence of fatty liver, hypertriglyceridaemic waist, increased mesenteric fat thickness and increased carotid IMT were the independent predictors identified on logistic regression.

Conclusions: The "hypertriglyceridaemic waist" is a useful clinical utility and is helpful for identifying Chinese subjects with increased cardiometabolic risk.

DEVELOPMENT OF WAIST CIRCUMFERENCE PERCENTILE CURVES FOR MALAYSIAN CHILDREN AGED 6-16 YEARS

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Aims: To develop age- and gender-specific waist circumference (WC) percentile curves for Malaysian children and adolescents aged 6-16 years. To compare these with equivalent curves from other populations.

Methods: Data from a total of 16,239 children (8123 boys; 8116 girls) were used in this analysis. The sample formed part of a study of nutritional status and dietary habits of Malaysian children currently being conducted nationwide. Height and weight were measured and body mass index (BMI) calculated. WC was measured to the nearest 0.1cm midway between the tenth rib and the iliac crest using a flexible non-elastic tape. The average of two measurements was recorded. Decimal age was calculated. Smoothed curves for the 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th and 97th percentiles were constructed using the LMS Method for boys and girls separately. The curves were then compared with others from UK, Hong Kong and Turkey.

Results: Mean weight, height, WC and BMI for boys were 38.3 \pm 16.7 kg, 141.0 \pm 16.7 cm, 63.9 \pm 12.9 cm, 18.4 \pm 4.8 kg/m² whereas all these measurements were lower among girls at 36.3 \pm 14.4 kg, 139.2 \pm 14.1 cm, 60.7 \pm 10.6 cm, 18.1 \pm 4.5 kg/m², respectively. Mean WC increased with age in both sexes with boys tending to have higher values than the girls at every age and percentile point. Comparisons with other studies indicated that at the 50th percentile, Malaysian children were similar to UK, Hong Kong and Turkish children whereas at the 90th percentile, Malaysians had higher values compared to the other nationalities starting at age 10 years. The 90th percentile was adopted as the cut-off point to identify abdominal obesity in Malaysian children and adolescents.

Conclusion: WC is a suitable surrogate measurement of abdominal fatness and excess fat accumulation at this site is associated with increased risk for type 2 diabetes and cardiovascular diseases. These curves represent the first WC percentiles reported for Malaysian children and adolescents. They should now be employed as a reference for future clinical and epidemiological studies and for identifying children with abdominal obesity.

PREDICTING TOTAL AND TRUNCAL FAT CONTENTS BY ANTHROPOMETRIC MEASUREMENTS IN PREMENOPAUSAL WOMEN; A CROSS-SECTIONAL STUDY

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While obesity is linked with many metabolic diseases, there is uncertainty as what anthropometric measurements would predict the fat content in the body. It is a common belief that body mass index (BMI) and waist hip ratio (WHR) reflect the global adiposity and abdominal adiposity, respectively. We conducted a cross-sectional study to investigate the association between body fat content and selected anthropometric measurements.

Methodology: A random sample of 128 healthy premenopausal females, aged 25-50 years was selected from the local community and stratified into four groups (32 subjects in each) according to their BMI (BMI=18.1-22.5, 22.6-25, 25.1-30, >30). Body weight, height, waist and hip circumferences were measured according to standard protocols. Fat mass; total and truncal, was measured by dual energy X-ray absorptiometry.

Results: Total fat mass correlated with BMI ($r=0.66$, $R^2=0.44$, $p<0.001$), waist circumference ($r=0.67$, $R^2=0.45$, $p<0.001$), hip circumference ($r=0.71$, $R^2=0.50$, $p<0.001$) and WHR ($r=0.28$, $R^2=0.08$, $p=0.002$). In regression analysis when weak variables were excluded in stepwise fashion, hip circumference remained to be the strongest predictor of the total fat content ($r=0.71$, $R^2=0.50$, $P<0.001$).

Truncal fat mass showed significant correlations with BMI ($r=0.68$, $R^2=0.47$, $p<0.001$), waist circumference ($r=0.75$, $R^2=0.56$, $p<0.001$), hip circumference ($r=0.71$, $R^2=0.5$, $p<0.001$) and WHR ($r=0.4$, $R^2=0.16$, $p<0.001$). In regression analysis, waist circumference was the strongest predictor of the truncal fat content ($r=0.75$, $R^2=0.66$, $p<0.001$).

Conclusions: Hip circumference is the best anthropometric measurement that predicts the total fat mass and explains 50% of its variation. Waist circumference is the best anthropometric measurement that predicts the truncal fat mass and accounts for 66% of its variation. While BMI is able to predict both total and truncal fat contents to a lesser degree ($R^2=0.45-0.47$), WHR showed very poor association with fat contents.

RELATIONSHIP OF VISCERAL ADIPOSITY WITH PLASMA ADIPONECTIN CONCENTRATION: EFFECT OF WEIGHT LOSS

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Objective: To investigate the associations between adiponectin levels and adiposity and body fat distribution indices assessed by waist to hip ratio in Iranian women and to determine if the association differ as a result of ethnicity.

Methods: A cross-sectional study of 76 Iranian women free from metabolic disease was performed. Body mass index (BMI), waist circumferences, waist to hip ratio (WHR), body composition, insulin sensitivity, lipid profiles and plasma concentration of adiponectin were measured. Adiponectin changes after a weight loss diet in a subgroup of 42 obese subjects was also assessed.

Results: WHR (waist to hip ratio) was the only variable independently associated to adiponectin (Beta = 0.25, $p<0.05$). A mean increase of $8.2 \pm 24.2\%$ in adiponectin concentration was observed in response to the dietary restriction and weight loss ($p<0.05$).

Conclusions: Our findings provide evidence for association of serum adiponectin level with visceral fat, represented by waist to hip ratio index. Our results also indicate that moderate weight loss result in significant improvements in adiponectin concentration. This provide another biological explanation for the beneficial effect of body weight loss on reducing cardiovascular and diabetes risks in obese patients.

ABDOMINAL OBESITY AMONG FACTORY WORKERS AND ITS RELATED FACTORS IN JAKARTA

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Aims: There is an increasing prevalence of abdominal obesity in Indonesia. The objective of the study was to determine the prevalence of abdominal obesity among factory workers in Jakarta and its related factors.

Methods: A cross-sectional study of 96 subjects was conducted in 2009. Anthropometric parameters were measured and data concerning sociodemographic characteristics were collected by interview. Dietary intake was assessed by food frequency questionnaire (FFQ).

Results: The prevalence of abdominal obesity was 8.3%. Abdominal obesity was only found in women. It also was increased with age ($p=0.01$), increased with longer working duration ($p=0.015$), and decreased with higher physical activity level ($p=0.002$).

Conclusions: The prevalence of abdominal obesity among factory workers in Jakarta was lower than prevalence of abdominal obesity in general population in Indonesia. It was related to gender, age, working duration, and physical activity level.

STEATOHEPATITIS IN PATIENTS TREATED WITH LYCOPENE

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Objectives: Nonalcoholic steatohepatitis (NASH) is a liver disease manifested by inflammation and concurrent fat accumulation in the hepatic tissue. Therapeutic interventions aiming the inflammatory mediator's response are known to have positive effect on NASH progression and outcomes. Plasma cytokine levels and clinical manifestations of in NASH patients treated with proprietary formulation of hepatotropic lycopene are under investigation in the ongoing open label, randomized clinical trial conducted by CamMEDICA, Ltd, UK.

Methods: All patients were diagnosed with NASH using non-invasive liver image analysis. Liver enlargement and elevated plasma transaminases, were main inclusion criteria. Patients were treated with lycopene (7 mg daily) for 4 months. Plasma concentrations of interleukines (IL-1, IL-2, IL-6, IL-10) as well as plasma C-reactive protein (CRP) were measured using commercial kits.

Results: 75% of the patients with confirmed NASH have increased levels of IL-2 exceeding control values ~ 3 times as well as elevated CRP readings. Plasma IL-6 values were increased at much lesser extent (documented in 13% of the patients). No significant variations in plasma IL-1, IL-6 and IL-10 values were observed in untreated NASH patients. Preliminary result showed that 4 month treatment with lycopene reduced enlargement of the liver and elevated level of transaminases in all patients. Only 25% of the NASH patients showed an increased level of IL-2 in plasma after the treatment. Reduction of CRP took place in 67% of the patients. No effect of lycopene has been seen on pretreatment values of IL-6 in plasma. No significant impact on other plasma biochemistry parameters was registered.

Conclusions: Increased plasma levels of IL-2 and CRP seem be a common feature of nonalcoholic steatohepatitis. The relevance of IL-1, IL-6 and IL-10 plasma levels to NASH manifestations remains questionable. Treatment with hepatotropic lycopene formulation attenuates the intensity of steatosis, plasma proinflammatory response (IL-2 and CRP values) and transaminase levels with no negative impact on liver function tests.

WAIST CIRCUMFERENCE VALUES OF SCHOOL CHILDREN AND ADOLESCENTS IN ABEOKUTA, SOUTH-WEST, NIGERIA

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Objectives: The waist circumference (WC) is a useful tool for the identification of those at risk of metabolic and cardiovascular disorders. This study aimed to determine the Waist Circumference (WC) values of apparently healthy Nigerian children and adolescents and to compare them with available data for children from other parts of the world.

Methods: A representative sample of children from seven schools in Abeokuta, a state capital in South west Nigeria were selected using the multi staged random sampling technique. The sample population consisted of 570 children with ages ranging from 5 to 19 years.

Results: WC increased with age in both sexes. The mean value of WC of children aged 5 - 9 years was about the same in both sexes ($p = 0.113$). However, in children older than 9 years, females had higher WC than males ($p = 0.000$). Comparison of 50th percentile WC of Nigerian children with that of American and Spanish children showed that both Nigerian male and female children had the lowest WC values. However, the values were similar to British male children up to 9 years and female children up to 14 years.

Conclusions: The WC value varied with age, sex, race and is lower for Nigerian children than for counterparts in America and Spain. These data are expected to serve as a baseline against which future data can be compared.

EFFECTS OF A RAPID VS. A SLOW WEIGHT LOSS ON BODY COMPOSITION, FAT DISTRIBUTION AND METABOLIC PROFILE

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Background: Weight loss (WL) is associated with decreases in total and abdominal fat mass and improvements in metabolic profile. However, WL without exercise training is also associated with decreases in lean body mass (LBM). It remains unclear which of a rapid or a slow WL (with comparable total body WL) is more beneficial for improving body composition and metabolic profile.

Objective: The aim of this study was to compare the effects of a rapid vs. a slow WL on body composition, body fat distribution and metabolic profile.

Methods: Twenty two sedentary obese postmenopausal women aged between 51 and 74 years participated to the study. For analyses purposes, we studied two groups of women displaying similar total body WL, but different intervention durations [rapid WL: 5 weeks ($n = 5$) vs. slow WL: 15 weeks ($n = 5$)]. Outcome measures were: body composition [total fat mass (FM) and LBM, body fat distribution (trunk FM and waist circumference), lipid profile (total cholesterol, HDL-cholesterol, LDL-cholesterol and triglyceride) and resting blood pressure.

Results: Both groups showed significant and similar decreases in body weight (rapid: -6.08 ± 0.77 kg in 5 weeks vs. slow: -6.34 ± 1.19 kg in 15 weeks; $P < 0.01$ in both cases). Decreases in total FM (rapid WL: -3.16 ± 1.23 kg vs. slow WL: -5.87 ± 1.78 kg; $P < 0.05$) and trunk FM (rapid WL: -2.16 ± 0.99 kg vs. slow WL: -4.13 ± 1.41 kg; $P < 0.05$) were significantly greater in the slow WL group. Furthermore, the slow WL group showed significantly lower decreases in LBM compared to the rapid WL group (rapid WL: -2.94 ± 1.61 vs. slow WL: 0.47 ± 1.21 kg; $P < 0.05$). Finally, no difference was observed between groups for changes in waist circumference, lipid profile and blood pressure.

Discussion: Our results showed that slow WL was associated with significant greater losses in total and trunk FM, and better LBM preservation after controlling for total body weight loss. No significant difference was however observed between groups for the metabolic profile. Due to the small sample size, further studies are needed to confirm our results.

PREVALENCE AND CORRELATES OF ABDOMINAL OBESITY AMONG WOMEN IN HIGH MOUNTAIN VILLAGES OF PAKISTAN

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Introduction: Data on prevalence of abdominal obesity among women is lacking in Pakistan. This study was conducted to assess prevalence and correlates of abdominal obesity among women in a high mountain population of Pakistan during 2007.

Methods: We conducted a population-based cross-sectional study with a sample of 902 women aged 18-70 years living in high mountain villages in northern areas of Pakistan. Trained female nurses measured blood pressure, height, weight, and waist circumference. A standard questionnaire was used to obtain social and lifestyle data. Abdominal obesity was defined as waist circumference $>$ or $=$ 88 cm. Hypertension was defined as systolic BP \geq 140 mmHg and/or diastolic BP \geq 90 mmHg and/or current use of antihypertensive drug treatment. Logistic regression model was used to estimate the adjusted odds ratio (OR) and its 95% confidence interval.

Results: Complete anthropometric measurements were available for 802 women. Of these 99 were pregnant. Out of remaining 703 women 118 (16.8) had abdominal obesity. The prevalence of abdominal obesity was the highest (20.5%) among women with no formal schooling compared to those with secondary (12.4%) or college (10.0%) level education. There was no significant correlation between abdominal obesity and cigarette smoking ($p=0.218$) or chewing tobacco ($p=0.536$). Abdominal obesity was positively and significantly correlated with age (OR=1.03, 95%CI: 1.01, 1.05) and hypertension (OR=2.22, 95%CI: 1.43, 3.43).

Conclusion: Abdominal obesity is substantial public health burden in women in high mountain villages in Pakistan. In this population, hypertension appears to be associated with abdominal obesity.

WEIGHT PATTERNS AND WAIST CIRCUMFERENCE OF NEWLY DIAGNOSED INDIAN TYPE 2 DIABETES PATIENTS

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Aims and objectives: Indian T2D patients present with several special characteristics compared to their counterparts in western countries. For instance, they often present with "lean obesity," a condition when weight is normal, as per BMI but body fat percentage is higher. The present study aimed to classify Indian T2D patients as per BMI, fat percentage (calculated by Bio Electrical Impedance method) and waist circumference, using commonly accepted cut off points, applicable for Indian subjects. BMI was considered normal between 18.5 to $<$ 23 kg/M² for both men and women, body fat percentage for men \sim 25 and for women \sim 30 was regarded normal and waist circumference \leq 90 Cm for men and \leq 80 Cm for women was taken as normal.

Methods: Sixty consecutive newly diagnosed T2D patients of both sexes (30 each), attending our out patient unit, were included for the present study. Various anthropometric measurements were taken such as age (yrs) [F=49.73 \pm 5.72, M=49.90 \pm 6.46], BMI (Kg/m²) [F=29.58 \pm 6.10, M=29.03 \pm 5.61], waist circumference (Cms) [F=96.08 \pm 9.21, M=93.89 \pm 9.58] and body fat percentage (%) [F=32.75 \pm 5.19, M=31.77 \pm 4.39].

Observations: Analysis of data led to following categories of weight status:

- As per BMI and Body Fat Percentage (%): Normal Wt-Non Obese (F=3.33, M=3.33), Normal Wt-Obese (F=3.33, M=10), Overweight-Non Obese (F=26.66, M=0), Overweight- Obese (F=26.66, M=50), Class I Obese (F=16.66, M=26.66), Class II Obese (F=6.66, M=3.33), Class III Obese (F=10, M=6.66).
- AS per BMI and Waist Circumference (%) Normal Wt-Normal WC (F=0, M=3.33), Over weight-Normal WC (F=0, M=3.33), Obese-Normal WC (F=0, M=6.66), Overweight-Increased WC (F=60, M=46.66) and Obese-Increased WC (F=40, M=36.66).

Results: Majority of the Indian patients (38.33%), both men and women, belonged to the category of Overweight-Obese at the time of diagnosis of T2D. This was followed by class I obese (21.66%). Class III obesity was quite rare (8.33%) in Indian patients. Observations based on waist circumference also corresponded with body fat percentage, as majority (53.33%) of the overweight T2D patients had increased waist circumference.

Conclusions: Majority of Indian T2D patients are not obese at the time of diagnosis; most being overweight only but reveal increased body fat% and waist circumference.

PHYSICAL, PHYSIOLOGICAL, AND BIOCHEMICAL CORRELATES OF ABDOMINAL OBESITY AMONG ADOLESCENT GIRLS

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Adolescent age group signifies the proximity to biological maturity that may provide final opportunities for preventing health problems. Among adolescents, girls constitute a vulnerable group, particularly in developing countries where they are traditionally married at an early age and exposed to a greater risk of reproductive morbidity and mortality. Obesity has become a major chronic disorder affecting the larger population more than any other disease in the world. The most affected are the childhood and adolescents. WHO's latest projection confirms this. The main objective of the study is to determine the prevalence of obesity among college going adolescent girls between the age group of 19-21 years and to relate it with relevant socio-economic details, anthropometry measurements, the most essential body composition parameters and related blood parameters. To mention a few, height, weight, waist-height- ratio (WHTR), fat mass, muscle mass, total body water % (TBW%), resting metabolism, visceral fat %, subcutaneous and skeletal muscle fat distribution in trunk, legs and arms, blood parameters like haemoglobin, lipid profile, random blood glucose levels were analysed. The study was carried out in one of the oldest and biggest and the only one government owned women's college in Puducherry, the capital city of Puducherry Union Territory in India. Being a government college it adheres to reservation norms in proportion to the population parameters based on religion, region, location, caste, physically challenged, etc, thus it is the representative of the population in that age group. The sample size was 810. Universal sampling technique was adopted. All the students in final year UG programme and who were within the age range of 19-21 years were part of the study. Standard tools and procedures were used for assessment. Tanita Body Composition Analyser-SC 330 and Omron's Karada Scan HBF 362 were used to assess fat distribution. It was observed that most of the obese individuals had wrong food habits, limited physical activity, menstrual discomforts, and were anaemic. This paper will deal at length the causes and consequence of obesity with mathematical precision.

Keywords: Waist-Height Ratio, TBW %, Resting Metabolism, Abdominal Obesity.

WHAT ARE THE BEST ADIPOSITY INDICES ASSOCIATED WITH AN ABNORMAL GLUCOSE AND LIPID PROFILES IN A CARDIAC REHABILITATION PROGRAM?

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Purpose: Obesity has reached epidemic proportions and is associated with cardiovascular disease (CVD) risk factors and several other health-related problems. Of them, lipoprotein metabolism disorders such as dyslipidemia and type 2 diabetes are of concern among obese individuals. Body mass

index (BMI) is a useful tool used in many studies and outpatient clinics to characterize the presence of obesity. Another adiposity index used in clinic is waist circumference (WC). The objective of the study was to compare adiposity indices defined as BMI, WC and body composition (e.g. % fat mass) as an indicator of an altered lipid profile and fasting glucose plasma in the context of a cardiac rehabilitation (CR) program.

Methods: The study participants consisted of 308 subjects (189 men aged 59 ± 9 yrs and 119 women aged 57 ± 9 yrs; mean ± standard deviation) who were enrolled in the CR program of our institution. Participants were evaluated by registered nurses before entering the program. Blood samples were drawn after a 12 hours overnight fast [lipid profile, apolipoprotein B100 (apoB100) and fasting plasma glucose]. We assessed anthropometric measurements, BMI, WC and body composition using bioimpedance analysis.

Results: Positive correlations between BMI and triglycerides (TG), total cholesterol/HDL ratio and fasting plasma glucose, and negative correlation with high density lipoprotein (HDL) (all $p < 0.001$) were found. WC was correlated negatively with total cholesterol (TC) and HDL, but positively with TG, TC/HDL ratio and fasting plasma glucose (all $p < 0.001$). Percent fat mass was positively correlated with TC ($p < 0.001$), HDL ($p < 0.05$), low density lipoprotein (LDL) ($p < 0.001$) and TC/HDL ratio ($p < 0.05$). Percent fat mass was the only parameter who was correlated with apoB100 ($p < 0.01$).

Conclusions: In participants undergoing a CR program, WC and % of fat mass may be better predictors of an abnormal lipid profile or an elevated apoB100 levels than BMI. In contrast BMI and WC seem better predictors of a suboptimal fasting plasma glucose levels. Therefore, WC may be an additive adiposity measurement to evaluate at risk individuals, and should be assessed at the same time than BMI.

MONITORING THE PREVALENCE OF ABDOMINAL OBESITY AT A POPULATION LEVEL

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Background: Obesity is a leading risk factor for many chronic diseases. Although Body Mass Index (BMI) is positively associated with increased health risks, waistline measurement has been demonstrated to be a more sensitive predictor of health risks. While many tools exist to accurately assess abdominal obesity in clinical settings, the assessment of abdominal obesity at a population level is challenging.

Aims: To monitor the prevalence of abdominal obesity at a population level through the Rapid Risk Factor Surveillance System (RRFSS), a public health telephone surveillance system in Ontario, Canada.

Methods: A validated waistline questionnaire module was implemented through RRFSS between 2008 and 2009. The module consists of questions concerning participants' self-report waistline measurement; clothing size (pant / jean size); clothing fit ("snug", "loose" or "just right"). Information on socioeconomic status, self-reported BMI and physical activity (PA) level were also obtained from RRFSS. Predicted waistline was calculated using validated equations for men and women based on clothing size and fit.

Results: Data were collected from a random sample of 7293 Ontarians aged 18 to 69. Only 62% of participants were able to report their waistline measurement, while 95% (n=6899) reported their clothing size and fit. Among these 6899 participants, mean predicted waistline measurement was 98 cm and 87 cm in men and women, respectively. Waistline measurements were higher among people of older age, low income women, and participants with low education level; high BMI (≥ 25) and low to moderate PA level. On average, 33% of the study population was classified as abdominally obese (waistline ≥ 102 cm for men and ≥ 88 cm for women). Abdominal obesity is more prevalent among women, people of older age, low income, low education level, high BMI (≥ 25) and low to moderate PA level.

Conclusions: A validated waistline questionnaire module through a telephone-based surveillance system provides a practical means to monitor abdominal obesity prevalence at a population level. One third of Ontarian adults were classified as abdominally obese with a higher prevalence rate among women, people of older age, low income, low education level, high BMI (≥ 25) and low to moderate PA level.

CHANGES OF ADIPOSITY INDEXES ASSOCIATED WITH METABOLIC AND HEMODYNAMIC DISORDERS IN RURAL COMMUNITY

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Objectives: Evidences have shown waist circumference (WC) as a better predictor of obesity, dyslipidemia and cardiovascular risk, while others believe that BMI as the major factor for developing these disorders. The objective was to evaluate longitudinal associations between anthropometric and body composition indicators with indexes of metabolic and hemodynamic deterioration in a rural population of Brazil.

Methods: Population based study in a rural community followed 207 individuals aged between 18 and 75 years-old (101 women and 106 men) across 4 years. Demographic, lifestyle, anthropometric, body composition, biochemical and hemodynamic characteristics was assessed in 2004 and 2008. Multivariate linear regression was used to evaluate the effect of BMI and WC changes (2004-2008) over serum lipids and blood pressure levels.

Results: Mean age was 44 years-old. Overweight and obesity prevalences were 22.2% and 6.8%, respectively, in 2008. Thirty-eight percent of the total population was classified as hypertensive objects. Mean values for BMI and WC were increased, overweight and obesity were significantly higher among women. Mean of weight gain along the study was 17.0 kg, BMI increased in general 0.72 kg/m² and WC, 2.15 cm. BMI and WC changes were directly associated to systolic and diastolic blood pressure. Sex, age and BMI changes were associated to total cholesterol, LDL cholesterol and LDL/HDL ratio. No significant association was found with HDL cholesterol.

Conclusions: The rural population studied shown obesity as an important public health matter. BMI changes were shown as an independent predictor for metabolic disorders and for increased diastolic blood pressure, while changes in WC were an independent predictor for systolic blood pressure. Changes of both obesity indexes BMI and WC in four years were presented as potential effects on cardiometabolic disturbances.

DIFFERENT EFFECTS OF INCREASED PHYSICAL ACTIVITY ON CV RISKS IN PRE- AND POSTMENOPAUSAL OBESE AND OVERWEIGHT WOMEN

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Background: Obesity is a growing problem in many countries. A dramatic rise in the prevalence of obesity among children and adults has been attributed to an increased dietary intake of high-energy, high-fat food and a reduced physical activity.

Aim of the study: The aim of our study was to examine a role played by the level of physical activity and lifestyle education in concentrations and in changes in the lipoprotein concentrations in the obese and overweight women.

Methods: The first group included 20 women (55.1 \pm 8.4 yrs; BMI range 33.2 \pm 4.1 kg/m²), and the second group involved 20 women (30.5 \pm 3.6 yrs; BMI range 31.5 \pm 4.0 kg/m²), both with abdominal obesity. Women volunteering to participate in the study underwent a 9-week intervention comprising of controlled physical activity (3 units/a week) and a continuous individualized dietary regimen (3-day food consumption recalls). The probands had their lipid parameters and blood pressure determined. The physical activity unit was defined as at least 55 minutes at between 65-75 % of peak heart rate. Physical activity took a form of bodybuilding in a fitness centre at least twice a week. An alternative physical activity with the same exercise characteristics (walking, jogging, stationary cycling...) was required for the remaining weekdays. The diet consisted of a balanced proportion of nutrients (fats < 30 %, carbohydrates < 55 %), and was calculated to have an energy content of up to 7,200 kJ/day.

Results: After the study there was a significant decrease.

First group 55.1 \pm 8.4 yrs: BMI from 33.2 to 31.1kg/m², waist from 101.2 to 94.9 cm, glucose from 5.9 to 5.5 mmol/l, insulin from 10.6 to 8.2 μ U/ml, total cholesterol from 5.7 to 5.5 mmol/ml, LDL cholesterol from 3.8 to 3.3 mmol/ml.

Second group 30.5 \pm 3.6 yrs: only BMI from 31.5 to 29.1kg/m², waist from 93.24 to 85.46 cm and insulin from 10.2 to 9.0 μ U/ml.

Conclusion: BMI, insulinaemia, glycaemia and cholesterolaemia decreased significantly in the first group in comparison with the second group where only BMI, insulinaemia decreased significantly.

A MECHANISTIC PREDICTION MODEL OF VISCERAL ADIPOSE TISSUE FROM WAIST CIRCUMFERENCE IN ADULTS

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Objectives: Visceral adipose tissue (VAT) is the body component most highly associated with cardiovascular risk factors. The accurate measurement of VAT requires expensive procedures, such as magnetic resonance imaging (MRI) and computed tomography (CT). Although several VAT prediction methods were reported from anthropometric estimates, all of the existing equations are empirical. The aim of this study was to evaluate the applicability of a new mechanistic VAT prediction model. Specifically, we compared model-predicted VAT with MRI-measured VAT as the criterion.

Methods: Based on body composition knowledge, we developed a mechanistic VAT (in L) prediction model from anthropometric measurements, including body mass (M in kg), height (H in dm) and waist circumference (WC in dm): $VAT = 0.0796WC^2 - 0.926M/H$. Total 132 (48 M, 84 F) Caucasian adult subjects were age 37 ± 11 yrs (range 19 - 59 yrs), body mass 73.8 ± 14.3 kg, height 16.98 ± 0.99 dm, BMI 25.6 ± 4.4 (17.1 - 38.3), WC 8.23 ± 1.13 dm (range 6.35 - 11.90 dm for men and 6.27 - 9.96 dm for women).

Results: The measured VAT was 1.46 ± 1.20 L and predicted VAT was 1.48 ± 0.96 L with a non-significant mean difference of -0.02 ± 0.58 L (paired Student's *t* test, $P = 0.66$) for the group of subjects. The measured VAT was highly correlated with predicted VAT ($VAT_m = 1.095VAT_p - 0.163$; $r = 0.88$, $P < 0.001$). Although a Bland-Altman plot showed a significant trend between measured and predicted VAT difference versus VAT mean, the proposed model explained 77% of the variance in VAT.

Conclusion: VAT values can be predicted at the group level from simple anthropometric measurements based on a mechanistic model. Although the model lacks sufficient explanatory power for individual use in clinical settings, it may have utility in epidemiological studies given its relatively small (< 23%) standard error of estimate.

THE PROPER VALUE OF ABDOMINAL CIRCUMFERENCE FOR PREDICTION OF SUBCLINICAL ATHEROSCLEROSIS IN TYPE 2 DIABETIC PATIENTS IN KOREA

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Objectives: Macrovascular complications are the main causes of death among diabetic patients and abdominal obesity is well known as the important component of metabolic syndrome. We investigated to decide the proper value of abdominal circumference which could predict subclinical atherosclerosis in type 2 diabetic patients in Korea.

Methods: We supposed that increased carotid intima-media thickness (IMT) was equivalent to subclinical atherosclerosis and abdominal obesity was judged by four well-known criteria of Korean Society for the Study of Obesity (KSSO), Japan Society for the Study of Obesity (JASSO), International Diabetes Federation (IDF), National Cholesterol Education Program Adult Treatment Panel III (NCEP-ATP III). Mean IMT was measured at both carotid arteries by high resolution B-mode ultrasonography in 771 type 2 diabetic patients. We calculated the relative risk of increased IMT when patients' waist circumference was over the value of each criterion.

Results: The risk of subclinical atherosclerosis was increased in men with abdominal obesity according to three criteria except JASSO. The relative risk of increased IMT was 1.682 (95% CI = 1.147, 2.466) in whose abdominal

circumference was over 90 cm compared with less than 90 cm. But in women, the risk was not increased at all criteria.

Conclusion: The abdominal circumference has practical value as the marker of subclinical atherosclerosis in type 2 diabetic males in Korea, and the proper cut-off value of abdominal circumference as abdominal obesity is 90 cm, which is offered by IDF and KSSO.

Adipokines

WAIST CIRCUMFERENCE DOES NOT PREDICT CIRCULATING ADIPONECTIN LEVELS IN SUB-SAHARAN WOMEN

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Aims: Because of previously reported ethnic differences in determinants and markers of obesity and related metabolic disorders, we sought to investigate circulating levels of adiponectin and their correlates in a sub-Saharan African (sSA) population.

Methods: We studied 70 non-diabetic volunteers (33M/37F) living in Yaoundé, Cameroon, aged 24-69 yr, with BMI 20-42 kg/m². In all participants we measured waist circumference and total body fat by bioimpedance, and obtained a fasting venous blood sample for measurement of plasma glucose, serum insulin and adiponectin concentrations. We performed a euglycaemic hyperinsulinaemic clamp in 1/4 subjects, and HOMAIR was used as surrogate of fasting insulin sensitivity index since it best correlates to clamp measurements.

Results: Males had lower adiponectin levels than females (8.8 ± 4.3 vs. 11.8 ± 5.5 $\mu\text{g/L}$). There was no significant correlation between adiponectin and total body fat ($r_s = -0.03$; NS), whereas adiponectin was inversely correlated with waist circumference ($r_s = -0.39$; $p = 0.001$). Adiponectin correlated negatively with insulin resistance ($r_s = -0.35$; $p = 0.01$). In a regression analysis using fasting adiponectin concentration as the dependent variable, and age, HOMAIR, waist circumference, and fat mass as predictors, waist circumference ($\beta = -3.30$; $p = 0.002$), fat mass ($\beta = -2.68$; $p = 0.01$), and insulin resistance ($\beta = -2.38$; $p = 0.02$) but not age ($\beta = 1.11$; $p = 0.27$) were independent predictors of adiponectin. When considering gender, these relations persisted with the exception of waist circumference in females.

Conclusion: Adiponectin correlates in this study population are comparable to those observed in Caucasians with the exception of waist circumference in women. The metabolic significance of waist circumference is therefore questioned in sSA women.

ADIPONECTIN AND RESISTIN IN METABOLIC SYNDROME: A BIOCHEMICAL AND MOLECULAR GENETIC STUDY IN NORTH INDIAN ADULT WOMEN

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Aims: We conducted a cross-sectional case control study to evaluate the possible involvement of adiponectin and resistin in the biochemical and molecular study in metabolic syndrome women.

Materials & method: 269 women with metabolic syndrome (MetS) and 272 women without metabolic syndrome (wMetS) (according to NCEP ATP III) were included. Serum adiponectin, resistin levels and biochemical variables were estimated in both the group along with 45 T/G and 276 G/T SNP of adiponectin gene, and the -420 C/G SNP of resistin gene, were analyzed.

Results: Serum adiponectin concentrations were reduced in MetS women compared with wMetS ($p < 0.001$) women, whereas serum resistin levels were increased ($p < 0.001$) in MetS women. There was a significant difference between MetS and wMetS women both in the biochemical parameters and genotype frequencies. The significant differences were observed in serum triglyceride, HDL-cholesterol, TC/HDL-C and Insulin resistance (all values $p < 0.001$) in MetS women as compared to wMetS women. The genotype distribution of Adiponectin at 45 T/G position in MetS was significantly different from the wMetS in wild type TT genotype ($p=0.014$; OR=1.25; 95% CI=1.04-1.50) and allele frequency ($p=0.007$; OR=1.23; 95% CI=1.05-1.45), whereas at 276 G/T position only significant difference was found for allele frequency ($p=0.026$; OR=1.17; 95% CI=1.02-1.35). There was no difference observed for the -T45G, GG genotype and for -G276T, TT genotype in MetS and wMetS women. The Resistin -420C/G gene polymorphism in MetS was significantly different from that of wMetS for wild type CC ($p=0.047$; OR=1.19; 95% CI=1.01-1.41) and heterozygous mutant GG ($p=0.036$; OR=0.71; 95% CI=0.50-1.01) genotype and allele frequency ($p=0.014$; OR=1.18; 95% CI=1.03-1.35). The adiponectin gene polymorphisms were negatively correlated while resistin gene were positively correlated with metabolic risk factors and influence serum levels of adiponectin, resistin and other biochemical variables.

Conclusion: Our results propose that the Adiponectin 45-TT and Resistin 420-GG genotype may be potential genetic markers for predicting the causation and progression of metabolic syndrome.

Keywords: Adiponectin, Resistin, Metabolic syndrome.

IMPACT OF IL6 -G174C PROMOTER GENE POLYMORPHISM ON CIRCULATING IL6 LEVEL AND METABOLIC RISK FACTORS IN POLYCYSTIC OVARY SYNDROME WOMEN

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Aims: The present study was aimed to assess the IL6 -G174C gene polymorphism and its association with IL6 level, Insulin Resistance (IR) and metabolic risk markers in north Indian PCOS women.

Methods: A total of 298 women in the age group of 25±10 were enrolled for the present study, of which 126 were PCOS and 172 were Non-PCOS women. Further, both the groups were categorized into obese and lean subgroups. Homeostatic Model Assessment (HOMA) index, circulatory IL6 level and lipid profile were analyzed in both the groups and subgroups. IL6 G174C genotyping was determined by PCR-RFLP methods.

Results: Significant difference between PCOS and Non-PCOS group women for metabolic risk markers and genotype frequencies were present. The significant difference were found in Insulin ($p=0.0033$), HOMA Index ($p=0.0002$), TC/HDL ($p=0.0021$) and serum IL6 level ($p < 0.0001$) between PCOS and Non-PCOS women. Similarly, significant high value for Insulin ($p < 0.0001$), HOMA Index ($p < 0.0001$), TC/HDL ($p=0.0498$) and serum IL6 level ($p < 0.0001$) among PCOS lean and PCOS obese women. The association of 'C' allele of IL6G174C was found significantly more compared to controls ($p < 0.0001$; OR=1.913; 95%CI=1.38-2.66). The mutant, CC+GC of IL6 G174C polymorphism was more significantly associated with PCOS women (61.2%) than Non-PCOS women (59.2%). Further, significant difference was observed in the distribution of mutant (CC+GC) genotype with high WHR ($p=0.0191$), HOMA index ($p=0.031$) and high serum IL6 level ($p=0.0094$) than GG genotype of IL6G174C promoter gene polymorphism in PCOS women.

Conclusion: These findings indicate that mutant, CC+GC at 174 position of IL-6 promoter gene, high circulatory level of IL6 and presence of insulin resistance (HOMA index) may be one of the risk factor for the development of metabolic syndrome among PCOS women.

Keywords: Polycystic ovary syndrome, Insulin resistance, IL6 G/C promoter gene polymorphism, IL6 level.

ADIPONECTIN AND CARDIOVASCULAR RISK FACTORS IN T2DM PATIENTS

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Objectives: Adiponectin, is an adipose tissue-specific adipokine, that circulates in human plasma at high levels, although lower levels are noted with insulin resistance and atherosclerosis. We investigated the associations between plasma adiponectin concentrations and some of the cardiovascular risk factors in patients with T2DM.

Methods: Totally 103 patients with T2DM were recruited. Patients were evaluated for laboratory and anthropometric measurements including serum adiponectin, fasting insulin, fasting plasma glucose, oral glucose tolerance test, HbA1c, HOMA-IR, hsCRP, weight, height, BMI and WHR. Data analyses were done using Food Processor II (FPII) and SPSS version 13 software.

Results: The mean of log₁₀-transformed serum adiponectin concentration was 0.79 ± 0.27 µg/ml. In multivariate linear regression after multiple adjustment, the log of serum adiponectin was independently associated with WHR ($P=0.02$, $t=-2.33$) and markedly but not significantly with age of patients ($P=0.058$, $t=1.92$) and HDL-C ($P=0.056$, $t=1.93$). The univariate linear regression analysis couldn't show any significant relation between the log of serum adiponectin and dietary factors.

Conclusions: Our findings showed that WHR, one of the most important cardiovascular risk factors, can modulate independently adiponectin levels of T2DM patients in inverse manner. Also, the age of patients and HDL-C levels have marked positive effect on circulating levels of this adipocytokine. Thus, adiponectin might be a useful biomarker to prevent developing CVD in type 2 diabetes.

MIXED SPICES INCREASE SERUM ADIPONECTIN PROTEIN (ADIPOKINE) AND INSULIN IN STZ INDUCED HYPERGLYCEMIA RATS

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Spices are used in food preparations around the world with a view to enhance the flavor/aroma of dietary preparations. Apart from this aspect, spices are also used in herbal medicines practice/treatments. Therefore, spices have been studied extensively in relation to their effectiveness in the prevention/control of certain disease conditions. Numerous studies have shown that spices consumed as a part of food provides best control over diabetes (hyperglycemia). Therefore, this project was designed to study the effect of mixed spices namely cinnamon (*Cinnamomum zeylanicum*), cloves (*Syzygium aromaticum* or *Eugenia caryophyllata*), turmeric (*Curcuma longa*) and bay leaves also known as curry leaf (*Murraya koenigii*) on serum glucose, insulin and adiponectin protein concentration in rats induced hyperglycemia with streptozotocin (STZ). Sprague Dawley rats aged three months were injected with 40 mg/kg body weight with STZ in the abdomen in order to induce hyperglycemia. The rats were acclimatized with diets prior allocation to the doses of mixed spices. After having developed hyperglycemia (developed in four to seven days) the rats were divided into four groups i.e. 0 (control), one, two and three gram perday. The aforementioned spices were ground and mixed in equal ratios and added to stock diet 0, 1, 2 and 3 gram of the mixed spices in the feed to be fed to rats daily. The total duration of feeding was 40 days and followed by 20 days after effect of the spices. From the rats blood was collected on the day 0, 21, 31, 41 from the tail and on the 61st day from the heart puncture of the rats. The blood samples were immediately processed for serum separation after each collection and stored for later analysis at -70 C. The serum was analyzed

for adiponectin protein, insulin and glucose. The statistical analysis of the results indicated that serum adiponectin protein, insulin concentrations were significantly ($P < 0.05$) higher whereas serum glucose concentration was significantly ($P < 0.05$) lower in three gram fed spices compared to control one and two gram spices fed groups. This study indicates that the spices provide control over hyperglycemia through increased adiponectin and insulin in circulating blood.

THE ASSOCIATION OF ADIPONECTIN AND IMPAIRED GLUCOSE TOLERANCE IN KOREAN LEAN POPULATION

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Objective: The objective of this study was to examine the association between body mass index (BMI), waist circumference (WC), adiponectin and impaired glucose tolerance (IGT) in the Korean lean population without diabetes.

Methods: The study sample comprised of 9,618 Korean adults aged 20 years or over (5,744 men and 3,874 women) who had participated in the Korean Metabolic Syndrome Research Initiative and had routine health examinations at health promotion centers from April 2006 through December 2007. As indicators of obesity, BMI and WC were classified into tertile groups and adiponectin level was classified into quartile groups for men and women. Lean Group was defined as the lowest tertile BMI and WC. Odds ratio (OR) and 95% confidence intervals (95% CI) were estimated using logistic regression. Model 1 was adjusted for confounding variables, including BMI and WC, whereas model 2 was additionally adjusted adiponectin in the model 1.

Results: The mean age was 45.1 years. Low adiponectin level was only associated with the prevalence of IGT, but neither BMI nor WC was associated with IGT. For men in Lean Group, comparing with the highest quartile of adiponectin, the ORs (95% CI) for IGT were 1.43 (0.91-2.24) in Q3, 1.71 (1.08-2.72) in Q2, and 2.38 (1.48-3.85) in Q1, respectively. For women in Lean Group, comparing with the highest quartile of adiponectin, the ORs (95% CI) for IGT were 5.35 (1.36-21.03) in Q3, 7.08 (1.82-27.59) in Q2, and 7.99 (2.09-30.63) in Q1, respectively.

Conclusion: These results suggest that the adiponectin was associated with IGT, but neither BMI nor WC among Lean Groups. Therefore, adiponectin in lean groups may represent a good predictive biomarker to evaluate IGT.

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OBESITY RELATED INDIVIDUAL METABOLIC RISK AND THE EARLY PHASE OF ATHEROSCLEROSIS - NEW RESULTS FROM THE STYJOBS / EDECTA STUDY

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Obesity is dramatically increasing in the western world and asia. Atherosclerosis (AS), a major consequence of obesity, starts early in life and results in cardiovascular disease. The STYrian Juvenile Obesity Study (STYJOBS) is a prospective study to improve the understanding of AS in obesity by investigation of the "non-biased" early phase. EDECTA (Early Detection of Atherosclerosis) extends STYJOBS up to the age of 55 years.

Aims:

1. Identification of "individual high risk patterns" for cardiovascular disease in young, and middle aged obese people by linking lab parameters, adipose tissue topography, early vascular changes, and clinical data.
2. To establish a serum/plasma/DNA/RNA resource of obese, and normal weight young and middle aged people for advanced research of AS risk in obesity.

Methods: Routine lab, biomarkers (ELISA, HPLC, mass spectrometry etc.), oxidative/nitrosative stress markers, carotis sonography [intima-media thickness (IMT)], and adipose tissue topography. So far investigated 500 obese (age range 5-55 years) and 350 normal weight, age matched healthy controls. Intended, n=1500.

Results: Obese patients exhibit an increased IMT accompanied by a low grade inflammation as early as in the beginning of the 2nd life decade. Dyslipidemia (decreased HDL cholesterol, ApoA1) is associated with increased lipid peroxidation, decreased bioavailability of total NO, incipient insulin resistance, NASH, and increased systolic blood pressure. The ratio between HMW and total adiponectin is significantly decreased in obese patients whereas the LMW / total adiponectin ratio is increased. The HMW / total adiponectin ratio correlated significantly negatively, and the LMW / total adiponectin ratio significantly positively with the IMT. This remained stable after controlling for gender. Multiple regression analysis of body measures and all other lab parameters showed the strongest correlation between HMW adiponectin and carotid IMT. Truncal obesity was negatively associated with HMW adiponectin.

Conclusions: Our data underline the close relationship between obesity, inflammation, incipient type 2 diabetes, hypertension, oxidative stress, dyslipidemia, fatty liver disease and preatherosclerosis. This pathology, and the dysregulation of adipokines is closely linked to the SAT-tissue topography. We provide first evidence that preatherosclerosis in early phases of obesity is yet associated with altered oligomerisation of adiponectin subfractions.

NOCTURNAL REDUCTION OF SERUM ADIPONECTIN IN ABDOMINAL OBESITY SUBJECTS WITH OBSTRUCTIVE SLEEP APNEA-HYPOPNEA SYNDROME

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Aims: Obstructive Sleep apnea-hypopnea syndrome (OSAS) is associated with obesity, diabetes, hypertension, and cardiovascular morbidity. OSAS may be one of the most important risk factors of cardiovascular disorders, although the exact mechanism remains to be elucidated. Adiponectin is an adipose-derived secretory factor with antiatherosclerotic, antidiabetic and antihypertension properties in some experimental studies. In the current study, we investigated the role of adiponectin in OSAS subjects. We further investigated which factor is responsible for dysregulation of adiponectin in OSAS subjects.

Methods: We measured serum adiponectin concentrations in 75 OSAS subjects and 18 controls before sleep and after wake-up. We also examined the effect of one-night nasal continuous positive airway pressure (nCPAP) on adiponectin in 24 severe OSAS subjects. We further investigated the relationship between adiponectin and metabolic parameters in 43 male OSAS subjects.

Results: Circulating adiponectin levels before sleep and after wake-up were lower in severe OSAS subjects than in controls (before sleep; 5.9 ± 2.9 versus 8.8 ± 5.6 $\mu\text{g/mL}$, $P < 0.05$, after wake-up; 5.2 ± 2.6 $\mu\text{g/mL}$ versus 8.5 ± 5.5 $\mu\text{g/mL}$, mean \pm SD, $P < 0.01$, respectively). There were no significant differences in circulating adiponectin levels between the two samples obtained before sleep and after wake-up in moderate OSAS, mild OSAS and control groups. However, serum adiponectin levels in severe OSAS patients diminished significantly during sleep ($P < 0.0001$). One-night nCPAP improved the fall in serum adiponectin levels in 24 severe OSAS subjects ($8.4 \pm 13.4\%$ versus $-10.4 \pm 12.4\%$, $P < 0.05$). The changes in serum adiponectin levels during sleep was positively correlated with waist-hip ratio ($p < 0.05$, $r = 0.34$).

Conclusions: The present study demonstrated nocturnal reduction in circulating adiponectin in severe OSAS subjects. The reduction was improved by one-night nCPAP, and had a significant positive correlation with waist-hip ratio, which may suggest that the dysregulation of adiponectin in OSAS subjects is related to abdominal obesity.

THE EFFECT OF ATORVASTATIN AND FENOFIBRIC ACID ON ADIPOKINE RELEASE FROM ADIPOCYTES OF PATIENTS WITH MIXED DYSLIPIDEMIA AND NORMOLIPIDEMIC SUBJECTS

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Objective: The benefits of statins and fibrates in cardiovascular and metabolic diseases cannot be explained only by the lipid-lowering potential of these agents. The study compared the effects of atorvastatin and fenofibric acid, administered alone or in combination, on the secretory function of human adipocytes.

Design and methods: Isolated adipocytes obtained from visceral and subcutaneous adipose tissue of untreated 19 mixed dyslipidemic patients and 19 subjects with normal lipid profile were incubated in vitro in the presence of atorvastatin (at doses 1-2 μ M) and/or fenofibric acid (2,5-5 μ M).

Results: Visceral adipocytes from dyslipidemic patient released significantly less adiponectin $p < 0.01$ and more leptin $p < 0.001$, resistin $p < 0.001$, TNF α $p < 0.001$, interleukin 6 $p < 0.001$ as well as PAI-1 $p < 0.05$ than those obtained from normolipemic subjects. Both drugs administered alone increased adiponectin secretion and reduced resistin release, while fenofibric acid additionally decreased TNF α release from visceral adipocytes from patients. A combined treatment didn't change additionally release of all studied markers with the exception of PAI-1. In adipocytes of subcutaneous adipose tissue, only atorvastatin and combined treatment with both drugs increased adiponectin release and reduced resistin, TNF α and interleukin-6 secretion. Adipokine secretion by adipocytes of normolipidemic subjects was only slightly affected, mainly when adipocytes were treated with both agents.

Conclusions: The amount and pattern of adipokine release differs between patients with and without lipid abnormalities, and between adipocytes obtained from visceral and subcutaneous adipose tissue. Pleiotropic effects of atorvastatin and fenofibric acid involve their impact on the hormonal function of human adipocytes. This impact may be in part responsible for the clinical effectiveness of statins and fibrates in the prevention and treatment of dyslipidemia-related cardiovascular and metabolic disorders.

THE INHIBITORY EFFECTS OF PKC θ ON ADIPONECTIN EXPRESSION IS MEDIATED BY ERK IN 3T3-L1 ADIPOCYTES

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Research suggests that adiponectin plays an important role in sensitizing insulin action, interestingly lower levels of adiponectin are found in the plasma of obese and type 2 diabetes subjects and in adipose tissue in obese, db/db mice, and insulin-resistant individuals. However, the underlying mechanism by which the adiponectin expression is inhibited remains largely unknown. In this study, we reported that adipogenesis was inhibited by stable over-expression of PKC θ in 3T3-L1 preadipocytes. The prolonged treatment of free fatty acid on mature 3T3-L1 adipocytes reduced expressions of adiponectin in both protein level and mRNA level, accompanied with enhanced phosphorylation of PKC θ and ERK, and impaired expression of PPAR γ 2 mRNA. Neither PD98059, an ERK inhibitor nor PKC θ pseudosubstrates, a specific PKC θ inhibitor, restored palmitate-inhibited PPAR γ 2 mRNA expression and subsequent adiponectin expression. On the other hand, over-expression or activation induced by PMA of PKC θ resulted in the enhanced phosphorylation of ERK in mature 3T3-L1 adipocytes. PKC θ pseudosubstrates significantly inhibited PMA-induced phosphorylation of ERK. The data suggested that activated PKC θ elevated ERK activity, resulting in the impaired expression of PPAR γ 2 mRNA, leading to reduced expression of adiponectin in mature 3T3-L1 adipocytes.

Adipose tissue

REGULATION OF CHOLESTEROL EFFLUX AND APOE SECRETION INDUCED BY APOA1 IN MATURE HUMAN ADIPOCYTES

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Aims: Cholesterol is an essential component of mammalian cell membranes, which in excess is toxic for cells. To counteract this effect, reverse cholesterol transport (RCT) represents a critical pathway for maintaining cholesterol homeostasis in mammals.

The development of cardiovascular disease is inversely correlated to levels of plasma HDL-c, and RCT from peripheral tissues to the liver is the most popular mechanism that explains the ability of HDL to limit atherosclerosis development. Moreover, the apolipoprotein A-I (apoA-I) plays a decisive role in this process but apolipoprotein E (apoE) is also important for the expansion of HDL-particles. The aim of the study was to better determine the interactions between all of these components in mature human adipocytes.

Methods: We have studied the RCT in primary cultures of mature human adipocytes, exploring the effect of apoA-I treatments on cholesterol and apoE secretion, as well as gene expression of the apoE and the transporter ABCA1.

Results: We demonstrate that apoA1 induces a dose dependent increase in cholesterol efflux which is inhibited by brefeldin A. This efflux is totally independent of cAMP as demonstrated by adenylyl cyclase inhibition. At the same time, apoA1 also induces an increase in apoE secretion, but this effect is independent of brefeldin A.

The absence of increasing ABCA1 or apoE gene expression shows that apoA1 has no transcriptional effect on these particular genes.

Conclusions: We suggest that adipose tissue could be considered as a major player in cholesterol homeostasis in humans, as adipose cells are able to regulate their cholesterol efflux and apoE secretion in response to apoA1. Thus, adipose tissue is probably involved in the RCT in humans, and if one looks beyond the situation in macrophages, adipose cells should be considered as a major element in the development of cardiovascular diseases, and in particular atherosclerosis.

EFFECTS OF AGE-INDUCED WEIGHT GAIN ON THE CELL SIZE AND HETEROGENEITY OF DIFFERENT FAT DEPOTS IN THE RAT

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Introduction: The mass of adipose tissue expand during weight gain mostly because of an increase in fat cell size. Fat cell diameter is one of the important determinants of tissue metabolism. The aim of this study was to examine the effects of age-induced weight gain on cell size and heterogeneity in different fat depots.

Materials and methods: Adipose tissues were harvested from subcutaneous (SC), retroperitoneal (RP), perirenal (PR), proximal epididymal (PE) and distal epididymal (DE) regions of two groups of rats with one-month age and 36 % weight difference, but fed with same diet. Diameters of fat cells were measured and calculated using a microscope equipped with a calibrated eyepiece micrometer.

Results: In both groups, animals did not exhibit significant difference between fat depots with regard to cell size. Except for RP depot, the weight gain induced a significant increase in cell size in all regions. The highest and the lowest increase in cell diameter were seen in PR and RP regions, respectively. Coefficient of variation for cell diameter (heterogeneity) was different between DE and other regions in all animals. The effect of weight gain on heterogeneity was not significant.

Conclusion: Age-induced weight gain has different degree of heterotrophic effects on fat cell in different regions. The effects are more prominent on the depots closed to survival tissues such as kidney and reproductive organ than that on visceral and skin. The results of this study can help to improve our knowledge about physiopathology of metabolic diseases such as obesity and diabetes.

SHORT CHAIN FATTY ACIDS REGULATE PRODUCTION OF STROMAL CELL-DERIVED FACTOR-1 (SDF-1) IN PREADIPOCYTES THROUGH THE GPR41 RECEPTOR

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Background: The chemokine SDF-1 (CXCL12), through its receptor CXCR4, is a mediator of chemotaxis and tissue invasion. Although involved in tumour metastasis, it also has protective and anti-inflammatory effects including homing of progenitor cells to vascular injury. SDF-1 expression in adipocytes has been noted in proteomic and genomic studies but its regulation has not been studied. We document effects of short-chain fatty acids (SCFA), which have recently been shown to signal through G protein-coupled receptors (GPR41 and GPR43).

Methods: Murine 3T3-L1 cells were studied before (preadipocytes) and after (adipocytes) differentiation. Human preadipocytes were obtained from cosmetic surgery specimens. Gene expression was measured using RT-PCR and protein secretion using ELISA.

Results: SDF-1 expression and secretion were higher in 3T3-L1 preadipocytes than in adipocytes (80 ng/ml vs 10 ng/ml, $p < 0.001$). There was dose dependent (0.2 - 2 mM) stimulation of expression (up to 5-fold, $p < 0.001$) and secretion ($p < 0.001$) in preadipocytes, but not adipocytes. Order of potency was propionate > butyrate > acetate. Stimulatory effects of SCFA were not replicated with HDAC inhibitors valproate (2mM) or trichostatin (100 nM), but were abolished by pertussis toxin (50 ng/ml). GPR41 was expressed in preadipocytes only, while adipocytes expressed GPR41 and GPR43. 3T3-L1 cells did not express CXCR4 while J774.2 macrophages did not express or secrete SDF-1 but strongly expressed CXCR4. Using siRNA oligonucleotides, expression of GPR41 gene was silenced to < 30% of background in preadipocytes. This decreased SDF-1 expression to < 30% ($p < 0.001$) and abolished the stimulatory effect of SCFA. GPR41, but not GPR43, was expressed (RT-PCR and immunocytochemistry) in human preadipocytes. Again, SDF-1 mRNA and protein secretion were increased by SCFA (propionate > butyrate > acetate).

Conclusions: SDF-1 may mediate preadipocyte interaction with other cells, and its secretion may be regulated by SCFA acting through the GPR41 receptor. Over-commitment of preadipocytes to adipocytes in obese patients may decrease SDF-1 secretion leading to impaired vascular repair. SDF-1 decreases gluconeogenesis and helps preserve beta-cells. Levels are increased by ACE-inhibitors and DPP-IV inhibitors and some of the protective effects of these drug classes may be through actions on preadipocytes.

TESTOSTERONE REGULATION 11 β -HYDROXYSTEROID DEHYDROGENASE TYPE 1 EXPRESSION IN A DEPOT-SPECIFIC AND DOSE-DEPENDENT MANNER IN ADIPOSE TISSUE OF CHILDREN

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Background: Activation of 11 β -hydroxysteroid dehydrogenase type 1 (11 β -HSD1) in adipose tissue results in the production of excess tissue glucocorticoids and induction of adiposity and visceral obesity. Androgens are involved in body fat distribution and regulation of adipose gene.

Objective: To study 11 β -hydroxysteroid dehydrogenase type 1 (11 β -HSD1) mRNA expression in omental (Om) and abdominal subcutaneous (Sc) adipose tissue in children following testosterone and cortisol treatment in vitro.

Subjects and methods: Paired fat biopsies (Om and abdominal Sc) were obtained from 19 prepubertal boys (age 6-14 years, BMI 14-25 kg/m²) undergoing open abdominal surgery. Fragments of adipose tissue were dissected and cultured with testosterone, cortisol or combined for 24h. After culture, gene expression (real-time PCR), 11 β -HSD activity, lipolysis and adipokine secretion were measured.

Results: Testosterone treatment (5 and 50 nM) up-regulated 11 β -HSD1 mRNA expression in a dose-dependent manner ($P < 0.05$) in Om adipose tissue. Testosterone and cortisol increased 11 β -HSD1 mRNA expression in a depot-specific pattern (by 2.5-fold and 2.9-fold in Om, respectively ($P < 0.001$), but not in Sc. Moreover, 11 β -HSD1 enzyme activity was positive correlated to mRNA expression ($r = 0.610$; $P = 0.001$). Adipose tissue mRNA expression of hexose-6-phosphate dehydrogenase (H6PDH) was regulated in very similar to 11 β -HSD1 following hormonal treatment. In addition, testosterone as well as cortisol treatment increased PPAR γ mRNA levels, and decreased the release of TNF- α in Om adipose tissue.

Conclusion: Testosterone stimulated 11 β -HSD1 reductase activity in a dose-dependent and depot-specific manner and consistent with H6PDH, which may therefore contribute to the specific fat distribution and accumulation during puberty.

THE RELATIONSHIP BETWEEN VISCERAL ADIPOSE TISSUE SUB-DEPOTS AND METABOLIC SYNDROME INDICATORS

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Background: Visceral adipose tissue (VAT) has been linked with obesity related health risks in recent studies in children. It is unclear whether sub-depots of VAT including intra- and extra- peritoneal adipose tissue (IPAT, EPAT) have different relationship with health risks.

Methods: Whole body magnetic resonance imaging (MRI) scans were acquired in 121 healthy children (age [mean ± SD] 12.0 ± 3.8 y, BMI percentile 67.2 ± 26.2). IPAT and EPAT are manually separated and quantified on each cross-sectional MRI slice using sliceOmatic (Tomovision Inc.). IPAT and EPAT volumes were calculated from the areas of IPAT and EPAT in each slice times the slice interval. Age adjusted correlations were calculated between IPAT, EPAT and metabolic syndrome indicators including fasting insulin, glucose, triglyceride, HDL-cholesterol and blood pressure (BP). Log transformation has been applied to normalize the distribution of variables when necessary.

Results: IPAT and EPAT are of similar amount (0.33±0.44 L vs. 0.32±0.25 L) and each constitutes ~2% of total adipose tissue. There is no significant sexual difference in IPAT or EPAT amount. In boys, EPAT correlates with insulin more closely than IPAT (r = 0.387 vs. r = 0.446, both p < 0.05). In girls, IPAT correlates more closely with triglyceride (r = 0.399 vs. 0.384), insulin (r = 0.404 vs. 0.348), Glucose (r = 0.347 vs. 0.273) and systolic BP (r = 0.445 vs. 0.422) than EPAT. In girls, EPAT correlates more closely with diastolic BP than IPAT (r = 0.445 vs. 0.437) (All r have P < 0.05).

Conclusion: IPAT and EPAT constitute a relatively small percent of total adipose tissue in healthy children. IPAT correlates more closely with most metabolic syndrome risk indicators than EPAT in girls but not in boys. Future studies need to clarify the role of sub-depots of visceral adipose tissue in growth, obesity and its related health risks.

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EXPRESSION OF ANG II, ACE2 IS HIGHER IN VISCERAL THAN SUBCUTANEOUS ADIPOSE TISSUE IN MICE FED A HIGH FAT DIET

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Objective: Both insulin resistance and central adipose tissue appear to be important in the pathogenesis of the metabolic syndrome and each of its components. The purpose of this study was to determine the difference of angiotensin II (Ang II) and type 2 ACE (ACE2) expression in visceral and subcutaneous adipose tissue.

Methods: We studied:

1. the production of Ang II and ACE2 in vivo from paired samples of high fat diet mice and control mice and
2. the production of Ang II and ACE2 from subcutaneous adipose tissue (SAT) and visceral adipose tissue (VAT).

The effect of valsartan on the expression of Ang II and ACE2 was also observed.

Results: Compared with control mice, body weight, FPG, FINS and Ang II were significantly increased (P < 0.01) and ISI significantly decreased (P < 0.01) in high fat diet mice. Interfered with valsartan, FINS and Ang II were decreased (P < 0.01), ISI was increased (P < 0.01) while body weight, FPG were decreased but not significant (P > 0.05). Expression of Ang II and ACE2 mRNA in VAT and SAT was significantly increased in high fat diet mice compared with those of normal mice (P < 0.01). In high fat diet mice, expression of Ang II and ACE2 mRNA was significantly increased in VAT

than in SAT (P < 0.01) while there was no difference in control mice (P > 0.05). Valsartan decreased the expression of Ang II but did not alter the expression of ACE2 mRNA.

Conclusions: The expression of Ang II and ACE2 is correlation with adipose tissue localization suggesting that local renin-angiotensin system (RAS) may be involved in the development of obesity and obesity-related complications. Valsartan may regulate obesity through Ang II. ACE2 mRNA expression were stimulated in adipose tissue but did not regulated by manipulation of the RAS.

Tab 1 Ang II concentration on serum and adipose tissue of experimental mice.

group	serum AngII(pg/ml)	SAT AngII (pg/mg)	VAT AngII(pg/mg)
control	477.14±53.73	6.10±0.51	6.26±0.55
high fat diet	784.44±55.05*	8.06±0.38*	9.91±0.68*ΔΔ
high fat diet with valsartan treatment	592.01±36.71Δ	7.02±0.53Δ	8.97±0.59Δ

[Ang II concentration on serum and adipose tissue]

Compared with control group, *P < 0.01; compared with high fat diet group, ΔP < 0.01; compared with SAT of high fat diet with enalapril treatment group, ΔΔP < 0.01.

ASSESSMENT OF BODY COMPOSITION IN OBESE SUBJECTS USING BIOELECTRICAL IMPEDANCE AND DUAL-ENERGY X-RAY ABSORPTIOMETRY

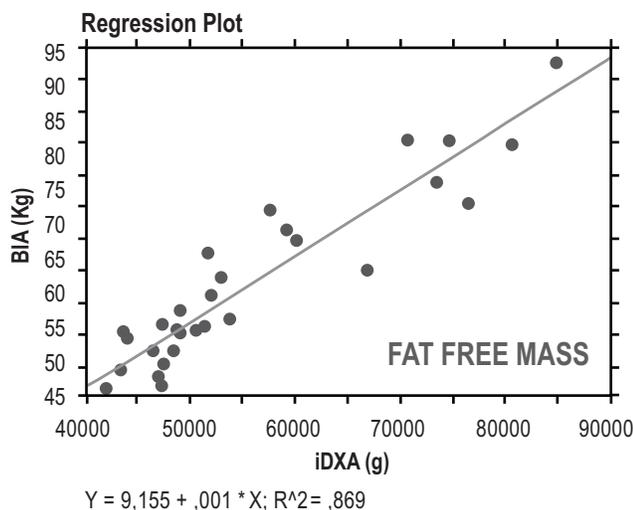
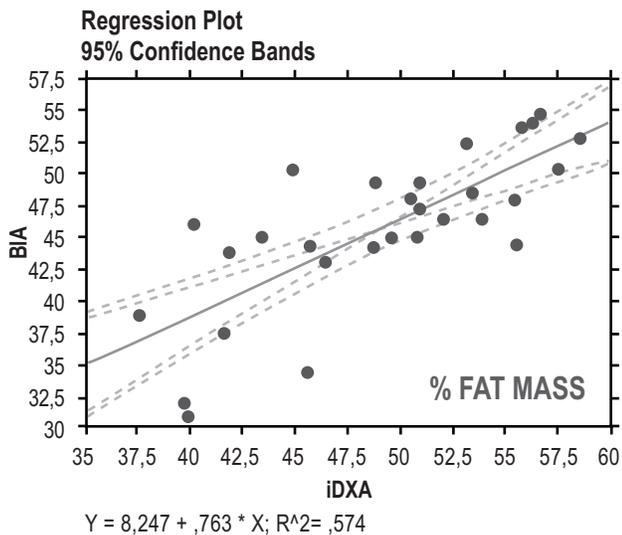
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Aims: The purpose of this study was to compare the bioelectrical impedance analyzer (Tanita, Tokyo, Japan) with the fan beam dual-energy X-ray absorptiometry iDXA (GE Lunar, USA), for assessing body composition in obese subjects.

Methods: Twenty-nine obese patients (19 females, 10 males; mean weight: 115 ± 21.8 kg; mean body mass index: 41 ± 6.7 kg/m²) were evaluated. Body fat mass (%FM), fat free mass (FFM) and bone mineral content (BMC) assessed by BIA were compared with whole-body scan iDXA, software v.12.10 (enCORE). BIA and iDXA measurements were performed within one week before the beginning of a specific weight-loss program. Data were compared by ANOVA and linear regression analysis.

Results: r correlations values between BIA and iDXA for %FM, FFM and BMC were 0.758, 0.932, 0.827, respectively (p < 0.001 for all). Regression plots demonstrated general agreement between methods for %FM, FFM and BMC.



[Regression plots]

Conclusions: Although BIA demonstrated a good agreement with iDXA further investigations are needed to establish whether BIA may be reproducible and may have good correlation when compared with iDXA scan in longitudinal assessment of body composition changes.

EFFECTS OF PIPER SARMENTOSUM ON 11-BETA HYDROXYSTERIOD DEHYDROGENASE TYPE 1 BIOACTIVITY IN VISCERAL ADIPOCYTES AND ADIPONECTIN LEVEL IN OVARIECTOMIZED RATS

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Visceral obesity is caused by increased production of glucocorticoid exclusively within visceral adipose tissues. 11beta-hydroxysteroid dehydrogenase type 1 (11beta-HSD1) converts inactive glucocorticoids into active glucocorticoids, amplifying local glucocorticoids action. It is elevated in adipose tissue in obese humans and rodents, suggesting that adipose tissue glucocorticoid excess may be the causative factor for obesity. Adiponectin, an adipocyte-derived protein, is expressed and secreted from adipocytes. Previous studies have demonstrated that adiponectin expression is reduced in obese subject. This study was conducted to evaluate the effects of Piper sarmentosum (PS) water extract on 11-beta hydroxysteroid dehydrogenase type 1 bioactivity in adipose tissues and plasma adiponectin level in ovariectomized induced obese rats. Twenty-one female Sprague-Dawley rats were randomly divided whereby two groups were ovariectomized (OVX) and given PS extract (0.125g/kg) and water (CTRL) respectively while the third group underwent sham operation and received only water. Visceral adipose tissues were taken for the 11beta-HSD1 enzyme bioactivity analysis after five months of treatments while blood samples for adiponectin measurement were taken at zero, three and five months of treatments. Piper sarmentosum treated group showed a reduction in the bioactivity of the 11beta-HSD1 enzyme with a significant increased ($p < 0.05$) in the plasma adiponectin level compared to CTRL group after five months of treatment. It is suggested that water extract of Piper sarmentosum may have the ability to reduce the amount of visceral fat in the body as shown by the reduction of 11beta-HSD1 enzyme bioactivity and the increase of plasma adiponectin level in ovariectomized induced obese rats.

AN EXPLORATORY STUDY ON EXPRESSION OF BROWN FAT TISSUE IN ABDOMINAL FAT OF HUMAN SUBJECTS

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Objectives: The current study aims to investigate if brown adipose tissue (BAT) exists in white adipose tissue (WAT) of human abdominal adipose tissue, and the correlation between the expression level of the UCP1 (exclusively expressed in brown adipocytes of mitochondria) with the levels of the adult lipid profiles, body mass index, waist circumference and basic metabolism.

Methods: Twenty-five inpatients were recruited from the People's Hospital of Xinjiang Uygur Autonomous Region who was going to receive abdominal surgeries during the August 2008 to January 2009. Three grams fresh adipose tissue was obtained during their surgeries from subcutaneous and visceral fat tissue respectively. Demographic information, anthropometric measurements, blood sample were collected before the surgery. Informed consents were obtained before collecting any data. RT-PCR was used to analyze the existence and expression quantity of UCP1 gene. The primers for amplifying UCP1 were designed by the published sequence of UCP1 cDNA (GeneID: 24860, [ref]NM_021833.3). Simple correlation analyses were used to describe the correlations between the level of UCP1 expression in the abdominal WAT of adult and body mass index, height, weight, waistline, blood pressure, total cholesterol, triglyceride, fasting glucose, high density lipoprotein cholesterol, and insulin resistance index (HOMA-IR).

Results: The mean age of 25 subjects (13 males) are 44.68 ± 10.93 years (25-65). The mRNA of UCP1 was successfully amplified in 21 samples. There was no significant difference ($P=0.822$) in the rate of gray scan value between the UCP1/ β -actin between subcutaneous and visceral WAT. However, only a weak correlation was identified between HOMA-IR and level of UCP1 expression ($r=-0.700$, $P=0.036$).

Conclusions: The present study demonstrates the existence of the gene expression of UCP1 in human abdominal adipose tissue from a group of adult subjects. No significant difference in gene expression levels of UCP1 were found between the subcutaneous and visceral adipose tissue. The expression of UCP1 is weakly correlated with insulin resistance levels. It indicates that the mechanism to insulin resistance related to abdominal fat accumulation may be associated with the amount of BAT in abdominal fat. Further study is needed to verify or replicate the findings of the present study.

Cardiometabolic risk

VITAMIN D STATUS IS ASSOCIATED WITH CARDIOMETABOLIC RISK FACTORS AMONG NON-OBESE ARAB CHILDREN AND ADOLESCENTS

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Background: Hypovitaminosis D has recently gained attention as a novel risk factor for cardiovascular disease. The relationship of vitamin D status to cardiometabolic risk factors among children and adolescents however has been limited. This study aims to determine whether such risk factors are influenced by vitamin D among non-obese Arab children and adolescents.

Methodology: A total of 53 boys (mean age 11.6 ± 3.8 years) and 65 girls (12.1 ± 4.1) participated in this cross-sectional study. Anthropometric measurements included body mass index, waist and circumference as well as blood pressure. Fasting blood samples were also collected and serum glucose as well as lipid profile were measured using routine methods. Serum 25-hydroxyvitamin D was quantified using enzyme-linked immunosorbent assay.

Results: Severe hypovitaminosis D (< 12.5 nmol/l) was noted in 10.6 % of the subjects. Boys had significantly higher cases of severe-moderate hypovitaminosis D as opposed to girls ($p=0.014$). 25-hydroxyvitamin was inversely correlated to age, BMI, systolic and diastolic blood pressure, waist, hips and waist-hip ratio and triglycerides (p -values 0.0002, 0.0004, 0.003, 0.0004, 0.0008, 0.0002, 0.002 and 0.003 respectively). Age and systolic blood pressure were the significant predictors for 25-hydroxyvitamin D, explaining 31 % of the variance perceived ($p=0.0005$).

Conclusion: Significant inverse associations of serum 25-hydroxyvitamin D to cardiometabolic parameters present promising cardioprotective benefits of vitamin D status correction at an early age either by supplementation or lifestyle modification. Follow up studies are needed to validate findings.

METABOLIC RISK FACTORS ASSOCIATED WITH SUBCUTANEOUS FAT DEPOTS IN FOUR DIFFERENT ETHNIC GROUPS

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Recent attention has focused on two sub-compartments of subcutaneous abdominal adipose tissue (SAT): deep (DSAT) and superficial (SSAT) subcutaneous abdominal adipose tissue. Understanding the relationship between these compartments with metabolic risk factors in different ethnic populations may provide additional insight into why ethnic populations such as Aboriginals and South Asians have a higher propensity to develop CVD and type 2 diabetes compared to Europeans, while Chinese populations have a lower prevalence of these diseases.

Objective: To compare the relationship between DSAT and SSAT with metabolic risk factors in Aboriginal, Chinese and South Asian compared to Europeans.

Methods: Healthy Aboriginal, Chinese, European and South Asian ($n=822$) men and women between the ages of 30 and 65 years were assessed for SAT areas by computer tomography. SAT was subdivided into SSAT and DSAT via identifying the fascia superficialis. Between group analysis was conducted via ANOVA using a Bonferroni correction for multiple groups. Pearson correlations were performed between DSAT or SSAT with metabolic risk factors for each ethnic group. Linear regression analysis was conducted using metabolic risk factors (LDL-C, Apolipoprotein B (ApoB), HDL-C, insulin, HOMA) as separate dependent variables and ethnicity and DSAT or SSAT as primary independent variables adjusting for age, sex and smoking status.

Results: Aboriginals had lower LDL-C and higher insulin and HOMA levels compared to Europeans. South Asians had higher LDL-C, ApoB, insulin and HOMA and lower HDL-C levels compared to Europeans ($p < 0.01$ for all). DSAT correlated with glucose, insulin and HOMA in all ethnic groups, whereas significant correlations with HDL-C, triglycerides and ApoB were observed in Aboriginals and Europeans only ($p < 0.05$ for all). SSAT correlated with insulin and HOMA in all ethnic cohorts ($p < 0.05$), except Aboriginals. Correlations were however stronger for DSAT. There were no correlations between SSAT and lipid measures. Linear regression analyses showed that ethnicity and DSAT were independent predictors of HOMA and insulin. SSAT and ethnicity were independent predictors of insulin, HOMA and HDL-C in separate adjusted models.

Conclusions: These data suggest DSAT is more strongly associated with insulin resistance and that excess levels of DSAT may increase risk for diabetes.

PSYCHOEMOTIONAL PROBLEMS ON THE WORKPLACE: PREVALENCE AND ASSOCIATION WITH CARDIOVASCULAR RISK FACTORS

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Objective: To study the prevalence of main psychoemotional disturbances in the working collective of research institute and its association with main cardiovascular risk factors.

Methods: Survey with computer-based system of questionnaires (HADS questionnaire, Reeder inventory) was performed. Cardiovascular risk level was estimated by standard criteria (SCORE). The study was conducted in working collective of research workers (n=467).

Results: The prevalence of high stress by Reeder inventory was 7,8% in men and 11,4% in women. The prevalence of high stress by self-estimate was 43,8% in men and 52,2% in women. Anxiety was revealed in 36,3% men and in 38,9% women. Depression prevalence was 5,8% in men and 6,3% in women. Anxiety was associated with increased body mass, abdominal obesity, low physical activity and hypertension, and as a result with high cardiovascular risk.

Conclusion: The main psychoemotional disturbance in the working collective of research workers is anxiety. Workers do not feel the difference with stress and consider all their psychoemotional disturbances as high stress. Anxiety is associated with increased cardiovascular risk factors and increased risk. Workplace preventive interventions are necessary for decreasing anxiety and cardiovascular risk.

CONTRIBUTION OF ADIPONECTIN TO THE CARDIOMETABOLIC RISK PROFILE OF LPL DEFICIENT WOMEN

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Aims: Partial lipoprotein lipase deficiency (LPLD) due to mutations in the LPL gene represents a significant cardiometabolic risk in both men and women. Plasma adiponectin, obesity and its correlates as well as the menopausal status are important risk modulators. The objective of this study was to evaluate the contribution of plasma adiponectin to the risk profile of women carrying LPL gene variants known to be associated with LPLD.

Methods: The studied sample included 505 non-diabetic women of French-Canadian origin among which 101 with LPLD and 404 controls. The association of plasma adiponectin with LPLD was performed using multiple stepwise regression models. Covariates included the menopausal status, anthropometric measures, lipids (TG, HDL-C, LDL-C), fasting glucose, smoking and other covariates. Analyses were also performed after stratification for the menopausal status (premenopausal vs. postmenopausal).

Results: Plasma adiponectin levels were significantly lower in the LPLD groups (10.07mg/l±5.09 vs. 7.47mg/l±4.43 p< 0.001). The contribution of low adiponectin values to the cardiometabolic risk profile of LPLD was independent of waist circumference and all other studied covariates (Table provides odds ratio (OR)). The variance in adiponectin explained by LPLD status was significant in both premenopausal (R²= 8%, p< 0.001) and postmenopausal women (R²= 4%, p< 0.001).

Conclusion: These results suggest that low plasma adiponectin contributes to the cardiometabolic risk profile of women with LPLD, independently of anthropometric, lipid and glucose covariates.

	(Model1) p-Value	(Model2) p-Value	(Model3) p-Value
Adiponectin	(22.72) <0.001	(17,85) <0.001	(5,55) 0.025
Wait			
Circumference		(1.03) 0.006	(0.99) 0.777
TG and All others			(6.26) <0.001

[CONTRIBUTION OF LOW ADIPONECTIN TO LPLD]

ASSESSMENT OF THE CARDIOMETABOLIC RISK ASSOCIATED WITH THE HYPERTRIGLYCERIDEMIC WAIST PHENOTYPE REQUIRES FINE PHENOTYPING IN THE PRESENCE OF SEVERE HYPERTRIGLYCERIDEMIA

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Aims: Hypertriglyceridemia (hyperTG) is characterized by elevated fasting plasma triglycerides (TG) levels. Combined with abdominal obesity, it represents an important risk factor of cardiometabolic and clinical complications. Considering the endemization of obesity and related comorbidities worldwide, the burden of hyperTG is expected to increase, including among individuals having specific genetic predispositions to exhibit the most severe forms (TG > 9 mmol/L). However, the cardiometabolic risk associated with severe hyperTG is not well documented. The objective of the present study is to document the clinical cardiometabolic risk profile observed in different phenotypes of severe hyperTG.

Methods: A sample of 360 French-Canadian subjects with TG level > 9 mmol/L has been classified based on Fredrickson's criteria taking into account the associated genetic susceptibilities (Type I, III, IV and V). The association of these hyperTG phenotypes with clinical endpoints and cardiometabolic risk covariates (listed in the table) has been investigated using logistic regression models compared to the normolipemic subjects (n=406) and adjusted for age, gender and smoking status.

Results: Odds ratio (p-values) are presented in the table. Briefly, notable differences in the clinical consequences of hyperTG were observed between the phenotypes. Except in Type I, all severe hyperTG phenotypes are associated with obesity. Peripheral artery disease is a feature of Type III whereas risk of pancreatitis is higher in Type I but present in all phenotypes. Type V showed the most deleterious risk profile.

Conclusions: Although often associated with obesity, different hyperTG phenotypes can lead to different clinical complications. This suggests that in presence of severe hyperTG, the assessment of the underlying causes should be performed in order to adequately evaluate the cardiometabolic risk.

	Type I (n=41)	Type III (n=62)	Type IV (n=176)	Type V (n=81)
Obesity	2.14 (0.074)	3.66 (0.000)	3.25 (0.000)	4.27 (0.000)
Glucose intolerance	0.53 (0.572)	2.46 (0.073)	2.07 (0.172)	6.80 (0.001)
Diabetes	5.06 (0.001)	1.62 (0.248)	3.18 (0.000)	5.54 (0.000)
Hypertension	1.85 (0.133)	0.77 (0.431)	1.16 (0.508)	2.01 (0.011)
Coronary artery disease	0.70 (0.544)	1.05 (0.906)	1.33 (0.269)	1.71 (0.079)
Peripheral artery disease	N/A	18.08 (0.011)	1.46 (0.792)	N/A
Pancreatitis	267.63 (0.000)	24.12 (0.007)	40.29 (0.000)	68.47 (0.000)

[CARDIOMETABOLIC RISK AND SEVERE HYPERTG]

SALIVARY PH AS A MARKER OF PLASMA ADIPONECTIN CONCENTRATION VARIATION IN WOMEN

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Aims: Salivary pH is influenced by inflammation, oxidation and numerous oral or systemic factors. Plasma adiponectin is a significant correlate of the pro-inflammatory cardiometabolic risk profile associated with obesity and the metabolic syndrome. The objective of this study is to evaluate the association between salivary pH and plasma adiponectin levels in women.

Methods: The study consists of 156 caucasian women of French-Canadian origin. Multiple regression models were used to evaluate the association between plasma adiponectin concentration and salivary pH. The effect of age, waist circumference, plasma TG, HDL-C, LDL-C, fasting glucose and the menopausal status were considered in the different models tested.

Results: Plasma adiponectin levels increased as a function of salivary pH (p= 0.005). The proportion of variance (R2) of plasma adiponectin explained by the salivary pH was 8% (p< 0.001). The contribution of the salivary pH to the adiponectinemia was significant in both pre- and postmenopausal women (6% and 9%, respectively, p< 0.01) and was independent of the effect of waist circumference and all other studied covariates.

Conclusion: These results suggest that salivary pH (a simple and inexpensive test) is a significant correlate of plasma adiponectin levels in women. The contribution of the salivary pH to variation in adiponectin concentration is independent of obesity and its correlates.

ASSOCIATION BETWEEN HYPERTRIGLYCERIDEMIC WAIST AND 24-HOUR BLOOD PRESSURE AMBULATORY MONITORING PARAMETERS IN HYPERTENSIVE ADULTS

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Objectives: Evidences has shown that altered 24-hour blood pressure circadian rhythm was proxy variables of cardiovascular outcomes. Hypertriglyceridemic waist (HW) phenotype (abdominal obesity and high levels of triglycerides levels) has also been shown as a screening tool to identify subjects with increased cardiometabolic risk. This study investigates HW as predictor of five outcomes of altered 24-hour blood pressure:

1. Positivity for at least three of the following conditions, systolic blood pressure/diastolic blood pressure ≥ 140/90 mmHg, decline in sleep BP, pulse pressure (PP ≥ 53 mmHg),
2. 24-hour pulse pressure (24h PP ≥ 53 mmHg),
3. night-time pulse pressure (night-time PP ≥ 53 mmHg),
4. daytime pulse pressure (daytime PP ≥ 53 mmHg) e 5) decline in night-time BP.

Methods: Cross-sectional study design was conducted in hypertensive outpatients under care. Sample was composed with 116 individuals of both sexes, aged between 29 and 83 years. Hypertriglyceridemic waist phenotype was defined using cut-off points for waist circumference and triglycerides according to NCEP definitions. Poisson regression was used to build multivariate models and estimate prevalence ratio (PR) and CI 95%.

Results: Prevalence of high serum levels of triglycerides and abdominal obesity were 52.0% and 60.3%, respectively. Women shown higher prevalence of waist circumference than men, 65.8% against 36.0% (p< 0,05), while hipertrigliceridemia shown the opposite, men (59.1%) and women (50.5%), no statistical differences. Total prevalence of HW phenotype was 34.4%, 27.3% for men and 35.9% for women, no significant differences. PP24h, daytime PP and nighttime PP were elevated in more than 54% of the studied population and 44% presented higher risk for cardiovascular disease (CVD). HW phenotype and age (over 60 years old) was associated to at least three of 24-hour blood pressure parameters (PR=1.92 and 1.84, respectively); altered daytime PP (PR=1.53 and 1.84, respectively); altered night-time PP (PR=1.78 and 2.24, respectively) and to altered 24h PP (PR= 1.62 and 2.22, respectively).

Conclusions: HW phenotype and age were important factors associated to altered circadian rhythm in hypertensives. These variables when altered or associated to other risk factors have been pointed out as potential tools of screening cardiometabolic risk.

HYPERTRIGLYCERIDEMIC WAIST: NON CONVENTIONAL METABOLIC TRIAD CORRESPONDENT PHENOTYPE AND ITS ASSOCIATED FACTORS IN CARDIOVASCULAR RISK EVALUATION

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Objectives: Until recently, global risk calculators have been taken into account only traditional cardiovascular risk factors, which are recommended in clinical practice, such as age, sex, blood pressure, smoking habits, diabetes and cholesterol serum levels. Hypertriglyceridemic waist (HW) phenotype (abdominal obesity and high levels of triglycerides) has been shown as a simple and helpful predictor of cardiometabolic risk. This study aimed to estimate relationships between this phenotype and other cardiometabolic risk markers such as HOMA-IR, total cholesterol and its fractions, smoking status, body mass index (BMI), age and sex.

Methods: This is a population based cross-sectional study with a sample of 506 individuals, both sexes, aged between 18 and 75 years-old. The studied population is from two communities of a rural area in Brazil. HW was determined by a statistical cut-off point at the fourth quartile of both waist circumference and serum levels of triglycerides. Logistic Regression was used to build the multivariate model, estimate odds ratios and confidence intervals of 95%.

Results: Individuals with the HW phenotype were also hypertensive (78.6%) and hypercholesterolemic (64.3%), presented a positive smoking habit (48.2%) and higher BMI (71.4%), distinguished into overweight (50%) and obese (21.4%) individuals. They also had low levels of HDL cholesterol (55.4%), increased levels of LDL cholesterol (25%), increased levels of fasting glucose (26.8%) and 53.1% had fasting insulin and high HOMA-IR. Multivariate logistic regression show that women (OR = 2.190; CI 95% 1.082 - 4.436), each year of age (OR=1.028; CI 95% 1.006 - 1.052), obesity (OR = 3.607; CI 95% 1.776 - 7.326) and HOMA-IR fourth quartile (OR = 4.528; CI 95% 2.202 - 9.309) were independently associated to HW phenotype.

Conclusion: HW was associated to important markers of metabolic imbalance suggesting this phenotype as discriminant as other metabolic risk calculators and, therefore, could be used as an initial approach to identify individuals with deteriorated cardiometabolic risk markers.

Cardiovascular disease

A 15-YEAR ANTHROPOMETRIC CHANGES AND THE ASSOCIATION OF CVD MORTALITY IN TAIWAN

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Objective: To compare body mass index, waist circumference, and waist-to-hip ratio in the all cause and cardiovascular disease mortality in a large cohort followed for 15 years.

Method: The cohort consisted of 449,649 individuals aged older than 20 years who participated in a standard medical screening programme since 1994 to 2008. We estimated national prevalence in Taiwan from the cohort by adjusting age. Hazard ratios (HRs) were calculated with Cox proportionate hazards model. In Taiwan, overweight and obesity for general obesity was defined by body mass index (BMI ≥ 24 and 27 kg/m², respectively). And the abdominal obesity were defined as waist circumference $\geq 90/80$ in men/women; and the waist-to-hip ratio (WHR) were defined as $\geq 0.90/0.85$ in men/women.

Result: We calculated the means of BMI, waist circumference and waist-to-hip ratio changes with different age group. The BMI and waist circumference increase with age were more prominent in women than in men. The prevalence of overweight & obesity defined by BMI cut-off points 24 & 27 kg/m² are 43.9 & 16.5 % in men, and 18.4 & 11.4 % in women. The waist circumference increasing with age both in men and women, the prevalence that waistline over 90/80 cm in men and women are 22% and 21%, respectively. Prevalence of WHR higher than 0.9/0.85 in men and women are 33.1% 14.9%.

The CVD mortality risks were significantly increased in the following cut-offs: BMI higher than 24 kg/m², waistline higher than 90/80 cm and waist-to-hip ratio higher than 0.9/0.85 in men/women. The Hazard Ratios (HR) were significant in both gender groups: the HR of CVD was between 1.24-1.31 in men, and 1.17-1.28 in women, comparing with the normal range of BMI.

Conclusion: Mortality risks differed using one of the three indices for abdominal obesity. Their strengths and weakness will be compared and presented, particularly for Asian population.

CAROTID INTIMA-MEDIA THICKNESS AND SERUM ENDOTHELIAL MARKERS LEVELS IN OBESE CHILDREN WITH METABOLIC SYNDROME

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Objective: To study the changes of carotid intima-media thickness (IMT) and serum endothelial markers levels in obese Chinese children.

Methods: A total 131 obese children, including 29 with metabolic syndrome (MS group) and 102 without metabolic syndrome (obese group), and 31 non-obese children (control group) were enrolled. The serum von Willebrand factor (vWF), thrombomodulin (TM), Triglyceride (TG), total cholesterol (TC), high density lipoproteins-cholesterol (HDL-C), low density lipoproteins-cholesterol (LDL-C), apolipoprotein (Apo) A1, ApoB, fasting insulin (FI), alanine aminotransferase (ALT), IMT, waist-to-hip ratio (WHR), and systolic blood pressure (SBP) were measured. Body mass index (BMI) and homeostasis model assessment of insulin resistance (HOMA-IR) were calculated.

Results: Compared with the controls, higher IMT and vWF levels were found in obese children (all $P < 0.05$). The vWF levels in obese, MS and control groups were 2.08 ± 0.78 , 2.42 ± 0.98 and 1.54 ± 0.48 IU/ml with a significant difference ($P < 0.001$) while the difference of TM levels was not significant ($P = 0.380$). Meanwhile, the IMT in obese, MS and control groups were 0.67 ± 0.12 , 0.74 ± 0.17 , and 0.37 ± 0.08 mm respectively, with a significant difference ($P < 0.001$). Significant correlations between mean IMT and age, BMI, WHR, SBP, HDL-C, LDL-C, Log(TG), Log(FI), Log(HOMA-IR), Log(ALT), TC, vWF, apoB/apoA1 (all $P < 0.05$) were noted. Stepwise multiple regression analysis showed that BMI, WHR, vWF and Log(TG) were independent determinants of IMT.

Conclusions: These results that serum vWF level and IMT increased in obese children with MS suggest endothelial injury in obese children. Serum vWF level and IMT can be used to identify the degree of endothelial damage.

OBESITY AND THE RISK OF CARDIOVASCULAR DISEASES IN A LARGE CHINESE POPULATION

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Aim: To assess which obesity index, BMI, waist-to-hip ratio or waist circumference, is most closely associated with cardiovascular diseases.

Methods: We conducted a cross-sectional health survey of 19,9669 participants aged ≥ 20 years in Baoshan and Luwan District, Shanghai. Cardiovascular diseases included self-reported stroke, myocardial infarction and coronary heart disease.

Results: The prevalence of cardiovascular diseases was 9.65% in 19,9669 participants. BMI showed a dose-dependent relationship with cardiovascular diseases (OR: 2.18, 95% CI: 1.90-2.49 top quartile versus bottom quartile) before adjustments. Although the magnitude of the association reduced substantially (1.73, 1.42-2.11, top quartile versus bottom quartile) after further adjustments for waist-to-hip ratio, it still remained significant. As for waist-to-hip ratio and waist circumference, they both related to the prevalent cardiovascular diseases in a positive and significant manner (2.19, 1.84-2.60; 2.42, 2.03-2.88 top quartile versus bottom quartile, respectively) before adjustments, but the association was eliminated after further adjustments for BMI.

Conclusion: BMI showed a graded and significant relation with cardiovascular diseases independent of index of central obesity (waist-to-hip ratio) in Chinese population.

DOES OBESITY MODIFY THE EFFECT OF BLOOD PRESSURE ON THE RISK OF CARDIOVASCULAR DISEASE? KOREAN CANCER PREVENTION STUDY

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Background: Obesity is associated with diverse health risks, but the role of body weight as an effect modifier for the association between blood pressure and the risk of cardiovascular disease (CVD) remains controversial. Given the inconsistency of this result, we tested it using a large population based cohort study.

Methods: Systolic and diastolic blood pressures (BPs) and body mass index were measured in 1,243,443 Koreans between the ages of 30 and 95 years who had undergone one biennial medical evaluation through the National Health Insurance Corporation between 1992 and 1995. Hazard ratios (HRs) per 1-SD increase in systolic and diastolic BP were computed within established body mass index categories (underweight, normal, overweight, or obese) with Cox proportional hazards models.

Results: During the follow-up, which lasted until the end of 2006, 114,705 new CVD events took place, including 12,636 myocardial infarctions and 53,802 strokes. In men, the associations of systolic BP with CVD (HR 1.32), myocardial infarction (HR 1.28), and stroke (HR 1.41) were observed in the obese category. For diastolic BP, the associations were observed in the obese category with CVD (HR 1.31), myocardial infarction (HR 1.39), and stroke (HR 1.41). Overall the associations were similar according to obesity categories. There were strong combined effect of blood pressure and body mass index on risk of CVD in both men and women.

Conclusions: We observed similar magnitude of the associations between blood pressure and subsequent CVD with increasing body mass index. Hypertension should not be regarded as an effect modifier on the association between blood pressure and the risk of CVD.

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IMPACT OF ANTIOXIDANT (VITAMIN E) ON SERUM CHOLESTEROL LEVEL IN POSTMENOPAUSAL WOMEN

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The present study entitled as "Effect of Vitamin E supplementation on lipid profile of post menopausal women" was done in laboratory of Faculty of Health and Medical Sciences of Allahabad Agricultural Institute Deemed University-Allahabad. Total 50 Hyperlipidemic post menopausal women were selected with their consent from 5 different hospitals in Allahabad, to assess the impact of intake of antioxidant vitamin E on lipid profile. The selected sample was randomly divided in 2 groups of 25 women in each as Group -I (control group) and Group-II (test group). Group - II (test group) were administered antioxidant vitamin E as vitamin E acetate (100mg/day) for period of 4 weeks. During the study blood sample of both groups were

analyzed for lipid profile tests including-Total cholesterol, triglycerides, HDL cholesterol and LDL cholesterol. Total cholesterol and LDL cholesterol were significantly decreased in group II as compare to control group I where as HDL was significantly increased in group II as compare to group I. Serum triglycerides level is significantly decreased in group II as compare to group I. These finding indicate the beneficial effect of vitamin E as food in synthetic form. Due to antioxidant property vitamin E lower the lipid profile in post menopausal women, which is a leading cause of coronary artery disease in post menopausal women.

ASSOCIATION BETWEEN ACUTE MYOCARDIAL INFARCTION, BMI AND CHRONIC DENTAL DISEASES

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Introduction: In patients with cardiovascular diseases several risk factors such as high blood pressure, BMI, diabetes, smoking, genetic disposition or chronic inflammation must be considered. The aim of this study was to investigate whether there is a correlation between infections of dental origin, BMI-values and the presence of an acute myocardial infarction (AMI).

Methods: A total of 125 patients having suffered from a myocardial infarction and 125 healthy individuals were included in this study. The oral examination was carried out following the consent of the ethics committee and the National Board for Radiation Protection and included the number of teeth, endodontically treated teeth, Periodontal Screening Index (PSI), clinical attachment level (CAL) and radiographic apical lesions (radiograph examination). The medical examination included amongst others BMI, blood glucose level, C-reactive protein (CRP) serum levels and leukocyte number.

Results: The study demonstrated that patients with acute myocardial infarction showed in comparison to the healthy controls an unfavorable general and dental state of health with a BMI of 29 (control: 24) and diabetes in 16% (control: 5%). After the statistical adjustment for age, gender and smoking they showed a significantly higher number of missing teeth ($p=0.001$), significant higher BMI ($p=0.001$), a higher number of radiological apical lesions ($p=0.001$) and a higher PSI value ($p=0.001$) compared to individuals without myocardial infarction. In the AMI patients no statistically significant correlation could be found between BMI and chronic dental diseases (AMI patients: missing teeth: $p=0.725$; control: $p=0.964$).

Conclusions: This study demonstrates that AMI patients suffer from both a poor general health and an unfavourable dental state of health when compared to the healthy controls. As a single variable the BMI showed no correlation to dental conditions.

COMPARISON OF OBESITY MEASUREMENTS AS PREDICTORS OF CARDIOVASCULAR EVENTS IN CHINESE

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Objectives: Obesity is a major risk factor for cardiovascular disease, but the most predictive measure for different ethnic populations is not clear. We aimed to compare the association of waist-to-hip ratio (a marker of central obesity) and body-mass index (BMI, a marker of general obesity) with risks of cardiovascular events.

Methods: 9,219 residents aged 40 years or older from Shanghai Bao-Shan District were recruited in 2004 when baseline examinations were carried out. In 2007, these same subjects were invited for a follow-up questionnaire. Cardiovascular events were reported and they were defined as non-fatal myocardial infarction, non-fatal stroke or cardiovascular death.

Results: 7,888 subjects participated in the follow-up questionnaire. During 22,221 person-years' follow-up, 155 incident cases of cardiovascular events were reported and confirmed. BMI showed a modest association with cardiovascular events (HR 1.38, 95% CI 1.09-1.75 top quartile vs bottom quartile; P for trend < 0.01 [adjusted for sex, age, smoking, systolic blood pressure]), which was nearly unchanged after adjustment for waist-to-hip ratio (1.37, 1.08-1.74; P for trend < 0.01). Waist-to-hip ratio was associated with risk of cardiovascular events (1.27, 1.09-1.50 top vs bottom quartile), however, the association no longer remained significant after further adjustment for BMI (1.15, 0.96-1.38).

Conclusions: BMI rather than waist-to-hip ratio appears to be the more appropriate measure of obesity to predict cardiovascular events in an adult Chinese population.

APPROPRIATE CUT OFF VALUES OF ANTHROPOMETRIC VARIABLES TO PREDICT CARDIOVASCULAR OUTCOMES: 7.6 YEARS FOLLOW UP IN AN IRANIAN POPULATION

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Objective: To determine cutoff points of anthropometric variables for predicting incident cardiovascular disease (CVD) in Iranian adults.

Design: Population based longitudinal study.

Methods: 1614 men and 2006 women, aged ≥ 40 years, free of CVD at baseline were followed over a median of 7.6 years. Body mass index (BMI), waist circumference (WC), waist to hip ratio (WHR), waist to height ratio (WHtR) and cardiovascular risks were assessed. The adjusted hazard ratios (HRs) for CVD were calculated for 1 SD change in all obesity variables using Cox proportional hazards regression analysis. Receiver operator

characteristic (ROC) curve analysis was used as the method of defining the points of the maximum sum of sensitivity and specificity (MAXss) of each variable as a predictor of CVD.

Results: We found 333 CVD events during follow up. The risk factor adjusted HRs were significant for all anthropometric variables in males and WHR in females and were 1.19, 1.24, 1.21 and 1.24 for BMI, WC, WHR and WHtR in males and 1.27 for WHR in females, respectively (all $p < 0.05$). ROC analysis showed the highest area under curve (AUC) for WHR, WHtR and WC, followed by BMI in males and both genders aged ≥ 60 years. In females, WHR and WHtR had the highest AUC, followed by WC and BMI. Among those >60 years elderly, all the anthropometric variables showed same CVD predicting power. The cut off values (MAXss) for CVD prediction in males and females were; BMIs 26.95 and 29.19 kg/m^2 , WCs 94.5 and 94.5 cm, WHRs 0.95 and 0.90, and WHtR 0.55 and 0.62, respectively. As a public health priority we also preferred to cover a reasonable proportion of the population at risk and not to miss more than 20% cases of incident CVD (i.e. predefined sensitivity of at least 80%) in identifying the cutoff point of each anthropometrics. As expected, lower cut-off points of anthropometric variables with lower specificities were produced.

Conclusion: There was no difference between central obesity variables in predicting CVD in males, whereas in females WHR and WHtR were more appropriate. The cutoff values of anthropometric variables were higher in the Iranian than other Asian populations.

METABOLIC SYNDROME AND CARDIOVASCULAR DISEASE OUTCOME: 8 YEARS FOLLOW UP IN AN IRANIAN POPULATION

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	Hazard Ratio (95% CI)	P	C Index	Deviance† (-2 log likelihood)	AIC†
Men					
IDF defined MetS	1.83 (1.41-2.37)	<0.001	0.706	3432	3446
ATPIII defined MetS	2.01(1.54-2.62)	<0.001	0.710	3426	3439
Women					
IDF defined MetS	1.66 (1.24-2.22)	0.001	0.709	2774	2787
ATPIII defined MetS	2.06 (1.47-2.89)	<0.001	0.720	2766	2780

[Metabolic syndrome as predictor of CVD event]

Aims: Data on the prospective effects of metabolic syndrome (MetS) on cardiovascular disease (CVD) prediction are limited in Middle East countries. We compared the predictive power of the ATPIII and International diabetes Federation (IDF) definitions of MetS for incident CVD among men and women.

Methods: In this population based longitudinal study 2027 men and 2653 women, aged ≥ 40 years, free of CVD at baseline were followed over a

median of 8 years. Prevalence of MetS was assessed at baseline using the Iranian central obesity cut-points. The adjusted hazard ratios (HRs) for CVD were calculated for both the ATPIII and the IDF defined MetS using Cox proportional hazards regression analysis adjusted for age, smoking, education, family history of premature cardiovascular disease and intervention group. We assessed the deviance and Akaike's information criteria (AIC) as indicators of goodness of fit of the predictive models. A lower value of deviance and AIC indicate a better model fit.

Results: We found 243 and 188 CVD events during follow up in men and women, respectively. The two MetS definitions had 67% concordance in classifying subjects. In both genders, risk factor adjusted HRs for both MetS definitions were significant showing same overall predictive discrimination (as judged by C statistics); However, the ATPIII definition of MetS had better fitted models (as assessed by deviance and AIC) than IDF.

Conclusion: In Iranian men and women, both MetS definitions yield independent prognostic information with the same predicting power of CVD even after risk factor adjustment; although, ATPIII definition of MetS resulted in a more fitted predictive model than the IDF definition.

Childhood obesity

ASSOCIATION OF MEASURES OF CENTRAL OBESITY WITH HIGH BLOOD PRESSURE IN INDO ASIAN GIRLS

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Childhood obesity is a known determinant of high blood pressure. Studies in Indo-Asian adults suggest amore important role of central than overall obesity on cardiovascular disease.

Objective: To investigate the relationship between obesity measurements with systolic blood pressure (SBP) in school aged Indo Asian girls.

Methods: We performed a cross-sectional analysis of data obtained on girls aged 9-11 yrs old girls from 4 conveniently selected public sector schools in Karachi. Information on Sociodemographic factors were recorded. Body mass index (BMI), waist circumference (WC), triceps skinfold (TSF), subscapular skinfold (SSF) and midarm circumference (MAC) and SBP were measured. Primary outcome measure was SBP. Secondary outcome was a composite of children with hypertension (SBP >95 th percentile for gender, age, and height) and those with high normal blood pressure (SBP levels of >90 th percentile but < 95 th percentile for gender, age, and height).

Results: Out of the 360 participants, 298(87.2%) consented to enroll. Data was analyzed for 275 who fulfilled the inclusion criteria. The mean age was 10.29 ± 0.77 yrs. About 45(19.7%) had hypertension and 27(11.8%) had high normal blood pressure. On univariate regression analysis SBP was related to age ($p < 0.001$), WC ($p < 0.001$), TSF ($p 0.006$), SSF ($p < 0.001$), body mass index (BMI) ($p < 0.001$) and MAC ($p < 0.001$). On multivariate analysis only WC ($\beta = 0.35$, 95% CI [0.13, 0.57]) and SSF ($\beta = 0.74$, 95% CI [0.02, 1.45]) were associated with SBP. The results on analysis of secondary

outcome were consistent. WC was the only factor independently associated with hypertension (OR 1.06 95%CI [0.99,1.14]).

Conclusion: Waist circumference and SSF have stronger association with SBP than other indices of obesity in Indo Asian girls including BMI.

ABDOMINAL OBESITY, AMONG THE 13-14 YEAR OLD CHILDREN, IN ALBANIA

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Objectives: The purpose of this study was to assess the prevalence of overweight and obesity among the 13-14 year old children, in Vlora city, Albania, between years 2003-2007.

Methods: We have anthropometrically measured and analysed 504 children, 270 females and 234 males. All these children filled in detailed forms where we gathered the important data that defined the bodily weight indicator.

Results: According to the results of this study 20% are underweight, 47% normal, 32% are overweight and 15% are obese. We have chosen students from public and non public schools, from the city and the villages and from different areas of Vlora to make the study as objective possible.

Conclusions: In the 13-14 year old children, females tend to be healthier than males. The number of members in a family doesn't influence the change of bodily weight indicator ($p > 0.05$). The parents' education compared to underweight children ($p < 0.05$). Underweight children with a working person in the family ($p < 0.05$) preferred products are those that contain high levels of carbohydrates ($p < 0.05$). Animal derived products consumed don't explain the changes of bodily weight indicator ($p > 0.05$). From this observation it can be seen that overweight is genetically transmitted ($p < 0.05$).

Overweight children consume less salty food compared to the underweight children ($p > 0.05$). Underweight children use more medications compared to the overweight children ($p < 0.05$). Physical activity was found to be low.

Keywords: Obesity, Body mass index, Overweight children.

WAIST CIRCUMFERENCE AS AN INDICATOR OF HIGH BLOOD PRESSURE IN PRESCHOOL OBESE CHILDREN

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Objective: To determine the prevalence of high blood pressure in a representative sample of 3- to 6- year-old preschool normal weight, overweight and obese children, and to investigate the relationship between waist circumference and BP, whether as a indicator of high blood pressure in this age population.

Methods: The body weight, height, waist circumference, hip circumference, and blood pressure of 939 3-6-year-old preschool children (271 obese, 139 overweight, 529 normal weight) were collected.

Results: Systolic BP and diastolic BP in obese children were significantly higher than that in normal weight children in both sexes ($p < 0.001$). Overweight children have significantly higher systolic and diastolic BP than normal weight children in boys ($p < 0.01$). The prevalence of high blood pressure in the overall group of 939 children was 23% ($n=216$). A significant difference between normal weight (boys, 17.5%; girl, 14.2%) and obese children (boys, 38.5%; girl, 33.6%) was observed for both sexes ($p < 0.01$). BMI age- and sex-adjusted correlated significantly with SBP and DBP. In the children aged 3-6 years, WC age-, sex- and BMI-adjusted correlated significantly with SBP, but not with DBP. WC age-, sex- and BMI-adjusted correlated significantly with DBP, but not with SBP in the children aged 3-4 years. Receiver operating characteristic (ROC) curves showed a significant ability of BMI [area under the curve (AUC) 0.663 for girls and 0.62 for boys], waist circumference [AUC 0.622 for girls and 0.580 for boys] and WtHr [AUC 0.647 for girls and AUC 0.631 for boys], to discriminate high blood pressure children of both sexes. Multiple linear stepwise regression analysis using SBP as the dependent variable showed that BMI and WC was significant independent influence factors for high blood pressure adjusted for age, sex, WtHr and WHr. When using DBP as the dependent variable, BMI, WC and WtHr were the significant independent influence factors for high blood pressure adjusted for age, sex and WHr.

Conclusion: Waist circumference was independently associated with high blood pressure in the children aged 3-6 years. In addition to BMI, increased waist circumference is a indicator of high blood pressure in the preschool age group.

LEPTIN AND ADIPONECTIN LEVELS IN PUBERTAL CHILDREN: RELATIONSHIP WITH ANTHROPOMETRIC VARIABLES AND BODY COMPOSITION

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Objective: The aim of this study was to determine serum leptin and adiponectin levels in a population-based sample of Spanish pubertal children and evaluate their association with anthropometric parameters and body composition.

Design and measurements: This cross sectional study included 833 pubertal boys and girls. Serum leptin and adiponectin levels in each child were determined by ELISA. Anthropometrical data were measured and body mass index (BMI) and waist to hip ratio calculated. Body composition was assessed using an impedance body composition analyzer.

Results: Serum leptin concentrations were significantly higher ($P < 0.0001$) in obese or overweight (OW) boys and girls than in those having normal weight (NW). Serum adiponectin levels were significantly lower ($P < 0.01$) in obese or OW girls than in NW girls, though the same was not true in boys. A comparison of data according to leptin and adiponectin tertiles revealed that weight, BMI, waist circumference, hip circumference, fat mass and % fat mass increased significantly ($P < 0.0001$) according to leptin tertiles in both genders. Correlation of leptin levels with fat mass and % fat mass was strong. The association of adiponectin tertiles with anthropometric variables

was weaker in both genders. No differences were found in fat mass or % fat mass across adiponectin tertiles.

Conclusions: Our study confirmed that, in pubertal children, leptin correlates with weight, BMI, waist circumference and hip circumference and correlates even more strongly with % fat mass. On the other hand, however, the correlation of adiponectin with anthropometric variables is weaker and adiponectin levels are not correlated to body fat.

EFFECTS OF AN EDUCATIONAL INTERVENTION PROGRAM ON WEIGHT CONTROL IN OVERWEIGHT AND OBESE CHILDREN

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Objectives: The aim of this preliminary study was to evaluate the effects of a short-term (2 months) nutrition and physical activity intervention program on weight control addressing overweight and obese school children aged 6-11 years. The program was planned to be integrated to the national primary school program and if successful, to become a model for a nationwide intervention program.

Methods: This study was conducted in four primary schools in Istanbul. First an informative meeting was held with the parents and their written consent was obtained. Parents filled out a questionnaire regarding their children's nutritional and physical activity habits, including a three day dietary history form. Physical examination and anthropometric measurements were conducted on 1169 children. The measurements were taken with standard methods, fat ratios were measured with bioelectric impedance (Tanita). Out of 1169 children, 224 participated in an interactive program under the Istanbul Faculty of Medicine, Pediatric Endocrinology Department for 2 hours a week, 8 weeks in total. Four months later repeat anthropometric measurements were taken in 130 children (45 F, 85 M). The SPSS program was used in the analysis of the results.

Results: Of a total of 1169 children, 24.2% were overweight and 9.7% were obese. Overweight ratio was 22% among girls and 26% among boys. Obesity ratio was 5.5% among girls and 13.3% among boys. Four months after the initiation of the intervention program, weight SDS, BMI SDS, fat ratio and fat mass values decreased significantly in the intervention group ($p < 0.001$). Waist circumference also showed a significant reduction in obese children. No significant changes were noted in the measurements of children who did not join the intervention program.

Conclusions: This study showed that an educational intervention program on diet and physical activity addressing obese and overweight children aged 6-11 years was effective. Considering the rapid increase in the prevalence of obesity, it was concluded that the integration of a similar educational program to the national primary school education programs would be an effective way to prevent obesity, particularly in urban settings.

THE CHANGES OF SUBCUTANEOUS ADIPOSE TISSUE TOPOGRAPHY (SAT-TOP) IN NORMAL-WEIGHT AND OVERWEIGHT JUVENILES DURING PUBERTY - A LONGITUDINAL STUDY

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Childhood obesity has been dramatically increased during the last decades. Juvenile obesity is a strong risk factor for obesity in adulthood. Data showing subcutaneous adipose tissue topography (SAT-Top) renders information about the risks to develop type 2 diabetes, coronary heart disease and fertility disorders. SAT-Top was measured in 48 girls and 40 boys aged between 11 and 14 years over four consecutive years with the Lipometer, an new TÜV-certificated optical measurement system. The Sat-Top profile of the measured person is like an individual "fingerprint", formed by genetics, sex, age and life style.

The normal weight girls increased adipose tissue layers between 11 and 14 years especially at the thigh, the normal weight boys decreased adipose tissue layers in this age range on their extremities. The variation of the subcutaneous adipose tissue distribution at different age groups was erratic. The girls develop a body-silhouette more similar to a "pear".

The obese children showed tremendous changes in the distribution of the subcutaneous adipose over the measured 4 years, which eventually points out life-style intervention and fluctuating hormonal imbalance during puberty. Factor analysis condenses the 15 body sites to a two dimensional plot. The SAT-Top development is clearly shown for the subsequent age groups. The positions of obese girls and boys were found in an area of high-risk adults with a manifested metabolic (type 2 diabetes, TDM2, metabolic syndrome), coronary heart disease (CHD) or female subfertility (polycystic ovary syndrome PCOS). The obese juveniles have especially on their trunks thick adipose tissue layers.

In the context of this study it was also visible that very lean juveniles with massive sportive activity have very thin subcutaneous adipose tissue layers.

HSCRIP IN OBESE CHILDREN AND ADOLESCENTS - CLINICAL CORRELATION WITH METABOLIC SYNDROME

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Childhood obesity is an increasing problem through out the world. The aim of this study was to examine the level of hsCRP and its possible correlation with metabolic syndrome in a prospective cohort of obese children and adolescents admitted in the clinic of pediatric endocrinology, diabetes and clinical genetics, Pediatric University Hospital, Sofia in one year period (March 2008-January 2009).

Materials and methods: In 62 obese patients aged 11.77±2.88 (5-17 yr) were measured - height, weight, BMI, waist circumference, hip circumference, waist/hip ratio, blood pressure, acanthosis nigricans. It was performed OGTT and examined the levels of hsCRP, total cholesterol, Tg, HDL-cholesterol and LDL-cholesterol.

Results: Metabolic syndrome was established in 21% of the patients, 6 males-23 %, and 7 females- 19.4 % (out of 62 obese patients, 26 males and 36 females). Arterial hypertension was established in 40.32% of the patients (25 of 62 patients). There was no deference in hsCRP levels depending on the gender, stage of pubertal development and presence of metabolic syndrome. There was dependence between hsCRP and duration of obesity but statistically not significant. hsCRP>3 mg/dl was statistically more often in children with impaired glucose tolerance and hyperinsulinism ($p < 0.05$). There was a positive correlation between level of hsCRP>3 mg/dl and risk of developing metabolic syndrome and arterial hypertension ($p < 0.01$).

Conclusion: Metabolic syndrome is often diagnosed in obese children more frequent in boys. There was correlation between level of hsCRP and duration of obesity although insignificant, as well as between level of hsCRP>3 mg/dl and risk of metabolic syndrome and arterial hypertension.

EIGHT DAY OBESITY CAMP REDUCED INSULIN RESISTANCE, BLOOD LIPIDS LEVELS AND VISCERAL FAT

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Objectives: The purpose of this study was to examine the effects of 8 day intense lifestyle modification on insulin resistance, visceral adiposity and cardiovascular disease (CVD) risk factors in 11-13 year old obese children.

Methods: A total of 57 obese children (38 boys, 19 girls, Age: 12.04±0.83 years, BMI :26.49±3.20kg/m²) participated in the current study and were housed together for the period of study. The intense lifestyle modification included physical activities (1700kcal/day), controlled nutrition consumption (2000kcal/day), education program and a behavior modification. Weight, body mass index (BMI), abdominal fat, visceral fat, CVD risk factors, aspartate aminotransferase(AST), alanine aminotransferase (ALT), gamma glutamyl transferase(GGT), and high sensitivity C-reactive protein(hs-CRP) were measured before and after the intervention.

Results: After 8 day-camp, body weight (pre: 61.0±9.81 kg, post 58.48±9.48 kg), BMI (pre: 26.5±3.2kg/m², 25.3±3.1kg/m²), total abdominal fat (pre: 29361±8279mm², post: 27465±8230mm²), visceral fat (pre: 7383±2798mm², post 6409±3103 mm²), waist circumference (pre: 84.3±9.2cm, post: 81.1±8.7cm) ($p < .001$), and mean arterial pressure (pre: 86.0±9.6mmHg, post: 81.9±7.8mmHg) ($p < .01$) were significantly improved. In addition, total cholesterol (pre: 172.2±31.2mg/dl, post: 142.4±25.8mg/dl), triglycerides (pre: 126.3±51.1mg/dl, post: 34.6±11.8mg/dl), insulin(pre: 13.7±6.7μU/ml, post: 3.5±1.9μU/ml), homeostasis of insulin resistance (HOMA-IR) (pre: 2.60±1.3, post: 0.66±0.4), hs-CRP (pre: 0.161±0.17mg/dl, post: 0.096±0.09mg/dl) and GGT (pre: 22.82±10.07U/L, post: 18.91±7.15U/L) ($p < .001$) levels significantly reduced after the intervention.

Conclusions: In summary, the relatively short-term intense lifestyle modification camp had beneficial effects on obesity, and CVD risk factors in obese children and improved insulin resistance and cardiovascular risk factors are may be due to changes in visceral adipose tissues after the intervention.

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THE RELATIONSHIP BETWEEN NONALCOHOLIC FATTY LIVER DISEASE AND CARDIOVASCULAR DISEASE IN OBESE CHILDREN

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Objective: To investigate the relationship between Nonalcoholic Fatty Liver Disease and Cardiovascular Disease in obese children.

Methods: 59 obese children aged from 7 to 14 years were enrolled and 24 non-obese children with neither abnormal hepatic sonograms changes nor elevated AST or ALT were set as control. Body mass index (BMI), serum triglyceride, Blood Pressure, B-ultrasound hepatic, ALT, AST, carotid artery intima-media thickness (IMT), free insulin were detected in this cohort. Two subgroups were selected according to the diagnosis criteria: Group1: OCWLD (obese children without liver disorder) group, 41 cases; Group2: NAFLD (Nonalcoholic Fatty Liver Disease) group, 18 cases. The incidence of hyperlipidemia and hypertension, carotid artery intima-media thickness (IMT) and other chemical indicators were compared in these three groups. The relationship between nonalcoholic fatty liver disease and cardiovascular disease were analyzed in obese children.

Results: Forty-one children diagnosed as NAFLD showed significantly greater carotid IMT (0.96mm±0.1mm) than 18 OCWLD subjects (0.57mm±0.1mm) and 24 control subjects (0.37mm±0.08mm), ($p < 0.05$). NAFLD group had a higher incidence of hyperlipidemia and hypertension as compared with that of 18 OCWLD subjects and 24 control subjects ($p < 0.05$). By bivariate analyzed, IMT was correlated well with ALT, AST, triglyceride, free insulin ($r_s = 0.623, 0.460, 0.529, 0.652, P < 0.001$).

Conclusions: NAFLD is likely to be associated with increased CVD risk, and NAFLD in obese children may be not only a marker but also an early mediator of CVD.

GREATER TOTAL FATNESS AND ABDOMINAL DISTRIBUTION OF BODY FAT IN TALLER VERSUS SHORTER OVERWEIGHT AND OBESE CAUCASIAN CHILDREN

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Aim: To investigate the relationships between childhood height for age and measures of general and abdominal adiposity.

Methods: 2298 Caucasian children aged 5-14 years were studied. Height, weight, percentage body fat (%BF, bioelectrical impedance analysis) and waist circumference (WC) were measured. Body mass index (BMI) was derived and all measures converted Z-scores using UK reference data. Children were divided into quartiles of height Z-score and 1-way ANOVA used

to compare variables between quartiles and the prevalence of overweight/overfat/obesity/abdominal obesity within each quartile was determined. A trend analysis using polynomial contrasts then compared mean BMI, %BF and WC Z-scores within overweight/obese, overfat/obese and abdominally obese children across quartiles of height Z-score.

Results: A significant increase in mean BMI-, %BF- and WC-Z-scores with increasing quartile of height Z-score was observed ($P < 0.001$). This significant rising trend was replicated within the overweight/obese, overfat/obese and abdominal obese children ($P < 0.02$ - $P < 0.001$). Prevalence of overweight/obesity, overfat/obesity and abdominal obesity followed a similar pattern, with prevalence being lowest in the bottom quartile (8-13%) and highest in the top quartile of height for age (33-52%).

Conclusion: This study confirms a higher prevalence of excess weight (BMI) among children tallest for their age. This study now extends this observation to a higher prevalence of both excess total and abdominal fat amongst the tallest group. Furthermore, within overweight/obese, overfat/obese and abdominally obese children, the taller the child was for their age, this accumulation of excess total and abdominal fat was amplified, compared with equivalent children who were shorter for their age. These findings suggest that being tall for age is not only a risk factor for general overweight/obesity in children, but particularly for abdominal obesity. This is especially concerning since excess abdominal fat accumulation is strongly linked to risk for type 2 diabetes and cardiovascular diseases, and a number of other health issues. Why tallness for age is associated with greater body fat accumulation is unclear at this stage but greater attention should be paid to height for age in children as a tool for predicting children who may be at greater risk of general and abdominal obesity.

A QUALITATIVE ASSESSMENT OF FAMILY PERSPECTIVE ON ADDRESSING OVERWEIGHT IN HISPANIC CHILDREN - A TWU-DENTON COMMUNITY PROJECT

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Objectives: Latinos represent 14% of the US population and are the group with the highest prevalence of adult obesity and overweight. In the USA, the percentage of overweight children has more than doubled in the past 20 years. Children who are overweight have a greater risk of being overweight and being in poor health as adults. The purpose of this study was to understand the customs and beliefs of Mexican-American parents regarding childhood health and body image.

Methods: The Nutrition Department at Texas Woman's University (TWU) in conjunction with senior Hispanic church leaders formed focus groups with parishioners to address key issues on childhood obesity. The audio tapes for all focus groups were recorded and were translated and analyzed in a laboratory setting. The average age of the mother was 36.4 years ($n=17$) and the father 46.4 years ($n=15$). Families had an average of 2.4 children ranging in age from 4 months to 18 years old. Children brought to the focus group were provided childcare during the session. For analysis we followed a validated method that involved six steps of analysis to obtain qualitative data.

Results: After analysis, twenty themes emerged. These were clustered into five domains; barriers to healthy nutrition and exercise, parental challenges and concerns, definition of healthy child, successful strategies to treat and prevent childhood overweight and program suggestions.

Conclusions: This study of parental attitudes and concerns corroborates previous studies and contributes some new information about the needs of the Hispanic community. Parents reported early childhood obesity related to feeding practices, and eating in the absence of hunger. School nutrition was reported by parents as a focal point for intervention. This research enriches program development on a deeper cultural level by suggesting beliefs, attitudes, and knowledge that should be targeted in program development. As indicated by this preliminary study, the church environment may become a useful colleague in future programs as it provides a safe and comfortable environment.

ABDOMINAL OBESITY AND ITS HEALTH CONSEQUENCES AMONG URBAN AFFLUENT ADOLESCENTS IN INDIA

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Aims: To examine prevalence of overweight, abdominal obesity and high blood pressure among urban affluent adolescents in Pune, India.

Methods: School children ($n=867$) in the age group 9 to 16 yr from high socioeconomic class in Pune city were measured for weight, height, body mass index (BMI), body fat, waist and hip circumference and blood pressure using standard procedures.

Results: Prevalence of overweight based on International Obesity Task Force cut off was as high as 24.1%. Mean waist circumference (WC) as well as waist-hip ratio (WHR) increased with increase in BMI and body fat %. Mean systolic and diastolic blood pressure (SBP and DBP) levels increased significantly ($p < 0.01$) from lower tertile to higher tertile for each of the indicators i. BMI, body fat and WC. The odds ratio (OR) for risk of high SBP (HSBP) was significant (2.43, $p < 0.01$) for children in highest tertile of BMI after adjusting for age and WC. In contrast, in case of WC (after adjusting for age and BMI) significant OR (1.88, $p < 0.01$) was seen for children in the middle tertile as well as for children in highest tertile 2.23, $p < 0.01$. Prevalence of HSBP increased significantly above 75th percentile of WC as well as WHR.

Conclusion: Abdominal obesity as assessed by WC or WHR increased with over all adiposity. Further, it conferred greater risk for HSBP compared to overall adiposity as assessed by BMI. Abdominal obesity thus reveals health consequences even among children.

WAIST-TO-HEIGHT RATIO ASSOCIATION WITH ADDITIONAL CARDIOVASCULAR RISK FACTORS IN CHILDREN AND ADOLESCENTS - THE THREE CITIES HEART STUDY

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Objective: To determine in children and adolescents, which is the best anthropometric index among body mass index (BMI), waist circumference (WC), waist-to-hip ratio (WHR) and waist-to-height ratio (WHtR) in relation to metabolic, clinical and lifestyle variables for ischemic cardiovascular diseases.

Methods: Cross-sectional study, school-based study in three large cities, Brazil, with a sample of 3179 students, aged 6 to 18 years randomly selected from public and private schools, who completed the study.

Results: The prevalence rates for overweight and obesity were 10% and 5%, respectively. In relation to the students in the lower quartile (Q1) of the distribution of subscapular skinfold, the students in the upper quartile (Q4) presented a 2.0 times higher risk (odds ratio) of having elevated TC levels. Overweight and obese students had a 3.3 times higher risk of having elevated systolic blood pressure, and a 1.9 times higher risk of elevated diastolic blood pressure when compared to normal weight students. The less active students presented a 1.58 times higher risk of having waist-to-stature ratio above the upper thirteenth (Q3).

The optimal cutoff point values of the anthropometric indices BMI, subscapular, suprailliac and triceps skin folds, skin fold sum, waist circumference, WSR and WHR, in relation to adverse clinical variables (LDL-c, HDL-c, TC, DBP, SBP) profiles were 18.66, 8.10 mm, 14.49 mm, 11.99 mm, 38.22 mm, 68.15 cm, 0.44, 0.80, respectively. WSR mean values was 0.46 (SE 0.00) and presented the largest area under the curve (AUC) [0.613 (CI95%:0.578-0.647)] for high total cholesterol levels, the second largest AUC [0.546 (CI95%: 0.515-0.578)] for undesirable HDL-c levels, and the fourth largest AUC [0.614 (CI95%: 0.577-0.651)] for high LDL-c levels, while BMI presented the largest AUC [0.669 (CI95%: 0.64-0.699)] for increased DBP followed by the waist circumference for increased SBP [0.761 (CI95%: 0.735-0.787)].

Conclusions: WSR, a simpler and more accurate anthropometric parameter than BMI percentiles, WHR, skinfold thickness and waist circumference, better identifies youth with adverse lipid profile and could be indicative of adverse cardiovascular risk factors when above 0.44.

RELATIONSHIPS BETWEEN ABDOMINAL OBESITY, BASED ON THE WAIST-TO-HEIGHT RATIO, AND PARTICULAR COMPONENTS OF METABOLIC SYNDROME IN POLISH PERIPUBERTAL CHILDREN

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Objectives: It is well known that abdominal obesity is connected with metabolic syndrome in children. However, the definition of abdominal obesity in children is not clear. Most of obese children are taller than peers and the currently used percentile charts of BMI SDS, of waist circumference or of the waist-to-hip ratio for child's age, bring rather inadequate results. It seems that the optimal method is waist-to-height ratio (WHtR), based on percentile charts of this parameter created for given population. The aim of the study was to assess the incidence of particular metabolic syndrome components in children with and without abdominal obesity defined by WHtR.

Methods: One hundred and two children (65 boys), aged 11.4±2.7 yrs with simple obesity were qualified into the study. Depending on the percentile position of WHtR, the children were divided into two groups: with abdominal obesity (WHtR higher than 75 percentile, n=44) and without abdominal obesity (WHtR below 75 percentile, n=58). In each child, beside height, weight and waist circumference, the following parameters were also measured: blood pressure, body mass composition, lipids in fasting condition

and glucose and insulin concentrations during oral glucose tolerance test (OGTT). Moreover, the insulin resistance indices (IRI) by HOMA and Belfiore's methods were calculated.

Fasting HDL-cholesterol, triglyceride and glucose concentrations were regarded to be elevated vs. criteria for metabolic syndrome diagnosis in children, as proposed by Ferranti 2004. WHtR was accessed on the basis of the percentile charts, published for Polish children by Nawarycz 2007.

Results: In children with abdominal obesity, significantly higher values of: FAT%, systolic blood pressure, triglyceride, insulin at 60 minute of OGTT, IRI by Belfiore and significantly lower HDL-cholesterol were observed than in the group of children without abdominal obesity. In children with abdominal obesity, other components of metabolic syndrome also were observed more frequently than in children without abdominal obesity.

Conclusion: Regarding obese children, abdominal obesity assessment by WHtR is more useful than the other methods (the waist circumference only or the WHR). In most peripubertal children with abdominal obesity, regardless of their young age, disorders of lipid profile, hypertension or insulin resistance are present.

Clinical trials

OBESITY AND FEMALE INVOLUTIONAL MELANCHOLIA

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[Objective] To discuss the effect of obesity on the female caught involuntional melancholia, we research on the change of the obesity inducing involuntional melancholia.

[Method] 88 selected female patients (43 to 58 years old women) are divided as study group and control group (normal body weight), 44 cases on each.

Fasting blood-fat (CHOL, TG, HDL-C, LDL-C), fasting blood-glucose (GLU), inflammatory factors (CRP), serum follicle stimulating hormone (FSH), luteinizing hormone (LH) and estradiol (E2) are tested, respectively.

[Results]: Through statistical analysis, the difference of clinical symptoms between the study group and control group is obvious, ((CHOL(8.118±1.426; 4.695±0.518), TG(3.574±1.207; 0.788±0.508), HDL-C(4.636±0.697; 2.097±1.234), LDL-C(5.912±1.210; 3.323±0.888) and $P < 0.01$ has significant difference.

Taking BMI, WH as the independent variable to analyze on life quality, it was positively correlated with blood fat, blood sugar, and negatively correlated with the female ovary hormone lowness. Also, it was irrelevant to age and degree of education.

[Conclusion]: Obesity is inducing the quality of female patient life involuntional melancholia obviously reduced, and obviously increasing the cardiovascular

disease occurring, in addition, while middle-aged obese women would be a major risk factor for cardiovascular disease. Therefore, strictly controlling weight, strengthening the mental health guide and treatment improve dramatically the quality of middle-aged women life.

ORLISTAT 60 MG DEMONSTRATES A SIGNIFICANT REDUCTION IN VISCERAL ADIPOSE TISSUE AT 24 WEEKS COMPARED WITH PLACEBO

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Aims: To determine whether a 24 week weight loss program with orlistat 60mg plus diet will produce a greater reduction from baseline in visceral adipose tissue (VAT) mass compared to placebo plus diet in overweight and obese subjects.

Methods: This study was a 24 week, multicenter, randomized, double-blind, placebo controlled study. Overweight and obese subjects (BMI 25-35.0 kg/m²) with a waist circumference >88 cm (women) or 102 cm (men) were randomized to receive orlistat 60mg or placebo, 3 times per day along with recommendations to follow a reduced calorie, low-fat diet and encouraged to exercise. Body weight was measured at baseline and weeks 2, 4, 8, 12, 16, 20, and 24. VAT was measured by multi-slice abdominal CT scanning at baseline and at week 24.

Results: 123 subjects were randomized, treated and had at least one post-baseline assessment. Demographic and baseline characteristics were similar between orlistat 60mg (N=62) and placebo (N=61). Both groups had a significant decrease in VAT from baseline to week 24; however, the mean reduction in VAT was significantly greater in the orlistat-treated group (Table 1). For European interest, a post-hoc analysis among those with BMI≥28 showed a similar trend in the VAT reduction difference between treatment groups (p=0.105).

Treatment Group	N	Baseline Mean	Mean Change (% Change) Baseline to Week 24	p-value
Placebo	54	4.023	-0.403 (-9.39%)	<0.0001
Orlistat	55	3.807	-0.630 (-15.66%)	<0.0001
Difference (Placebo - Orlistat)			0.227	0.0244

[Mean Change in VAT (kg) from Baseline to Week 24]

Additionally, there was a significant reduction in mean body weight from baseline to week 24 in both orlistat- and placebo-treated subjects (-5.96kg and -3.91kg, respectively), but a significantly greater body weight loss was observed in the orlistat group (p< 0.05).

Conclusion: Orlistat 60mg plus diet results in significantly greater weight loss in overweight and obese individuals with increased waist circumference, and importantly, a significantly greater reduction in visceral fat as compared to placebo plus diet alone following treatment for 24 weeks.

ORLISTAT 60 MG PROVIDES SIGNIFICANT REDUCTION IN VISCERAL ADIPOSE TISSUE

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Aims To assess the potential efficacy of orlistat 60 mg in the reduction of body weight, waist circumference and visceral adipose tissue (VAT) in overweight and obese individuals.

Methods Overweight and obese individuals (BMI 25-35.0 kg/m²) with a waist circumference >88 cm (women) or >102 cm (men) participated in a 12-week weight loss study utilizing orlistat 60 mg tid along with a hypocaloric (-500 kcal), low fat diet. At baseline, subjects received a single dietary counseling session on the use of orlistat 60 mg in a weight loss program, and an abdominal MRI scan was performed to measure VAT. Body weight and waist circumference were measured at weeks 4, 8, and 12, with a repeat abdominal MRI scan at week 12.

Results 26 subjects received treatment in the study (7 female/ 19 male), and 24 subjects completed the 12 week study.

Baseline weight, waist circumference and VAT are presented in Table 1. After the 12 week treatment with orlistat 60 mg there was a significant reduction in body weight, waist circumference and VAT (Table 1). The change in visceral fat was correlated with the change in weight (r² =0.68 p< 0.001) but not waist circumference (r² = 0.22, p = 0.35). For European interest, post-hoc analysis for BMI ≥28 kg/m² also found reductions in body weight and waist circumference (N=22, P< 0.0001 for both) and VAT (N=19, P=0.0336).

Table 1. Mean Change in Weight, Waist Circumference and VAT from Baseline to Week 12

Treatment Group	n	Baseline Mean ± SD	Mean Change (% Change) Baseline to Week 12	p-value
Weight, kg	24	94.49 ± 12.75	-5.24 (-5.6%)	<0.0001
Waist Circumference, cm	24	105.3 ± 8.12	-4.54 (-4.3%)	<0.0001
VAT, L	20	5.77 (C V 44.1%)	-0.60 (-10.6%)	0.0225

[Mean Change in Weight, Waist Circumference and VAT]

Conclusion These data demonstrate that a 12 week weight loss program with orlistat 60 mg in combination with a low-fat diet, significantly reduced body weight, waist circumference and VAT. The change in VAT was associated with the change in body weight, but not waist circumference. The use of orlistat 60 mg in conjunction with a low fat diet can be an effective treatment option for reducing abdominal obesity, one component of the metabolic syndrome.

ORLISTAT 60 MG PROVIDES SIGNIFICANT REDUCTIONS IN BODY WEIGHT AND WAIST CIRCUMFERENCE

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Objectives: To examine the efficacy of orlistat 60mg for weight loss and reduction in waist circumference in overweight and obese individuals (BMI of ≥ 27 kg/m²).

Methods: Data from two similarly designed placebo-controlled trials were pooled and analyzed to assess the therapeutic efficacy of orlistat 60mg on weight loss and reduction in waist circumference at 6 and 12 months of treatment. Following a 4-week placebo lead-in period with a mildly hypocaloric diet (~500 kcal deficit/day), subjects were stratified based on weight lost (≤ 2 kg, >2 kg), randomized to receive placebo or orlistat 60 mg with meals, and instructed to maintain a hypocaloric diet for 1 year.

Results: Baseline demographics were comparable between placebo (n=448) and orlistat 60mg (n=452) treatment groups. The majority of patients were female and Caucasian, with a mean age of 43.4 years, and a mean BMI of 34.7 kg/m². Orlistat 60mg as compared to placebo provided significantly greater weight loss after 6 and 12 months (adjusted mean difference -2.3 ± 0.3 and -2.5 ± 0.5 kg, $P < 0.001$, respectively), and a significantly greater proportion of patients lost $\geq 5\%$ of baseline body weight at these time points (6 months: 26.4% vs. 46.7%, $P < 0.001$; 12 months 29.3% vs. 44.7%, $P < 0.001$). After 6 months, orlistat 60mg treated patients had a mean decrease in waist circumference of -4.5 ± 0.3 cm vs. -3.6 ± 0.3 cm for placebo ($P=0.013$); after 12 months the decrease was -5.2 ± 0.4 cm and -4.1 ± 0.4 cm, respectively ($P=0.028$). Among women with a high waist circumference (≥ 88 cm) at baseline, more women on orlistat 60mg (n=51/260; 19.6%) had a reduction to a normal waist circumference compared to placebo (n=32/263; 12.2%) at 6 months ($P=0.023$), but not at 12 months (orlistat 60 mg: 21.3% vs. placebo: 14.1%, $P=0.07$).

Conclusions: Orlistat 60mg in conjunction with a reduced-calorie diet provides significantly greater weight loss and reductions in waist circumference as compared to placebo plus diet, which may have important benefits to metabolic health.

ORLISTAT 60 MG PROVIDES SIGNIFICANT REDUCTIONS IN TOTAL AND LDL CHOLESTEROL, INDEPENDENT OF WEIGHT LOSS

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Objectives: To assess the efficacy of orlistat 60 mg compared to placebo on serum lipids in overweight and obese individuals.

Methods: An analysis of pooled data from two similarly designed placebo-controlled trials was performed to assess the therapeutic efficacy of orlistat 60 mg on total cholesterol (TC), LDL, HDL, and triglycerides (TG), including potential weight loss-independent effects. Following a 4-week placebo lead-in period with a mildly hypocaloric diet (~500 kcal deficit/day), subjects were stratified based on weight lost (≤ 2 kg, >2 kg), randomized to receive placebo or orlistat 60 mg with meals, and instructed to maintain a hypocaloric diet for 1 year. The primary efficacy endpoint was change in weight over time, with serum lipid changes as secondary efficacy parameters.

Results: Orlistat 60 mg provided significantly greater weight loss compared to placebo after 6 and 12 months ($P < 0.001$), and significantly more orlistat 60 mg treated subjects lost $>5\%$ of their baseline weight (responders; $P < 0.001$). TC was significantly lower in orlistat 60 mg treated subjects compared to placebo (mean treatment effect \pm SE; -0.27 ± 0.04 and -0.19 ± 0.05 mmol/L, $P < 0.001$) after 6 and 12 months, respectively. LDL was also significantly lower in orlistat 60 mg treated subjects (-0.28 ± 0.04 and -0.19 ± 0.05 mmol/L, $P < 0.001$) after 6 and 12 months, respectively. Changes in cholesterol levels remained significantly different between groups for both TC ($P \leq 0.004$) and LDL ($P < 0.001$) after correcting for weight loss. Significantly more subjects on orlistat 60 mg with elevated baseline TC or LDL levels exhibited a favorable shift to optimal levels, particularly among weight non-responders ($< 5\%$ of baseline body weight lost). Orlistat 60 mg did not provide significant improvements in HDL or TG compared to placebo.

Conclusions: Orlistat 60mg in conjunction with a reduced-calorie diet provides greater weight loss, which is associated with greater reductions in TC and LDL levels, compared to placebo. Moreover, even when corrected for weight loss, greater improvements in TC and LDL levels were achieved with orlistat 60 mg-treated compared with placebo, and thus appear to reflect a pharmacologic lipid lowering effect of orlistat.

THE EFFECTS OF FOOD SUPPLEMENT CONTAINING HERBAL EXTRACTS AND 1.3-1.6-BETA-GLUCAN ON BODY COMPOSITION AND WEIGHT IN FEMALES

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Objectives: The efficacy and tolerability of a new formulation based on natural ingredients, was investigated in this randomized, placebo controlled, double-blind study.

Subjects/methods: The formulation consists of a mixture of 6 different herbs and 1.3-1.6 β -glucan. The study was carried out in 58 middle aged female subjects with mild to moderate overweight (BMI ≥ 27.5 kg/m²) and with an average waist circumference (WC ≥ 95 cm). 30 subjects were treated with the active preparation and 28 subjects with placebo. Two subjects dropped out of the study.

Results: The results show that during a treatment period of 30 days significant reductions are seen in waist (WC) and abdominal circumferences (AC) and in the hip circumference (HC) ($p \leq 0.01$). No significant differences were seen in Body Weight (BW), Body Mass Index (BMI) or Body Fat (BF %).

Conclusion: With respect to the mechanism of action of the treatment it might be that the combination of the herb mixture and the 1.3-1.6- β -glucan might have an anti-inflammatory effect that will reduced the fat accumulation locally as well as effects on glucose and lipid metabolisms that will influence the fat storage. Additional research is warranted to further clarify the mechanisms responsible for these effects.

Diabetes

PREVALENCE AND ASSOCIATED RISK FACTORS OF UNDIAGNOSED DIABETES AMONG IN ARAB WORLD

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Diabetes is one of the most frequent metabolic diseases. It is widely distributed in various populations and its prevalence is predicted to be increasing rapidly which could affect more than 300 million people by 2025. Type 2 diabetes, previously known as non-insulin-dependent diabetes, accounts for 90-95% of diagnosed cases. However several studies in different countries have reported that up to half of all subjects with diabetes are undiagnosed.

Objective: The objective of the present work was to examine the prevalence and associated risk factors of undiagnosed diabetes among urban by the case of Moroccan women.

Design: Randomised sample of adult urban women, aged 15 years and older, who were not pregnant, living in the city of Laayoune in south Morocco and who visited public health centers during an immunization campaign. Body weight, height, waist and hip circumferences, blood pressure, fasting plasma glucose (FPG), triglycerides, dietary intake and physical activity were collected.

Results: The prevalence of impaired fasting glucose (IFG) was 5.5% and that of undiagnosed diabetes 6.4%. Diabetes and IFG were more common among older and obese women as well as among women with hypertension or a family history of diabetes. In addition, sucrose intakes were higher in women with diabetes than in those with normal FPG. Also, physical activity was negatively associated with FPG. Regression analyses showed an independent association of age, obesity, family history of diabetes and triglycerides with diabetes.

Conclusion: The high proportion of unknown diabetes suggests the need for increased diabetes awareness in this population. The data suggest also the involvement of obesity in diabetes and the potential importance of intervention strategies to reduce population adiposity for the prevention and management of cardiovascular risk factors.

Keywords: Undiagnosed diabetes, Obesity, adult Women, Morocco.

IMPACT OF HIGH-DENSITY LIPOPROTEIN PARTICLE SIZE ON CORONARY ARTERY DISEASE IN WOMEN WITH TYPE 2 DIABETES

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Aims: Despite the fact that as a group, type 2 diabetic patients are at increased risk of coronary heart disease, evidence suggests that such risk is highly variable and that it could be substantially affected by the presence/absence of features of the metabolic syndrome. The present study tested the hypothesis that HDL particle size could modulate the risk of angiographically assessed coronary artery disease (CAD) in women with type 2 diabetes (T2D).

Methods: We studied 239 women (aged 32 to 82 years) on whom CAD was assessed by angiography; 56 with known diabetes or fasting glucose ≥ 7.0 mmol/L and 183 women with fasting glucose < 7.0 mmol/L. Average HDL particle size was assessed by nondenaturing 4-30 % polyacrylamide gradient gel electrophoresis. The reference value for average HDL particle size (≤ 80.2 Å or > 80.2 Å) was determined by using its 50th percentile value.

Results: Type 2 diabetic women were characterized by higher adiposity indices as well as by a more disturbed fasting cardiometabolic risk profile than non-diabetic women. The odds ratio of being affected by CAD was increased by 3.7-fold (95% CI: 1.5 to 9.1; $p < 0.005$) among women with T2D compared to non-diabetic women. However, the risk of CAD associated with T2D was only increased among women characterized by small HDL particles (odds ratio 18.3, 95% CI: 2.4 to 140.4; $p = 0.005$), whereas T2D per se was not predictive of CAD in the absence of this phenotype. Moreover, a large proportion (80.0%) of women with T2D and with small HDL particles had the "hypertriglyceridemic waist" phenotype (waist circumference ≥ 80 cm and triglyceride levels ≥ 1.5 mmol/L) whereas its prevalence reached 57.7% in diabetic women with larger HDL particles.

Conclusions: Results of the present study suggest that small HDL particles is another feature of the metabolic syndrome which is associated with CAD in women with T2D.

OPTIMAL WAIST CIRCUMFERENCE CUT-OFF POINTS TO PREDICT THE RISK OF DIABETES TYPE 2 IN KUWAITI ADULT POPULATION

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Objective: To evaluate the value of the cut off points suggested by Adult Treatment Panel III (ATPIII) for waist circumference (WC) and to determine the optimal WC that predicts the subsequent diabetes risk, in Kuwaiti adult population.

Subject and method: A cross-sectional survey was conducted among Kuwaiti employees (20 years or older) in the ministry complex using gender stratified multi-stage cluster sampling (n=562). Receiver operating characteristic (ROC) curve analysis was used to identify optimal cut-off values of WC with sensitivity of 80% for detection of diabetes, and impaired fasting glucose IFG (Fasting glucose 6.1- 6.9 mmol/l).

Result: The optimal cut-off points for WC were between 90.5 and 97.5 cm for men and 83.5 and 87.5 cm for women in predicting diabetes risk for Kuwaiti adult population.

Conclusion: We found cut off suggested for waist circumference by ATPIII to have limited predictive value when applied Kuwaiti adult population, particularly for males. Thus, we developed new cut off for waist circumference to be used in any diabetes screening program in Kuwait.

Keywords: Waist circumference cut-off, Diabetes type 2, Kuwait.

CONSUMPTION OF ARTIFICIAL SWEETENERS AND DIABETIC PRODUCTS OF CHILDREN AND ADOLESCENTS WHO ATTENDED DIABETES CAMP

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Objectives: To evaluate the consumption of artificial sweeteners and diabetic products by the children attending to a diabetes camp in Istanbul, Turkey.

Methods: One hundred and fifty four children aged 8-18 years participated in the summer camp for 10 days organized by Child-Adolescent Diabetes Association and Istanbul University, School of Medicine, Paediatrics Department in 2009. Participants' mean diabetes duration were 5,9±3,6 years, chronological ages were 14,2±3,1 years. Consumption of artificial sweeteners and diabetic products were obtained by using a standardized questionnaire. Evaluation of the data has been made with SPSS-11 programme.

Results: More than half of the participants (59%) defined artificial sweeteners correctly. The majority of them (82%) were using the artificial sweeteners in tablet form and also preferred aspartame, cyclamate and saccharine 74.0%, 22.0%, 4.0% respectively. Soft drinks ice cream and also chocolate were the most popular products among diabetic children and adolescents. While 91% of participants were consuming diabetic ice cream, chocolate, marmelada etc, 62,3% of them were consuming home-made puddings, baklava, composts etc made of artificial sweeteners. In general, and interestingly, sweets and desserts made of table sugar were consuming to treat hypoglycaemia (71%). Diabetics were also drinking diet soft drinks (330 ml in a day) regularly.

Conclusion: Children and adolescents with diabetes have no sufficient knowledge about artificial sweeteners. They preferred commercial or home-made diabetic products, and also had an unconscious consumption. We believe that it would be beneficial to provide a comprehensive training to the diabetic children and their families on the artificial sweeteners and dietary products and their use.

TYPE 2 DIABETES AND IMPAIRED FASTING BLOOD GLUCOSE IN RURAL BANGLADESH: A POPULATIONBASED STUDY

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Background: Diabetes is a fast expanding global health problem but more so in the developing countries. Therefore, it is of particular interest to study the epidemiological transition of the state and to identify the risk factors in order to recognize the extent of the problem.

Methods: A random sample of 5000 rural individuals (age 20 years) were included in a cross-sectional study. Fasting capillary blood glucose levels were measured from 4757 individuals. Height, weight, waist, hips including blood pressure and demographic information was collected.

Results: The study population was lean [mean body mass index (BMI) 19.4] with a low prevalence of type 2 diabetes but relatively high impaired fasting

glucose. No relationship between type 2 diabetes and BMI in men, but an overall relationship was observed for women (P = 0.04). Age, sex, and waist/hip ratio (central adiposity) appeared to be important risk factors for the occurrence of type 2 diabetes in this population.

Conclusions: Low prevalence of type 2 diabetes and relative high impaired fasting blood glucose was observed. The factors associated with the occurrence of diabetes in this population appeared to differ than its known relations with BMI. This may indicate that the risk factors for type 2 diabetes are likely to differ in different population. Central adiposity as measured by waist/hip ratio appeared to be a sensitive parameter for diabetes. Our results are likely to be in line with the Indian data suggesting that a revised guideline for anthropometric measures in the South Asian population is called for, in order to classify people at risk.

COMPARISON OF BODY MASS INDEX WITH ABDOMINAL OBESITY INDICATORS AND WAIST-TO-STATURE RATIO FOR PREDICTION OF TYPE 2 DIABETES

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Objectives: The aim of this study was to compare the ability of the body mass index (BMI), waist circumference (WC), waist-to-hip ratio (WHR) and waist-to-stature ratio (WSR) to predict progression to diabetes in non-diabetic first-degree relatives (FDR) of patients with type 2 diabetes.

Methods: A total of 704 non-diabetics FDR 20-70 years old in 2003 to 2005 were followed through 2008 for the occurrence of type 2 diabetes mellitus. At baseline and through follow-ups, participants were underwent a standard 75 g 2-h oral glucose tolerance test. Prediction of progression to type 2 diabetes was assessed with area under the receiver-operating characteristic (ROC) curves based upon measurement of BMI, WC, WHR and WSR.

Results: The incidence of type 2 diabetes was 3.4% per year in men and 4.9% in women. BMI, WC and WSR were related to diabetes. These three obesity indicators have similar associations with incident diabetes. Areas under the ROC curves were 0.625 for BMI, 0.620 for WC, 0.611 for WSR and 0.538 for WHR.

Conclusions: These data indicate that BMI was as strong as WC or WSR in predicting progression to diabetes.

COMBINATION THERAPY OF ROSIGLITAZONE COMBINED WITH FENOFIBRATE IN OBESE TYPE 2 DIABETIC MOUSE

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Peroxisome proliferator-activated receptor α (PPAR α), abundant in liver, increases in the lipoprotein lipase activity and results in the decrement of triglyceride (TG) levels. PPAR γ , abundant in adipose tissue, stimulates adipocyte differentiation and adipogenesis, and results in the increment

of insulin sensitivity. Fenofibrate, a PPAR α agonist, is commonly used to treat dyslipidemia, and rosiglitazone, a PPAR γ agonist, is effective in improving glycemic control. To examine the synergistic effect of rosiglitazone combined with fenofibrate, obese type 2 diabetes mellitus (DM) mouse model was established by the combined administration of streptozotocin with nicotinamide and fed with high-fat diet (40% of energy as fat), showing significantly higher plasma glucose concentration and insulin resistance examined by oral glucose tolerance test and insulin challenging test as compared with normal. After establishing dose-response curve for each drug, 1/2, 1/4, 1/8 or 1/16 of the highest dose (human equivalent dose) of each drug was orally administered for 3 weeks by alone or combined. The administration of 1/4 dose of rosiglitazone combined with 1/4 dose of fenofibrate decreased in plasma glucose and TG level, and increased in plasma HDL cholesterol level. Moreover, the parameters related with insulin resistance (HOMA-IR) and insulin sensitivity (QUICKI) were significantly improved. Therefore, our results describe that combination therapy with lower doses of rosiglitazone with fenofibrate ameliorates type 2 DM condition to a greater extent than high doses of either individual monotherapy.

HYPOADIPONECTINEMIA IN OBESE SUBJECTS WITH TYPE 2 DIABETES: CLOSE ASSOCIATED WITH CENTRAL OBESITY INDICES

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Background and objective: Adiponectin is an adipocyte secreted protein with important biological functions. Hypoadiponectinemia is associated with obesity, insulin resistance, and type 2 diabetes. The aim of this study was to evaluate serum adiponectin level in obese subjects with type 2 diabetes and its correlation with metabolic parameters.

Materials and methods: This cross-sectional study was performed on 40 obese subjects with type 2 diabetes and 40 obese non-diabetic controls. Fasting lipid profile was measured by the enzymatic methods. The NycoCard HbA1c protocol was used to measure HbA1c. The Serum adiponectin, insulin and glucose levels were measured by an enzyme immunoassay, and glucose oxidase methods respectively.

Results: Type 2 diabetes was associated with hypoadiponectinemia, in both men and women. Serum adiponectin level in non-diabetic ($6.44 \pm 2.47 \mu\text{g/ml}$) was significantly higher than diabetic ($4.55 \pm 1.88 \mu\text{g/ml}$). Furthermore, serum adiponectin concentration in females was significantly higher than males in non-diabetic (7.18 ± 2.68 vs. 5.61 ± 0.57) and diabetic groups (5.18 ± 2.08 vs. 3.99 ± 1.5). There was a negative and significant correlation between serum adiponectin level with waist ($r = -0.451$, $p = 0.003$), waist to hip ratio ($r = -0.404$, $p = 0.01$) and BMI ($r = -0.322$, $p = 0.042$) and positive correlation with HDL ($r = 0.337$, $p = 0.034$) in non-diabetic group. In diabetic group we found only a negative correlation between adiponectin and waist size ($r = -0.317$, $p = 0.046$).

Conclusion: Obesity and type 2 diabetes are associated with low serum adiponectin concentration. Adiponectin is likely to be involved in the pathophysiology linking obesity to type 2 diabetes.

Keywords: Adiponectin, Type 2 diabetes, Obesity, BMI.

PLASMA MAGNESIUM IN TYPE 2 DIABETIC PATIENTS

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Magnesium is the second most abundant intracellular cation. It has been reported that insulin stimulates magnesium uptake in insulin-sensitive tissues.

Aims: The aim of this study was to investigate plasma magnesium status in type 2 diabetic patients (T2DM), and compare with healthy persons.

Methods: Ninety-nine of T2DM patients (78 female, and 21 male) who came to diabetic clinical visit at Chumsaeng Hospital, Nakonsawan, Thailand, were used as voluntary subjects. Plasma magnesium of the patients was assayed by colorimetric method, and compared with 50 of healthy persons (33 female, and 17 male).

Results: Mean(SD) age of 60(9.5), and 49(4.5) years was found in patients and control group, respectively. Body mass index of 25(3.8) in patients was significantly differently from those of control group, 23(2.2) kg/m^2 ($P < 0.05$). Fasting blood glucose was of 147 mg/dL, and 8.1(1.6)% of glycated hemoglobin were observed in T2DM. Mean (SD) of magnesium level in the patients was of 1.9 ± 0.25 mg/dL, and significantly different from those of 2.4 ± 0.13 mg/dL found in control group ($P < 0.05$). Negatively correlation between plasma magnesium and blood glucose was observed in patients.

Conclusions: Lower magnesium level than healthy persons is demonstrated in T2DM, however, this level is in normal low reference range. Magnesium supplementation in T2DM patients should be taken into consideration to restore plasma magnesium levels.

INTRA-ABDOMINAL FAT AND METABOLIC RISK FACTORS IN PATIENTS WITH TYPE 2 DIABETES

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For young adults, intra-abdominal fat, measured with a CT scan of the abdomen, was significantly and linearly associated with features of the metabolic syndrome like blood pressure, high density lipoprotein (HDL) cholesterol, triglycerides, and fasting glucose (Int J Obes 2003; 27:941-9). The association was stronger for intra-abdominal fat than for anthropometric measurements of abdominal obesity like body mass index (BMI), and waist circumference. Most patients with type 2 diabetes are overweight or obese. Accordingly, we studied 63 adult Caucasian patients treated at a Norwegian hospital, undertook anthropometric measures and CT scans of subcutaneous and intra-abdominal fat, and measured main metabolic risk factors. 35 of 60 (58%) patients were obese with BMI $>30 \text{ kg/m}^2$, 47 of 59 (80%) were abdominally obese (waist circumference $>1.00 \text{ m}$), and 55 patients (87%) were intra-abdominally obese with intra-abdominal fat $>135 \text{ cm}^2$. BMI and waist circumference were associated with subcutaneous and intra-abdominal fat ($P < 0.00005$). Compared with subcutaneous fat, intra-abdominal fat was more strongly associated with serum HDL cholesterol concentration ($P = 0.0008$, $r^2 = 0.16$), and serum triglyceride concentration ($P = 0.029$, $r^2 = 0.06$), and number of metabolic risk factors ($P < 0.00005$, $r^2 = 0.32$). In summary, for patients with type 2 diabetes, intra-abdominal obesity may be more important for the metabolic syndrome than subcutaneous abdominal and overall obesity.

EFFECTS OF HIGH FAT AND SUCROSE DIET ON HYPERGLYCEMIA ONSET IN NORMAL RATS

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Objective: Obesity, high fat and/or high sugar dietetic/sedentary life style are major risk factors to develop type 2 diabetes. Presently, we use factorial experiment design to determine the main effect and interaction between fat and sugar on extra body weight gain and hyperglycemia development in normal rats.

Methods: After adapt to the environment for 3 days, 130 healthy Wistar rats were randomly given with or without high fat/sugar feeds (HFS). According to the content of saturate fat (from lard, F) and sucrose (S) in feeds, the groups were distinguished by 0F0S, 10F10S, 10F20S, 20F0S, 20F10S, 20F20S. Body weight, fasting blood glucose (FBG), 2 h postload blood glucose (PBG), and blood lipid level were under surveillance. 16 weeks later, visceral organs were separated to determine glycogen storage, cholesterol metabolism and pancreatic islet texture.

Results: Once rats fed with HFS diet, body weight net gain was undoubtedly fast increased, accompanying with gradually rise of glycemia. The significant increment of PBG was appeared after 4 weeks (6.3 ± 0.9 mmol/L vs. 5.5 ± 0.9 mmol/L, HFS compared with normal rats), and further higher after 8 weeks (8.6 ± 1.1 mmol/L), in addition of damaged FBG. (5.2 ± 0.8 mmol/L compared with normal 4.4 ± 0.5 mmol/L). The difference of glycemia among groups was 20F10S>20F20S=20F0S>10F10S>10F20S>0F0S. Multivariate analysis showed that saturate fat was the main factor leading to obesity and high blood glucose level, while sugar was only a cofactor to influent the process of hyperglycemia development, without making glycemia worse as anticipated. Glycogen level both in hepatic and muscle tissues showed that high sugar diet (20%) could accelerate glucose storage in muscle (0.60 ± 0.22 mg/g vs. 0.25 ± 0.06 mg/g, compared with other groups), that maybe a good footnote of the influence of sugar on heperglycemia. Similarly, blood lipid also arose in HFS fed rats. But, interestingly, influence of sugar on blood triglyceride was more significant, TG level was accordingly elevated with sugar content in diet (20S>10S>0S). No significant change was observed in pancreatic islet cell by immune-histochemical test. Factor analysis confirmed the close correlation between body weight gain and postprandial hyperglycemia development.

Conclusions: Fat and sugar can disturb glucose and lipid metabolism through different way.

OBESITY, METABOLIC SYNDROME AND SLEEP DISTURBANCES IN JAPANESE MALE PATIENTS WITH DIABETES MELLITUS

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About one-fifth of general populations have any sleep disturbances in Japan. Sleep disturbances may be its impact on glucose metabolism and diabetes. But the association between sleep disturbances and their correlates in diabetic patients is unclear. The purpose of the present study was to examine the prevalence and correlates of sleep disturbances in Japanese male

patients with diabetes mellitus. Subjects were 60 newly-diagnosed male patients with type 2 diabetes mellitus and impaired glucose tolerance who were attending a behavioral diabetes education class (54.9 ± 9.1 years, body mass index [BMI]= 25.0 ± 3.7 kg/m²). Sleep disturbances were examined using a structured questionnaire. Difficulty Initiating Sleep (DIS) was defined as having fall asleep at night 30 minutes and more. Difficulty Maintaining Sleep (DMS) was defined as waking up during the night after you have gone to sleep 2 times/day and more. Excessive Daily Sleepiness (EDS) was defined as feeling drowsy or sleepy most of the day but manage to stay awake always or often. According to the Japanese guidelines, obesity (BMI \geq 25) and metabolic syndrome (waist circumference \geq 85 and two metabolic risk factors [fasting blood glucose \geq 110 or systolic /diastolic blood pressure \geq 130/85 or trygliceraid] \geq 150 and/or HDL cholesterol $<$ 40) was defined. To examine the association between sleep disturbances and their correlates, univariate and multivariate logistic regression analysis were performed. The overall prevalence of any sleep disturbances was 38.3%, including difficulty initiating sleep (DIS: 6.7%), difficulty maintaining sleep (DMS: 16.9%), and excessive daytime sleepiness (EDS: 20.0%). Multiple logistic regression analysis showed that any sleep disturbances was associated with obesity (odds ratio 4.56 [95% CI 1.33-15.6]) and metabolic syndrome (odds ratio 6.78 [95% CI 1.88-24.41]). These findings indicate that the prevalence of sleep disturbance in the diabetic patients is comparable to that reported in general population of Japan, and that obesity or metabolic syndrome may be important risk factors with sleep disturbances in Japanese male diabetic patients.

AROMADENDRIN STIMULATES GLUCOSE UPTAKE THROUGH UP-REGULATION OF PPAR γ 2 EXPRESSION AND ACTIVATION OF AKT

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Type 2 diabetes is a world-wide disease characterized by hyperglycemia and insulin resistance. The goal of the present study was to screen compound with glucose lowering and insulin sensitizing effect and clarify its molecular mechanism. 2-[N-(7-nitrobenz-2-oxa-1, 3-diazol-4-yl) amino]-2-deoxy-d-glucose (2-NBDG), a fluorescent D-glucose analog, was applied to measure the basal and insulin-stimulated glucose uptake in HepG2 and 3T3-L1 adipocytes. Peroxisome proliferator-activated receptor γ 2 (PPAR γ 2) and adipocyte-specific fatty acid binding protein (aP2) mRNA expression in differentiated 3T3-L1 adipocytes was determined by reverse transcriptase polymerase chain reaction (RT-PCR). PPAR γ 2 protein level in differentiated 3T3-L1 adipocytes and Akt phosphorylation in high glucose-induced, insulin-resistant HepG2 cells were examined by western blot. In our screening system, aromadendrin, a flavonoid from *Gleditsia sinensis* Lam. (Leguminosae), exhibited strong effect on the basal and insulin-stimulated glucose uptake. Aromadendrin notably increased PPAR γ 2 and aP2 mRNA expression and PPAR γ 2 protein level in differentiated 3T3-L1 adipocytes. It also activated Akt in high glucose-induced, insulin-resistant status; however, this response was abrogated by pretreatment of LY294002, a phosphatidylinositol 3-kinase (PI3K) inhibitor. The increase of PPAR γ 2 and aP2 expression and activation of PI3K/Akt pathway by aromadendrin may contribute to glucose uptake and insulin sensitivity. Therefore, our data mentioned above imply a positive association between aromadendrin and diabetes treatment.

Epidemiology

CONSISTENT CORRELATION BETWEEN LIPID PROFILE, BODY MASS INDEX AND WAIST-CIRCUMFERENCE AMONG HYPERCHOLESTEROLEMIC SUBJECTS IN INDONESIA

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Introduction: One of the most important risk factors for Coronary Heart Disease (CHD) is dyslipidemia (changes of serum lipid profile), especially hypercholesterolemia, and hypertriglyceridemia. Screening on serum lipid profile will be costly and invasive. This study aims to find proxy measure for lipid profile using anthropometric indices such as body mass index (BMI) and waist-circumference (WC).

Methods: Fifty-two hypercholesterolemic subjects underwent intervention study in the form of nutrition counseling to control their blood cholesterol level for six weeks during 2006-2007 at Medical Nutrition Specialist Clinic - FMUI. Besides lipid profile data (total cholesterol, LDL- and HDL-cholesterol and triglyceride), body mass index and waist-circumference measures were also collected at before and after the intervention. Spearman-rank correlation was used to evaluate consistent correlation between lipid profile and anthropometric measures.

Results: At baseline, there was significant positive correlation between BMI and WC ($P < 0.001$ and $r = 0.680$), however, only WC had significant positive correlation with triglyceride ($P = 0.03$ and $r = 0.384$). After end of intervention, there was still significant positive correlation between BMI and WC ($P < 0.001$ and $r = 0.729$), and consistently there was significant positive correlation between WC and triglyceride ($P < 0.001$ and $r = 0.528$). In addition, there was significant negative correlation between WC and HDL-cholesterol ($P = 0.035$ and $r = -0.290$). Furthermore, during the intervention, change in WC had a significant positive correlation with BMI-change ($P = 0.022$ and $r = 0.314$) and also with triglyceride-change ($P = 0.017$ and $r = 0.329$).

Conclusion: Waist-circumference could be used to screen blood triglyceride level as one approach to preventing CHD in population.

Keywords: Body-mass-index, triglyceride, waist-circumference.

ADVANCED GLYCATION ENDPRODUCTS, MEASURED BY SKIN AUTOFLUORESCENCE, IN A POPULATION WITH CENTRAL OBESITY

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Aims: Higher skin autofluorescence (AF), as a measure of accumulation of advanced glycation endproducts (AGEs), is associated with micro- and macrovascular disease in patients with diabetes. Formation and accumulation of AGEs is enhanced by oxidative stress. Central obesity enhances oxidative stress; individuals with central obesity might already have increased accumulation of AGEs before diabetes or cardiovascular disease become manifest. Therefore we compared:

1. the distribution of skin AF and
2. the association of skin AF with clinical and biochemical parameters in individuals with and without central obesity.

Methods: Skin AF was measured by a validated AGE reader in 813 centrally obese individuals (waist circumference > 88 cm for women; > 102 cm for men) and 427 individuals without central obesity. They were aged 20-70 years and not known with diabetes, hypertension or dyslipidemia. Univariable and multivariable associations with clinical and biochemical parameters were assessed.

Results: Mean skin AF was 1.86 ± 0.43 AU in the centrally obese, compared to 1.77 ± 0.40 AU in the individuals without central obesity ($p = 0.001$, after adjustment for age $p = 0.08$). Age (B 0.019), current tobacco smoking (B 0.207), current alcohol drinking (B -0.088), waist circumference (B 0.005), creatinine clearance (B -0.001) and hs-CRP (B 0.028) were independently associated with skin AF ($R^2 = 29.3\%$).

Conclusions: Skin AF is higher in centrally obese individuals and independently associated with an increasing waist circumference. As hypothesized, persons with central obesity indeed seem to have increased accumulation of AGEs, as measured by skin AF, which might be due to increased oxidative stress. 29.3% of the total variance was explained by the factors under study. Probably other factors such as food-derived AGEs contribute to the explained variance in people with central obesity.

CHANGES IN SERUM 25(OH)D LEVELS ARE PREDICTED BY ADIPOSITY, ADIPOCYTOKINES AND LIPIDS IN OLDER ADULTS

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Purpose: To determine the associations between body fat, adipocytokines, lipids and change in serum 25(OH)D levels over 2.6 years in older adults.

Methods: Longitudinal study of 859 randomly selected subjects (mean 62 years, range 51-80, 49% female). Serum 25-hydroxyvitamin D [25-(OH)D] was assessed by radioimmunoassay on two occasions. Total cholesterol and high-density lipoprotein (HDL) were determined enzymatically. Fat mass was measured by dual energy x-ray absorptiometry (DXA), and waist-hip ratio and body mass index (BMI) was calculated. Baseline serum levels of leptin and interleukin (IL)-6 were assessed by radioimmunoassay in the first 183 subjects.

Results: In multivariable analyses, change in 25-(OH)D levels per annum was significantly predicted by baseline BMI (β : -0.13 unit/ kg/m², 95% CI: -0.22, -0.04), waist-hip ratio (β : -13.97, 95% CI: -20.55, -7.40), and trunk fat percentage (β : -0.11, 95% CI: -0.17, -0.05). It was also independently predicted by baseline leptin (β : -0.09/unit, 95% CI: -0.17, -0.03), IL-6 (β : -0.68/quartile, 95% CI: -1.35, -0.02), and total cholesterol/HDL ratio (β : -0.51, 95% CI: -0.88, -0.14). The associations between body adiposity measures and change in 25-(OH)D all disappeared after adjustment for leptin, partly decreased after adjustment for IL-6, but remained unchanged after adjustment for total cholesterol/HDL ratio. All associations were independent of confounders including sun exposure.

Conclusions: Body fat is not simply a passive reservoir of 25OHD. In addition to sun exposure, vitamin D levels appear to be determined by metabolic and, to a lesser extent, inflammatory factors, and these mediate the effects of body composition on change in vitamin D over time.

CHARACTERISTICS AND PREVALENCE OF METABOLIC SYNDROME AMONG THREE ETHNIC GROUPS IN CAMEROON

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Objective: To compare the characteristics and prevalence of the metabolic syndrome (MetS) in three Cameroonian population: Beti, Bamiléké, Sawa.

Methods: The study was based on four cross-sectional studies conducted between 2006 and 2008. Among the participants received during the study, originate from three ethnic groups living in the urban city of Yaounde were selected to underwent anthropometric measurement and biochemical test. The MetS was identified among participants according to the National Cholesterol Education Program (NCEP) definition.

Results: The age-standardized prevalence of the MetS varied by ethnic group, ranging from as high as 16.8% among Bamiléké women to as low as 2.7% among Beti men. Compared with MetS components overall prevalence in Cameroon, Sawa had a worse metabolic profile, while Bamiléké had a better metabolic profile except for a high rate of abdominal obesity.

Conclusions: The results indicate that the MetS is prevalent in diverse ethnic groups in Cameroon but varies in the pattern of phenotypic expression. Preventives measurements must take into account these ethnics variations for the efficient reduction of metabolic syndrome frequency in Cameroonian population.

CORRELATION BREAKFAST CONSUMPTION PATTERN AND CONSTIPATION SYMPTOMS AMONG JAPANESE UNIVERSITY STUDENTS

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Aim: Constipation is a cause of numerous lifestyle diseases, and it is particularly important to achieve a balanced lifestyle by improving constipation in order to alleviate obesity. This study was conducted for the purpose of identifying a correlation between breakfast consumption pattern and constipation symptoms among Japanese university students.

Methods: A self-administered questionnaire survey was conducted on 1018 university students enrolled at universities in H prefecture in Japan. The survey parameters consisted of attributes, physical measurements, residential status, lifestyle/dietary survey and constipation symptoms. Furthermore, the Constipation Assessment Scale (CAS) was used to evaluation constipation symptoms. Statistical analysis consisted of analyzing breakfast consumption pattern and evaluation of constipation using the

c² test, followed by conducting a residual analysis by focusing on the adjusted standardized residual when a significant result was obtained.

Results: Significantly more female adolescents (30.7%) than male adolescents (16.3%) had pronounced symptoms ($p < 0.05$). A comparison of breakfast consumption patterns between men and women revealed that many men skipped breakfast ($p < 0.01$), while a significant number of women ate side dishes only ($p < 0.05$). With respect to the correlation between obesity tendency and breakfast consumption pattern, there was a significantly large number of subjects exhibiting an obesity tendency who demonstrate a "Staple food and main dish" pattern, while a "Staple food and side dish" pattern was observed prominently among subjects not exhibiting an obesity tendency ($p < 0.05$). With respect to the correlation between constipation symptoms and breakfast consumption pattern, the percentage of women exhibiting a constipation tendency was significantly higher for "main dish only" or "skip breakfast". There were no significant correlations observed among men. There were no correlations observed for men or women with respect to the correlation between BMI and breakfast consumption pattern.

Conclusion: The findings of this study suggested that in order for female university students to improve constipation symptoms, it is important to eat breakfast while combining a foodstuff and side dish with a main dish. In addition, among male university students, it is required to reduce the number of students who skip breakfast in an effort to enhance QOL.

THE RELATIONSHIP BETWEEN HEALTH HABITS AND CONSTIPATION SYNDROME IN JAPANESE ADOLESCENTS: A SCHOOL-BASED SURVEY

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Background: Constipation syndrome (CS) is a common problem in Japanese adolescents. However, little is known about lifestyle and psychosomatic factors of constipation syndrome among Japanese early adolescents.

Objectives: The purpose of the study was to explore the prevalence of constipation syndrome (CS) and identify the potential factors associated with CS in Japanese early adolescents.

Methods: We adopted a cross-sectional study design using a self-administered questionnaire. The subjects were 814 adolescents recruited from a Junior high school in Japan. CS was measured by the Constipation Assessment Scale (CAS), which is an eight-item self-report measure designed to assess the presence and severity of constipation and was translated into Japanese by Fukai (1995). Potential risk factors for CS were identified from previously published studies and included age, sex, body mass index (BMI), dietary habits (daily fruit, vegetable, fast food, snack food, instant food intake, sugary drink), life style (having breakfast, sleep time), and mental health (stress, anxiety, and depression). Statistical analysis was done using Chi-square test and multivariate logistic regression analysis.

Results: The mean of CAS score was 2.65 (range 0-16). One-hundred sixty adolescents (21.7%) had a CAS of 5 or more, indicating more pronounced constipation syndromes, whereas 577 adolescents (78.3%) had a CAS of 4 or less, indicating minimal or no constipation syndromes. Significantly more female adolescents (24.9%) than male adolescents (18.2%) had pronounced symptoms ($p=0.027$). According to multivariate logistic regression analyses, presence of constipation was significantly associated with fast food intake (not at all: Odds Ratio = 1, sometimes: OR = 4.6, 95%CI= 1.5 - 13.5), anxiety (not at all: OR=1, rather more than usual: OR = 2.4, 95%CI= 1.2 - 4.8), and depression (not at all: OR=1, rather more than usual: OR = 2.4, 95%CI= 1.2 - 5.1).

Conclusion: More fast food intake and poor mental health might be related to development of CS in the students of the junior high school involved in this study. These findings imply the necessity of providing appropriate mental health care to the population and recommending them to limit consumption of fast food to prevent CS.

ABDOMINAL OBESITY IS A GOOD PREDICTOR OF HEART RATE VARIABILITY AMONG NATIVE CANADIANS

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Background: Heart rate variability, which represents the cardiac modulation of the autonomic nervous system, has been suggested to be lower in obese patients.

Objective: We aimed to explore the associations between different obesity indices [body mass index (BMI), waist circumference (WC), waist-to-hip ratio (WHR), and % of body fat] and HRV parameters among Nunavik Inuit adults (Northern Quebec, Canada).

Methods: A health survey was conducted in the 14 communities of Nunavik and information was collected among 181 adults aged 40 years and older. HRV was obtained from a 2-hour Holter monitoring assessment. Indices of parasympathetic activity such as high frequency (HF), the standard deviation of RR intervals (SDANN) and the mean squared differences of successive R-R intervals (rMSSD) were obtained. Anthropometric measurements (waist and hip circumference) were obtained by standardized protocol while body composition was assessed by bio-impedance analysis. The relationship between obesity indices and HRV were investigated by multiple regressions controlling for confounders.

Results: Mean age of the participants was 51 years (SD: 27) and the sample was composed of 109 women (60.2%) and 72 men (39.8%). Means of BMI, WC, WHR, and % of body fat were 28.2 Kg/m² (SD: 16), 94 cm (SD: 38), 0.9 (SD: 0.2), and 29.0 % (SD: 27) respectively. BMI and WC were similar in women and men ($p > 0.05$) while these latter had higher WHR (0.93 vs. 0.91; $p = 0.01$) and lower % of body fat than women (24.7 vs. 33.2%; $p < 0.0001$). In simple linear regression, all obesity indices were positively associated with HRV parameters but WC was the index that better predicted HF ($p < 0.0001$), SDNN ($p = 0.0003$) and rMSSD ($p < 0.0001$). All these associations remained statistically significant after adjustment for age, gender, diabetes and smoking. WC remained the best predictor in HF ($p = 0.0001$), SDNN ($p = 0.01$) and rMSSD models ($p < 0.0001$).

Conclusions: In this ethnic group known to have high level of obesity, HRV was better predicted by WC compared to BMI, WHR and % of body fat. These results support the hypothesis that WC could be more appropriate to predict cardiovascular risk than the other obesity indices.

RISK AMONG HYPERTENSION WITH DIABETES MELLITUS PATIENTS IN THE SOUTHERNMOST PROVINCES OF THAILAND, 2009

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Background: Hypertension is the third highest rate of admitted patients in the south of Thailand. Patients with hypertension and diabetes mellitus (HTDM) have higher risk for developing stroke and heart disease than those of the hypertensive patients. There is no study about the risk factors among HTDM in this population before.

Objective: To determined the risk factors that associated with HTDM among HT patients.

Methods: We conducted a cross-sectional study in 2009. Multi-stage cluster sampling was performed. We randomly sampled 4 out of 7 provinces. Sample sizes of each province were sampling proportional to size of registered patients. In each province, we selected 1 provincial hospital (PH), 3 community hospitals (CH), and 3 primary health care units (PCU). A total of 996 HT participated in the study. They had anthropometry measurement, including waist circumference (centimeter-cm), hip circumference (cm.), weight (kilogram-kg), and height (meter-m). They had blood pressure measurement (mmHg) and face-to-face interview. We retrieved information of heart disease, stroke, blood pressure, lipid profile, and fasting blood sugar (FBS) from medical records.

Results: The prevalence of HTDM was 32.9%. Among 270 HTDM, the majority of the HTDM were female (72.4%), housewife (51.9%), Buddhism (86.5%), and had primary education or less (64.7%). The mean age of HTDM was 63.5 ± 0.4 years. The uncontrolled HT was 81.2%. The prevalence of stroke and heart disease among HTDM were 1.8% and 3.8%, subsequently. When compare to HT patients, HTDM patients were more likely to have age ≥ 45 years in male and age ≥ 55 years in female (RR=1.51, 95%CI=1.20-1.90), history of mother having hypertension at age < 65 years (RR=2.54, 95% CI=1.01-6.41), WC ≥ 90 cm. in male and ≥ 80 cm. in female (RR=1.60, 95% CI=1.18-2.23) and WHR ≥ 0.90 cm. in male and ≥ 0.80 cm. in female (RR=1.47, 95% CI=1.09-1.99)

Conclusions: The prevalence of HTDM, stroke, and heart disease were high among HT patients in the southernmost provinces. The preventable or controllable risk factors that significant associated with HTDM were overweight. The proportion of uncontrolled HT was very high. The intervention should be implemented urgently to reduce the risk. Long term follow-up should be done to assess intervention.

COMPARISON OF WAIST-TO-HEIGHT RATIO, WAIST-TO-HIP RATIO AND WAIST CIRCUMFERENCE IN PREDICTING HYPERGLYCEMIA: A 3-YR COMMUNITY-BASED FOLLOW-UP STUDY IN NANJING, CHINAF. Xu¹, Y. Wang², L. Lu³, J. Li¹, Y. Liang⁴, Z. Wang⁴, X. Hong⁴

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Objectives: To evaluate the performance of waist-to-height ratio (WHtR), waist-to-hip ratio (WHR), and waist circumferences (WC) in predicting the development of hyperglycemia among Chinese adults.

Methods: This community-based prospective study was conducted in 4 communities from July of 2004 to July of 2007 in Nanjing China. The 3031 subjects were all local non-diabetic residents who had no hyperglycemia at baseline and aged 35 years or greater in selected communities. Fasting hyperglycemia was assessed based on WHO criteria. Logistic and linear regression models as well as receiver operating characteristic (ROC) curve analysis were used to evaluate the performance of WHtR, WHR and WC in predicting hyperglycemia.

Results: The follow-up rate was 81.3% in this study. During 3 years of follow-up, the overall cumulative incidence of hyperglycemia was 8.6% (men vs. women = 8.0% vs. 9.0%, $p=0.32$). For men, with adjustment for potential confounders and BMI in multivariate logistic regression models, relative risks (RRs) across quartiles of WHtR were 1.00, 0.98, 2.63, and 5.12; those of WHR were 1.00, 2.19, 1.78, and 3.39; and those of WC were 1.00, 1.25, 1.61, and 3.26 (p for trend < 0.01 for all). While, for women, the corresponding RRs of WHtR were 1.00, 1.21, 2.15, and 4.39; those of WHR were 1.00, 1.34, 1.48, and 2.27; and those of WC were 1.00, 1.65, 3.07, and 6.30 (p for trend < 0.01 for all). Multivariate linear regression analysis suggested that WHtR, WHR, and WC could explain only 6.6%, 6.3%, and 6.9% of the variation in participants' fasting blood glucose concentration, respectively. Areas under the curves (AUCs) in ROC analysis were 0.65, 0.63, and 0.64 for WHtR, WHR, and WC among men, while among women the AUCs were 0.63 for WHtR, WHR, and WC. Among this study population, the preferable cutoff values for WHtR, WHR, and WC were 0.51, 0.92, and 85 for men, while 0.55, 0.86, and 82 for women, respectively.

Conclusions: WHtR, WHR, and WC were positively associated with risk of development of hyperglycemia. As indicators of abdominal obesity, they had the similar performance power in predicting hyperglycemia for Chinese adults.

SERUM ADIPONECTIN DISTRIBUTION AND ITS INFLUENCING FACTORS OF COMMUNITY PEOPLE OVER THE AGE OF 50 IN JIANGSU, CHINAL. Zhou¹, Y. Lu¹, K.J. Zhang², Y.Y. Cao¹, Y.Q. Gao³, X.F. Yu³, J. Zhu⁴, X.B. Dai³, W.C. Du¹, Z.Y. Chen³

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Aims: To investigate the serum adiponectin level of middle and old age people in community and its related factors.

Methods: Questionnaires and serum adiponectin determination with ELISA were performed for receiving routine health examination people aged 50 years and over in four communities of Nanjing and Yizheng cities, Jiangsu, China.

Results: The average level of serum adiponectin of 963 peoples was 7.23 ± 2.80 mg/L. The difference of average level of serum adiponectin between people aged 50-59 years (7.38 ± 2.83 mg/L) and aged more than 60 years (7.13 ± 2.79 mg/L) was no significant ($t=1.03$, $P=0.759$). The difference of average level of serum adiponectin between men (7.23 ± 2.81 mg/L) and women (7.17 ± 2.79 mg/L) was no significant ($t=1.01$, $P=0.914$). People with Type 2 Diabetes Mellitus (T2DM), hyperlipemia, coronary heart disease or abdominal obesity had a significant higher percentage of low serum adiponectin levels (graded by quartile range) than those without such factors respectively (all $P < 0.05$). With non-conditional multiple logistic regression analysis, abdominal obesity [OR(95%CI)=2.65(1.89-3.73), $P < 0.001$], overweight (BMI) [OR(95%CI)=1.88(1.37-2.59), $P < 0.001$], T2DM [OR(95%CI)=1.91(1.32-2.76), $P < 0.001$], hypertensive [OR(95%CI)=1.33(1.01-1.76), $P=0.045$] were associated with low serum adiponectin levels (lower than median: < 6.20 mg/L). There was no significance in the relationship among age, gender, drinking, smoking, hyperlipemia, coronary heart disease and low serum adiponectin levels.

Conclusions: Low serum adiponectin levels may be associated with the risk of T2DM, abdominal obesity and overweight in middle and old age people.

POSTER SESSION 2:

Ethnicity

ETHNICITY, CARDIOVASCULAR DISEASE AND DIABETES:
A COMPARISON BETWEEN SOUTH ASIANS AND ANGLO
AUSTRALIANS IN MELBOURNE

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Background: South Asians (SA) residing in their native country have triple the risk of developing cardiovascular disease (CVD) compared to their Anglo Australian (AA) peers living in Western society. The prevalence of diabetes, cardiovascular risk factors & severity of CVD in South Asians living a western lifestyle is unknown. We aim to document diabetes, CVD risk factors & severity in Australian dwelling South Asians as well as Anglo Australians, presenting with diagnosed CVD.

Aims: We aimed to assess the incidence of Diabetes Mellitus, cardiovascular risk factors and coronary artery disease severity in Australian dwelling Sri Lankan, Indian and Anglo Australian populations with established coronary artery disease using a comprehensive retrospective case audit and detailed scoring of angiograms.

Methodology: A retrospective audit of 182 patient's medical records admitted with diagnosed CVD (2005-2006). Baseline characteristics, diabetes status & CVD risk factor prevalence were recorded for patients of South Asian & Anglo Australian heritage. Available coronary angiograms were analysed for vessel score (number of vessels with >75% stenosis, 0-3) & stenosis severity/extent score (modified Gensini).

Results: South Asians had a lower mean age of CVD presentation (52yrs ± 8.9 SA vs. 55yrs ± 9.3 AA, p=0.02). Average BMI was lower for South Asians (26kg/m² ± 3.6 vs. 29kg/m² ± 6, p=0.005) & documented prevalence of diabetes was higher for SAs (57% vs. 31%, p=0.001). 160 patients (88% SAs & 87% AAs, p = NS) underwent coronary angiography. Median vessel score showed no significant difference; 1 (1-2) SA vs 2 (1-3) AA; p=NS. Median Gensini score was comparable in both groups; 43.5 (27-75) SA vs. 44 (26.5-68.5) AA; p=NS.

Conclusion: Compared to Anglo Australians, South Asians present with CVD at a younger age, have lower BMI, have higher rates of documented diabetes and similar severity of coronary disease. However, there appear to be no differences in rates of invasive coronary angiography.

ETHNICITY AND NON ADHERENCE TO DIETARY ADVICE: CULTURAL
COMPETENCE

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Background: South Asians (SA) residing in their native country have triple the risk of developing cardiovascular disease (CVD) compared to their Anglo-Australian (AA) peers living in Western society. High tertile of waist to hip ratio, history of hypertension and diabetes are more common among SA populations compared to other populations. There are over 200,000 SAs resident in Australia. In a retrospective case audit conducted at Victoria's largest health service, we compared SA patients to AA patients who had established CVD. It was found that SA have earlier onset of CVD, lower BMI as well as higher rates of Type 2 diabetes. However, this comparison audit could only provide evidence of differing patterns of disease rather than providing explanations for their occurrence.

Aims: We aimed to elicit and examine SA and AA participants' perceptions of risk, their own health related behaviours and interactions with the Australian health care system.

Methods: We conducted a cross sectional study using in-depth, semi-structured, audio-recorded interviews with 45 participants who were members of these communities. This data collection method was used to profile health related behaviours and garner explanations as to why these patterns occurred. Maximum variation sampling was used and required multiple recruitment methods. Content and thematic analyses were performed on verbatim transcripts of interviews.

Results: This paper discusses preliminary findings related to SAs attitudes to and perceptions of dietary advice. Key themes indicate that a "one-size-fits-all" health promotion strategy is regarded with disdain by members of these populations. Participants expressed disgruntlement with traditional advice from health professionals including doctors and dietitians. Most frequently mentioned concerns were that the dietary changes suggested were either culturally inappropriate or culturally unknown. Patients were keen to achieve better health outcomes and indicated that they would be more adherent to medical advice if it were perceived to be not only financially and pragmatically feasible but culturally relevant.

Conclusions: These results indicate that risk factors are only modifiable if the modifications recommended are culturally relevant. Health professionals require specialised training to provide optimal, effective advice in ethnically diverse communities in order to increase chances of patient adherence to advice.

Genetics

RELATIONSHIP BETWEEN ADIPONECTIN +45T/G POLYMORPHISM AND METABOLIC RISK PROFILES AMONG SCHOOL CHILDREN IN TAIWAN

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Aims: Adiponectin, a adipokine with antiinflammatory and insulin-sensitizing properties, has an important role in glucose metabolism and is negatively correlated with body fat amount in human. The purpose of this study was to examine the association of the adiponectin +45T/G (rs2241766) polymorphism on metabolic risk profiles among school children in Taiwan.

Methods: After multi-stage sampling, we selected 932 school children (453 boys and 479 girls) with average 13.1 years old in Taiwan. We measured metabolic profiles including body height, body weight, waist circumference (WC), systolic blood pressure (SBP), diastolic blood pressure (DBP), total cholesterol (CHOL), triglyceride (TG), high-density lipoprotein-cholesterol (HDL-C), and glucose levels. We genotyped adiponectin +45T/G polymorphism used TaqMan 5' nuclease assay.

Results: The frequency of adiponectin +45T/G genotype TT, TG, and GG was 53.6%, 39.1%, and 7.3% in boys and 49.7%, 42.0%, and 8.3% in girls ($p=0.47$ for boys vs. girls). In girls, the G-allele carriers had larger BMI and WC when compared with TT genotype (all $p<0.05$). In boys, the odds ratio of high SBP and DBP for G-allele carriers was 1.77 (95% CI: 0.95~3.32, $p=0.07$) and 2.09 (95% CI: 1.12~3.91, $p=0.02$) respectively, when compared with TT genotype. The odds ratio of abnormal blood pressure (high SBP or DBP) for G-allele carriers boys was 1.95 (95% CI: 1.18~3.24, $p=0.01$) when compared with TT genotype boys.

Conclusions: The adiponectin +45T/G genotype is associated with abnormal anthropometric measures and higher blood pressure. The G-allele carriers boys had higher BP and the G-allele carriers girls had larger BMI and WC. Adiponectin gene polymorphism may be one of the genetic markers to predict cardiometabolic risk among school children in Taiwan.

Keywords: Children, metabolic risk, adiponectin, polymorphism.

SEX-SPECIFIC ASSOCIATION BETWEEN LEPTIN RECEPTOR POLYMORPHISMS AND LEPTIN LEVELS AND BMI IN HEALTHY ADOLESCENTS

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Background and aim: The leptin receptor (LEPR) plays an important role in the regulation of body weight. Polymorphisms in the LEPR gene have been associated with obesity-related phenotypes, though inconsistencies in population characteristics have made for reports showing contradictory results in adults. In our study, we examined the relationship of three common

polymorphisms in the LEPR gene (Q223R, K109R and K656N) with leptin levels, BMI and presence of overweight or obesity in a population-based sample of healthy pubertal children in Spain.

Subjects and methods: The study included 807 boys and girls aged 12-16 years whose anthropometrical data were measured and body mass index (BMI) was calculated. Serum leptin and adiponectin levels were determined by ELISA and LEPR polymorphisms were determined by TaqMan® allelic discrimination assays.

Results: When analyzing the Q223R polymorphism, we observed that leptin levels were significantly lower ($p=0.049$) in boys carrying the rare R allele (QR/RR) than in those who were non-carriers (QQ); on the other hand, girls carrying the RR genotype had significantly higher leptin levels ($p=0.016$) and BMI ($p=0.032$) compared to QR girls. Furthermore, the frequency of the RR genotype in overweight-obese girls was significantly higher than that found in normal-weight girls, while no differences were detected in genotype distribution among boys.

Conclusions: The fact that the Q223R polymorphism in the LEPR gene is associated with leptin levels in a manner that differs between boys and girls, and that it is associated with BMI only in girls, suggests a sex-specific influence of this polymorphism on these variables.

THE FTO GENE POLYMORPHISMS ARE ASSOCIATED WITH OBESITY AND THE METABOLIC SYNDROME IN THE CHINESE POPULATION

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Objectives: Obesity is an important risk factor for type 2 diabetes and cardiovascular diseases. The fat mass and obesity-associated gene (FTO) was recently identified as a susceptibility locus for both obesity and type 2 diabetes by genome-wide association studies in several European populations. In this study, we investigated the association between FTO gene polymorphisms and obesity as well as metabolic syndrome.

Methods: We genotyped five single nucleotide polymorphisms (SNP) (rs1421085, rs17817449, rs8050136, rs9909609, and rs9930506) of the FTO gene in 135 obesity subjects (BMI \geq 27) and 216 normal weight control subjects (BMI $<$ 24) recruited from a health survey at the clinics of General Medicine and Metabolism in a university teaching hospital.

Results: All five SNPs were significantly associated with obesity in our study (rs1421085, $p=0.008$; rs17817449, $p=0.009$; rs8050136, $p=0.013$; rs9939609, $p=0.007$; rs9930506, $p=0.002$). The five SNPs were in strong linkage disequilibrium with r^2 ranging from 0.52 to 0.97. We further investigated their association with metabolic syndrome and also found the rs9909609 A allele and rs9930506 G allele were significantly associated with the increase of waist circumference and lower levels of HDL cholesterol. Haplotype analysis also revealed that the CGAAG haplotype carriers had increased risk to become obesity compared with the other haplotype carriers (OR=1.70, 95% C.I. = 1.03-2.80).

Conclusions: In conclusion, our results suggest the polymorphisms of the FTO gene are significantly associated with obesity and BMI, and increased risk of lower levels of HDL cholesterol. We validated the association between FTO gene polymorphisms and obesity in the Chinese population.

BIOLOGICAL PATHWAY-BASED GENOME-WIDE ASSOCIATION ANALYSIS IDENTIFIED THE VASOACTIVE INTESTINAL PEPTIDE (VIP) PATHWAY IMPORTANT FOR OBESITY

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Recent genome-wide association (GWA) studies have identified a number of novel genes/variants predisposing to obesity. However, most GWA studies have focused on only a few statistically most significant individual SNPs/genes without considering potential biological interplay of the tested genes. In this study, we performed biological pathway-based GWA analysis for body mass index (BMI) and body fat mass. We used individual level genotype data generated from 1,000 unrelated US Caucasians that were genotyped for ~500,000 SNPs. Statistical analysis of pathways was performed using a modification of the Gene Set Enrichment Algorithm (GSEA). A total of 963 pathways extracted from the BioCarta, KEGG, Ambion GeneAssist, and Gene Ontology (GO) databases were analyzed. Among all the analyzed pathways, the vasoactive intestinal peptide (VIP) pathway ranked the top for fat mass (nominal $p = 0.0009$) and the third for BMI (nominal $P = 0.0006$). After multiple testing correction, the VIP pathway achieved values of 0.042 and 0.120 for fat mass and BMI, respectively. Our study for the first time demonstrates that the VIP pathway may play an important role in development of obesity. The study also highlights the importance of pathway-based GWA analysis in identification of additional genes/variants for complex human diseases.

NEGR1, SEC16B, TMEM18, ETV5/DGKG, GNPDA2, LIN7C/BDNF, MTCH2, BCDIN3D/FAIM2, SH2B1, FTO, MC4R AND KCTD15 VARIANTS AND OBESITY IN 7705 CHINESE SUBJECTS

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Objective: Recent genome-wide association studies have identified multiple novel loci associated with obesity in Europeans. We hypothesized that these genetic variants may be associated with obesity and type 2 diabetes (T2D) in Chinese.

Research design and methods: We examined 14 associated single nucleotide polymorphisms (SNPs) at 12 loci (*NEGR1*, *SEC16B*, *TMEM18*, *ETV5/DGKG*, *GNPDA2*, *LIN7C/BDNF*, *MTCH2*, *BCDIN3D/FAIM2*, *SH2B1*, *FTO*, *MC4R* and *KCTD15*) in 605 healthy adults, 1087 healthy adolescents and 6013 T2D patients from Hong Kong.

Results: The European at-risk alleles at five loci including *GNPDA2*, *BCDIN3D/FAIM2*, *SH2B1*, *FTO* and *KCTD15* were significantly associated with increased BMI, waist circumference ($4.5 \times 10^{-9} < P < 0.024$) and/or obesity risk (OR = 1.14-1.22, $2.0 \times 10^{-5} < P < 0.002$) in our Chinese populations. The former four loci as well as *LIN7C/BDNF* were also associated with T2D risk (OR = 1.09-1.22, $0.008 < P < 0.041$) but the associations were lost after adjustment for BMI, suggest their role in T2D risk are mediated through modulation of adiposity. Joint effect analyses of the five adiposity loci revealed an increase of ~0.29 kg/m² in BMI with each additional copy of at-risk allele ($P_{trend} = 4.2 \times 10^{-12}$).

Conclusions: Our findings support the important contribution of *GNPDA2*, *BCDIN3D/FAIM2*, *SH2B1*, *FTO* and *KCTD15* in the regulation of adiposity, which in turn affect T2D risk in Chinese.

LEPTIN (OB) GENE: CORRELATION OF GENOTYPE WITH CLINICAL AND ANTHROPOMETRIC PARAMETERS SEEN IN TYPE2 DIABETES MELLITUS

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Objective: Adipose tissue biology and metabolic abnormalities are two ends of same process. OB gene which is expressed in adipose tissue can be seen as candidate gene for diabetes. Our objective was to understand the molecular mechanism underlying the relationship between obesity and type 2 diabetes.

Methodology: In this case-control study 29 diabetic and 30 controls were enrolled for OB gene study. Patients were randomly selected and study was institutional ethical committee approved. Each subject's clinical, biochemical and anthropometric data was recorded. Blood was drawn in 5ml EDTA tube and then DNA was isolated using Millers protocol. Extracted DNA was further amplified and amplicons were checked on 12% PAGE. Simple sequence length polymorphism for D7S1875 (repeat of OB gene) was carried out and final product was evaluated.

Result: Mean age, height and weight were non significant in all subjects. Mean BMI was 27.34 ± 4.62 and 24.08 ± 4.11 in case and control respectively, whereas WHR was 0.98 ± 0.06 and 0.88 ± 0.05 respectively. Significant difference was observed in WHR. In distribution of D7S1875, 14 cases were of >15->15 and 15 had < 15->15 repeat sequence. Whereas in control 9 had >15->15 and 21 had < 15->15. Statistical significant difference for >15->15 repeats between case and control was observed signifying association of type2 diabetes with this pattern.

Conclusion: OB gene pattern of >15->15 repeat is strongly associated with type 2 diabetes and derangements in BMI and WHR.

ASSOCIATION OF THE *PRO12ALA* POLYMORPHISM OF PEROXISOME PROLIFERATOR ACTIVATED RECEPTOR- γ (PPAR- γ) GENE WITH OBESITY AND INSULIN RESISTANCE IN ASIAN INDIANS

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Background: PPAR γ has a key role in adipocyte differentiation and function, lipid and glucose metabolism. Asian Indians have an increase tendency to develop abdominal obesity and insulin resistance. This study evaluated the relationship of *Pro12Ala* polymorphism of PPAR γ gene with obesity and insulin resistance in northern Asian Indians.

Methods: This cross-sectional study included 514 nondiabetic subjects (292 males, 222 females) 18-60 yrs of age from various residential colonies of New Delhi, India. Measurements included anthropometry and biochemical (fasting glucose, lipids and fasting insulin) parameters. *Pro12Ala* polymorphism of PPAR- γ gene was identified by PCR and RFLP analysis. The effect of this polymorphism on anthropometric and biochemical measurements was investigated. Obesity was defined as BMI ≥ 23 kg/m², abdominal obesity as waist circumference (WC) >90 cm in males and >80 cm in females, and insulin resistance was defined as fasting insulin >10 μ U/ml in males and >11 μ U/ml in females (highest quartile).

Results: Allelic frequencies of the *Pro* and *Ala* alleles were 0.89 and 0.10, respectively. About 14.8% subjects were heterozygous and 2.9% were homozygous for the *Pro12Ala* polymorphism, with no gender differences. Obesity was present in 64%, abdominal obesity in 54% and insulin resistance in 22.2% subjects. Fasting insulin was significantly higher in subjects with *Ala/Ala* genotype as compared to those with *Pro/Pro* ($p=0.04$) and *Pro/Ala* ($p=0.01$) genotype. The frequency of *Ala/Ala* genotype was higher in insulin resistant subjects as compared to those with normoinsulinemia (8% vs. 1.5%, $p=0.001$). Mean levels of BMI, WC and subscapular skinfold thickness were higher in subjects with *Ala/Ala* genotype ($p < 0.05$ for all) as compared to *Pro/Pro* and *Pro/Ala* genotypes. The frequency of *Ala/Ala* genotype, though higher in subjects with obesity and abdominal obesity, was statistically not significant.

Conclusion: *Pro12Ala* polymorphism of PPAR- γ gene may influence insulin resistance and obesity in Asian Indians. Higher levels of obesity parameters and fasting insulin were noted in subjects with noted in *Ala/Ala* genotype as compared to the wild and the heterozygous form of the PPAR- γ gene.

Hypertension

GENDER DIFFERENCE IN ASSOCIATION OF BLOOD PRESSURE WITH OBESITY INDICES: WHO IS AT GREATER RISK

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Objective: The aim of the present study is to investigate the Blood Pressure (BP) levels and their association with different indices of body fat in adult Baniyas males and females and compare the same.

Method: Data was collected on 572 adults (309 females and 261 males), aged 25-60 years in an endogamous group of Delhi, India. Data includes obesity related anthropometric measurements and blood pressure using standardized procedure. Analysis yielded crude and sex-specific prevalence estimates for various BP categories. Correlation was calculated between Systolic and Diastolic BP and various indices of obesity. Further, Odds ratios for association of pre-hypertension with obesity indices was obtained using Multiple Logistic Regression.

Results: The prevalence of Pre-hypertension and hypertension was found higher among males (48.7% & 21.6%) than females (45.6% & 7.4%) whereas prevalence of obesity show opposite trend with 42.7% of females obese compared to 21.2% obese males. Correlation of BP was found to be significant for all indices of obesity. The odds of hypertension were found to be higher in males than females for all the indices of obesity except for BMI > 30 . For males, the odds of getting hypertensive was found to be highest with WHR > 0.95 whereas in female it was found to highest for BMI > 30 .

Conclusion: Although obesity is found to be higher among females, males were found to be at higher risk of hypertension. High odds of obesity indices indicates that optimum cut-off should be calculated for screening the people who are at risk of getting hypertensive and thus are at the greater risk of developing cardiovascular diseases.

ASSOCIATION OF A GENETIC VARIANT IN THE ADIPONECTIN GENE WITH PERSISTENT HYPERTENSION IN HONG KONG CHINESE

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Introduction: Adiponectin is an adipokine with insulin-sensitizing, anti-inflammatory, and anti-atherogenic properties. Low circulating levels have been shown to predict the development of hypertension in Hong Kong Chinese. We therefore investigated if single nucleotide polymorphisms (SNPs) in the gene encoding adiponectin are associated with hypertension.

Methods: 14 tagging SNPs were genotyped in 1936 subjects, from the Hong Kong Cardiovascular Risk Factor Prevalence Study-2 (CRISPS-2). Plasma adiponectin level was measured in 1650 subjects.

Results: Among all the 1936 subjects, none of the SNPs was significantly associated with prevalent and incident hypertension. However, in the sub-cohort of 1616 subjects who were consistently normotensive or hypertensive during the 6.4-year follow-up period, the minor G allele of the SNP rs266729 was significantly associated with a higher odds of hypertension (odds ratio [95% CI] = 1.49 [1.13-1.95], $P = 0.0044$) after adjusting for covariates, which remained significant after correction for multiple testing. Age ($P < 0.001$), body mass index ($P < 0.001$), HOMA-IR ($P < 0.001$), triglycerides ($P = 0.020$), and rs266729 ($P = 0.020$) were significant independent factor of hypertension in multiple logistic regression analysis. The minor allele of SNP rs266729 was also significantly associated with lower adiponectin level ($\beta = -0.071$, $P = 0.0008$) after adjusting for covariates.

Conclusions: In our population, the SNP 266729, associated with lower adiponectin level, showed a significant association with persistent hypertension. Further studies on the genetic association of adiponectin with hypertension are warranted.

THE CROSS SECTIONAL STUDY OF ANTHROPOMETRIC PARAMETERS IN YOUNG HEALTHY INDIVIDUALS HAVING PARENTAL HISTORY OF HYPERTENSION

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Background: The adverse association of cardiovascular risk factors in both children and adults with parental history of disease is well recognized. A family history of hypertension has been shown to be a risk factor for the subsequent development of disease. This study is aimed to compare any observed differences in the mean BPs, BMI, Hip waist ratio in children of hypertensive and normotensive parents.

Methodology: A cross sectional study was conducted among the 100 students of faculty of medicine of a University. Blood pressure and anthropometric measurements were taken.

Results: Among the 100 participants studied, 63% were male and the average age was 19.76 years (SD ±2.01) with a median of 20 years, varying from 18 to 24 years. The mean systolic blood pressure in males with history of hypertensive parents was 131.7 ± 13.5 as against 121.2 ± 10.1 in females with history of hypertensive parents. The difference was statistically significant (p< 0.002). The mean diastolic blood pressure was also significantly higher in males with history of hypertensive parents than females with history of hypertensive parents (86.2 ± 11.3 in males versus 78.7 ± 10.3 in females). The BMI positive correlation with systolic blood pressure (SBP) and diastolic blood pressure (DBP) was found.

Conclusion: The findings of the present study suggest the need of monitoring the BP of children of hypertensive parents. Health care providers, therefore have an important role to play in educating families and children about approaches that are useful in preventing hypertension.

WAIST CIRCUMFERENCE AND HYPERTENSION IN HONG KONG CHINESE CHILDREN

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Objectives: To determine the association between waist circumference (WC) and hypertension in Chinese children aged 6-18 in a territory wide school based screening program in Hong Kong.

Method: Cross sectional anthropometric and oscillometric blood pressure (BP) measurements were done as part of a growth survey¹ in 2006 of school students randomly selected from 36 primary and secondary schools in the

18 districts of Hong Kong. As part of the survey which collected anthropometric and lifestyle information from the school children, blood pressure was measured by Datascope Accutorr Plus, an oscillometric device previously validated with mercury sphygmomanometer in children.² Hypertension was defined as BP≥95 percentile for gender and age.³ The association between WC and hypertension was assessed using logistic regression.

Results: Amongst 14,842 aged 6-18 children screened, prevalence of hypertension was 8.5% (674 boys and 592 girls). WC (OR = 1.022, P = 0.011) was significantly correlated with hypertension adjusted for age, gender and BMI.

Conclusion: We believe our study, with a large sample size of randomly selected children, provides a reliable evidence of effect of increased waist circumference on hypertension in Hong Kong Chinese children.

	B	SE	P	OR	95% CI for OR	
					Lower	Upper
Age	0.059	0.010	<0.0001	1.060	1.040	1.081
Boys	0.102	0.065	0.117	1.107	0.975	1.258
CV	0.022	0.009	0.011	1.022	1.005	1.040
BMI	-0.171	0.020	<0.0001	0.843	0.811	0.876
Constant	3.516	0.237	<0.0001	33.643		

[Logistic regression model]

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RISK FACTORS OF STROKE AMONG HYPERTENSIVE PATIENTS IN SOUTHERNMOST THAILAND, 2009

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Background: Hypertensive patients (HT) have high risk for developing stroke and heart disease. Bomb and shooting due to political turmoil has been affecting health service in the deep south of Thailand. There is no study about the stroke prevalence and risk factors among HT in this population before.

Objective: To determined the prevalence of stroke and risk factors that associated with stroke among HT.

Methods: Cross-sectional study was conducted in 2009. Multi-stage cluster sampling was performed. Simple random sampling was done to select 4 out of 7 provinces in the southernmost. One provincial hospital (PH), 3 community hospitals (CH), and 3 primary health care units (PCU) were selected from each province. We selected 100, 50, and 50 HT patients from each PH, CH, and PCU, subsequently. A total of 1,606 HT participated in the study. The participants had anthropometry measurement (Waist circumference in centimeter, weight in kilogram, height in meter), blood pressure measurement (mmHg), and face-to-face interview. We reviewed medical records about heart disease, stroke, blood pressure, lipid profile, and fasting blood sugar (FBS).

Results: The mean age of HT was 61 ± 11.45 years. The majority of the HT were female (29.11%), married (75.10%), had primary education or less (84.20%), agriculture occupation (32.60%). The prevalence of stroke among males and females were 4.10% and 3.30%, subsequently. The proportions of patients who had BMI ≥ 25 kg/m², cholesterol ≥ 200 , LDL ≥ 100 , HDL ≤ 40 , and FBS ≥ 110 were 48.50%, 57.0%, 76.1%, 29.3%, 35.3%, and 78.50%, subsequently. When compare to HT without stroke patients, HT with stroke patients were more likely to have history of heart disease (RR=3.01, 95% CI=1.34-6.78), poor follow up rates (RR=2.49, 95% CI=1.25-4.95), and uncontrolled hypertension (RR = 1.76, 95% CI=1.05-2.59).

Conclusions: The prevalence of stroke among the HT patients in the deep south was high. The patients had high prevalence of risk factors, including obesity, dyslipidemia, and high FBS. The controllable risk factors that statistically significant associated with stroke were poor follow up rate and uncontrolled hypertension. Thus, health care providers should adjust the services according to the context.

ASSOCIATION BETWEEN METABOLIC SYNDROME AND 24-HOUR BLOOD PRESSURE MEASURES IN HYPERTENSIVE OUTPATIENTS

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Objectives: Evidences has shown 24-hour of blood pressure circadian rhythm measures as proxy variables of cardiovascular outcomes. This study investigates the metabolic syndrome (MS) as possible predictor of five outcomes derived from ambulatory 24 hour blood pressure values:

1. At least three of the following conditions, systolic blood pressure/diastolic blood pressure $\geq 140/90$ mmHg, decline in sleep BP, pulse pressure (PP ≥ 53 mmHg,
2. 24-hour pulse pressure (24h PP ≥ 53 mmHg),
3. night-time pulse pressure (night-time PP ≥ 53 mmHg),
4. daytime pulse pressure (daytime PP ≥ 53 mmHg) e 5) decline in night-time BP.

Methods: A cross-sectional study was conducted at the university teaching hospital with hypertensive outpatients linked to educational, self-care, control, and secondary prevention of disease programs, and to the Family Health

Program in the city of Belo Horizonte, in Brazil. Sample was composed with 116 individuals of both sexes aged between 29 and 83 years with hypertension diagnose.

Results: PP24h, daytime PP and night-time PP were elevated in more than 54% of the patients and 44% presented higher risk for cardiovascular disease (CVD). Various risk factors were investigated, such as: hipertrigliceridemia (52%), low HDL-c (72.8%), abdominal obesity (60.3%), metabolic syndrome (58.1%), dyslipidemia (88.8%), overweight (74.3%) and obesity (33.8%). Logistic regression analysis showed that MS and age over 60 years were associated to at least three altered 24-hour parameters (OR = 4,5 e OR = 3,6), to 24h PP (OR=2,3 e OR= 4,7) and to daytime PP (OR=2,2 e OR=4,60), respectively.

Conclusions: MS and age were important factors associated to altered blood pressure circadian rhythm in patients with hypertension. This condition has been pointed out as potential causes of cardiovascular events.

Inflammation

INFLAMMATION MARKERS AT THE PATIENTS WITH ABDOMINAL OBESITY THE REPUBLICAN SPECIALIZED CENTRE OF SURGERY, TASHKENT, UZBEKISTAN

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The research purpose is determination of some inflammation markers at the patients hospitalized for surgical treatment on the occasion of pathological obesity of the abdominal type (POAT).

Laboratory researches were carried out before the operation at 10 patients with POAT with the body weight index greater than 40 kg/m² in the age of 40-55 years. In the blood of patients we determined the content of basic parameters of lipidic spectrum: glucose, uric acid, malonic dialdehyde, blood serum total antioxidant activity (AOA), C-reactive protein (CRP), albumin, fibrinogen, erythrocyte sedimentation rate (ESR), total amount of leukocytes. The control group consisted of 10 healthy volunteers.

Revealed dislipemia, increase of glucose average level in the blood of patients up to 125,6 % (P< 0,02), uric acid up to 157,6 % (P< 001) against the control group allows to assume development of metabolic syndrome at the given patients with POAT. The content of malonic aldehyde, the final product of the peroxidation of lipids, rose by 1,9 times while AOA was reduced by 1,6 times (P< 0,05).

CRP concentration, positive reactant of the liver acute phase (LAP), 2,7 times exceeded control value (P< 0,001). In the content of other proteins of the LAP: albumin and fibrinogen statistically reliable changes were not registered. The total amount of leukocytes approximated to the superior limit of norm, ESR exceeded it, making $20,0 \pm 3,1$ mm/s.

Thus, at the patients with POAT, the presence of attributes of the chronic subclinical inflammation, typical for the course of atherosclerotic process was revealed.

PROTECTIVE EFFECT OF CURCUMA LONGA (TURMERIC) EXTRACT ON EXPERIMENTALLY INDUCED ARTHRITIS IN SPRAGUE DAWLEY RATS: A MACROSCOPICAL AND RADIOLOGICAL STUDY

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Rheumatoid arthritis (RA) is a chronic autoimmune disease which causes systemic inflammatory changes that leads to the destruction of the joints. In Malaysia, it is known to affect about 5 in 1000 individuals and 75% are women. Curcuma longa (CL) is a rhizomatous perennial plant of the Zingiberaceae (ginger) family that is widely found in Malaysia. A total of 36 male (150±50g) Sprague Dawley rats were divided equally into six different groups. Five groups were immunized with 150µg collagen II on day 0 and the remaining group was kept as a normal control. Rats with established CIA (arthritis score exceeding 1) were treated orally with betamethasone (0.5 mg/ml/kg body weight), olive oil (1.0 ml/kg body weight), turmeric extracts (doses of 30, 60 and 110 mg/ml/kg body weight), beginning on day 13 or day 14 until day 28 following immunization, on a daily basis. Arthritic scoring of the paws, measurement of paw thickness, white blood cell (WBC) count and radiological scoring was performed. CL extract treatment reduced the inflammatory changes in a dose dependent manner. WBC count was elevated in untreated CIA animals. Radiographs showed marked soft tissue inflammatory changes in the untreated CIA rats as compared to the CL treated rats. The study is first of its kind in observing both macroscopic changes and the radiological findings concurrently. The results showed that administration of CL extract proved to be beneficial in arresting the degenerative changes in the bone and joints of RA.

PLASMA AND TISSULAR CRP LEVELS IN MORBIDLY OBESE PATIENTS DECREASED AFTER GASTRIC BY PASS

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Objective: As high plasma levels of C-reactive protein (CRP), a marker of inflammation, are documented in patients with morbidly obesity and recently, obesity is considered as a pro-inflammatory state, we want to study the CRP sources in morbidly obese people and their evolution during one-year follow-up period after a Roux-en-Y gastric by pass.

Methods: We determine CRP in plasma and biopsies from liver (L), visceral (ATvc) and subcutaneous (ATsc) adipose tissues taken from 30 patients with BMI > 40 Kg/m² who underwent Roux-en-Y gastric by pass. Samples (plasma and biopsies) from normal weight people (NW) were taken as control. Plasma samples were analyzed by immunoturbidimetry (Gernon) and tissues by ELISA (Immundiagnostik).

Results: Obese people had three-times more plasma CRP than NW group, but along the one-year follow-up period it decreased up to NW levels. Liver CRP in the obese group was 18-times higher than control, and one year after surgery it normalized. ATvc and ATsc from obese had, respectively,

6 and 5-times more CRP than NW. At 6 months ATsc CRP values were 3-times lower than obese and one year after surgery they reached control values. There were positive correlations ($r=0.63$; $p<0.001$) between plasma and liver CRP. Besides, there were also positive and significant ($p<0.001$) correlations between plasma CRP and ATvc ($r=0.59$), ATsc ($r=0.58$) and between liver and ATsc ($p<0.001$; $r=0.60$). No correlations were observed between ATvc and ATsc CRP.

Conclusions:

- The high plasma CRP levels observed could be the consequence of an increased production of this cytokine in liver and/or adipose depots.
- One year after gastric by pass, plasma and tissular CRP levels reach normal weight values.
- The plasma CRP values could be a very good index of tissue inflammation.

Interventional cardiology

ATHEROSCLEROTIC PLAQUE COMPOSITION IN RENAL ARTERIES: A PRELIMINARY STUDY WITH IMPLICATIONS FOR RENAL ARTERY STENTING IN DIABETIC VERSUS NON-DIABETIC PATIENTS

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Background: The clinical importance of atherosclerotic plaque composition in the renal arteries is poorly defined. Furthermore, it is unclear whether a difference exists in individual plaque components between diabetic and non diabetic individuals with hypertension. The purpose of the present study was to characterize RAS plaque composition by intravascular ultrasound virtual histology (IVUS-VH) and to explore the relationship between individual plaque components and change in renal perfusion following renal artery stenting as assessed by renal frame count (RFC).

Methods: 14 atherosclerotic lesions (in 13 hypertensive patients, 5 of which were diabetic) undergoing percutaneous renal artery angioplasty and stenting were evaluated. Automated IVUS pullbacks at 0.5 mm/sec were performed prior to stenting, with determination of VH plaque composition. RFC was determined before and after stenting.

Results: The VH analysis of the segment demonstrated mostly fibrous tissue ($57.4 \pm 12.0\%$), followed by lipid/necrotic core ($20.4 \pm 8.4\%$), fibrofatty ($8.4 \pm 4.1\%$), and dense calcification ($13.8 \pm 7.1\%$). For the segmental analysis, negative correlation between % fibrous plaque and change in RFC ($r=-0.65$, $P=0.012$), and a positive correlation between % necrotic core and change in RFC was observed ($r=0.58$, $P=0.036$). While there was no significant difference in plaque composition between diabetics and non diabetics, the diabetic subjects trended towards more necrotic core as compared with the non-diabetics (18% vs 11% , $P=0.09$). The correlation with % necrotic core and change in RFC was strongest in diabetic patients ($r=0.98$, $P<0.001$).

Conclusions: Both the MLD frame and segmental analysis of RAS lesions demonstrate predominantly fibrous tissue with smaller amounts of necrotic core, fibrofatty tissue, and dense calcification. Diabetic patients may have more contribution of lipid in their renal atheroma lesions. Renal plaque composition is associated with change in RFC after stenting and may be of particular importance in diabetics.

Lipids/Lipoproteins

COMPARISON OF THE EFFICACY OF FIBRATES ON HYPERTRIGLYCERIDEMIC PHENOTYPES HAVING DIFFERENT GENETIC AND CLINICAL CHARACTERISTICS

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Aims: PPAR alpha agonists (fibrates) are known and effective plasma triglycerides lowering agents. Several subtypes of hypertriglyceridemia (hyperTG) have been described (type I, IIb, III, IV and V) and modulate the risk of disease. These subtypes differ by their prevalence, burden, genetic backbone and clinical expression. Type I hyperTG is a mendelian subtype not associated with abdominal obesity which confers an increased risk of pancreatitis whereas type III hyperTG, associated with abdominal obesity and the apo E2-2 genotype, confers an increased risk of atherosclerosis. Intervention on the diet and life habits is systematically required to manage the risk associated with all hyperTG subtypes and a medication is often prescribed.

Methods: We have compared the effect of fibrates on the lipid profile of 122 individuals with different hyperTG subtypes: 12 with type I or type V hyperlipidemia (TG>10 mmol/L), and 110 with moderate hyper TG (2-9 mmol/L): 55 with type III and 55 with type IV or IIB dyslipidemia.

Results: The response to fibrate therapy differed significantly between the studied hyperTG subtypes: patients with type I did not respond at all whereas patients with type III responded significantly better ($p < 0.001$) than the other subtypes on several lipid fractions including total cholesterol and non HDL-cholesterol. In all subtypes except type I, the apo E2 allele was associated with a better response than the other apo E genotypes ($p < 0.01$). Although homozygotes for null alleles in the LPL gene (type I) did not respond at all, the response of LPL heterozygotes (with type IIB, IV or V) was comparable to that of non carriers.

Conclusion: These results suggest that the response to PPAR alpha agonists treatment varies across hyperTG and waist-TG subtypes and that genetic factors contribute to modulate this effect.

WAIST CIRCUMFERENCE, INDEPENDENT OF INSULIN SENSITIVITY, IS ASSOCIATED WITH THE APOB/APOA-I RATIO IN CHINESE WOMEN

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Background: The apolipoprotein-B (apoB)/apolipoprotein-AI (apoA-I) ratio is a strong predictor for cardiovascular disease. The purpose of the study is to examine the relative influences of waist circumference (WC) and insulin sensitivity on the ratio in Chinese women.

Methods: One hundred and seventy-four Chinese women without using anti-lipid agents and hormone replacement were recruited for the study. Each subject received anthropometric measurements, fasting sampling, and a 75-g oral glucose tolerance test (OGTT). The insulin sensitivity index $ISI_{0,120}$ from the OGTT was used to surrogate insulin sensitivity.

Results: The women with larger girth (WC ≥ 80 cm) had higher values of the apoB/apoA-I ratio than the counterparts (WC < 80 cm) before and after adjustments for age, lifestyle parameters, BMI, and Log ($ISI_{0,120}$). In simple correlations, the ratio was positively correlated with WC and negatively with Log ($ISI_{0,120}$). Both WC and Log ($ISI_{0,120}$) were significantly associated with the ratio when they were entered into a regression model together. Subsequently, we found that WC independently predicted the variance of the apoB/apoA-I ratio in stepwise regression among a group of cardio-metabolic risk factors including Log ($ISI_{0,120}$).

Conclusions: Our data demonstrated that WC, independent of insulin sensitivity, was associated with the apoB/apoA-I ratio in Chinese women. The study highlights the importance of abdominal obesity *per se* to the apoB/apoA-I ratio.

CHYLOMICRON REMNANTS ARE INCREASED IN CD36 DEFICIENCY AT POSTPRANDIAL STAT

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Introduction: Human CD36 deficiency (CD36-D) is a monogenic form of the metabolic syndrome with the clustering of risk factors including dyslipidemia, hyperglycemia and hypertension. We investigated the underlying mechanism of postprandial hyperlipidemia in CD36-D.

Methods and results: We analyzed lipoprotein profiles in both CD36-D patients and CD36-knockout (CD36-KO) mice after oral fat loading (OFL). In patients, plasma TG, apolipoprotein B-48, free fatty acids (FFA) and free glycerol levels were extremely higher in the fasting state and after OFL compared with healthy subjects, along with the increase of chylomicron (CM)-remnants and small dense LDL particles. In CD36-KO mice, levels of TG, FFA, free glycerol and CM-remnants in both plasma and intestinal lymph

were markedly increased after OFL. LPL activity and CM clearance from the postprandial plasma were not impaired in CD36-KO mice. Furthermore, the mRNA levels of genes in the biosynthesis of FFA and the assembly of CM, such as fatty acid binding protein-1 and fatty acid synthase, were significantly increased, suggesting that the increase of de novo synthesis of FFA stimulated the production of CM in the intestine.

Conclusions: CD36-D might increase the risk of atherosclerosis by enhancing the plasma level of C M remnants due to the increased CM synthesis in the intestine.

EFFECTS OF CONSTITUENT AND EXTRACTED SOY ISOFLAVONES ON BLOOD LIPID PROFILES: META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Objectives: Clinical trials have reported the cholesterol-lowering effects of soy protein intake, but the components responsible are not known. We conducted meta-analyses to clarify the effects of ingesting soy isoflavones for 1-3 months on lipid profiles.

Methods: PUBMED was searched for English-language articles of randomized controlled trials (RCTs) evaluating the effects of constituent isoflavones in soy protein isolate. PUBMED, EMBASE, CENTRAL, ICHUSHI, and CNKI were searched for English, Japanese, and Chinese articles of RCTs evaluating extracted soy isoflavones alone (not ingested concurrently with soy protein).

Results: Soy protein that contained enriched isoflavones (average of 48 g soy protein containing 108 mg isoflavones per day intake) significantly decreased total cholesterol by 0.10 mmol/L (3.9 mg/dL or 1.77%; $P = 0.02$) and LDL cholesterol by 0.13 mmol/L (5.0 mg/dL or 3.58%; $P < 0.0001$), compared with isoflavone-depleted soy protein (average of 48 g soy protein containing 6 mg isoflavone); no significant effects of constituent soy isoflavones on HDL cholesterol and triacylglycerol were found. Isoflavone-depleted soy protein and soy protein that contained enriched isoflavones significantly decreased LDL cholesterol by 0.10 mmol/L (3.9 mg/dL or 2.77%; $P = 0.03$) and by 0.18 mmol/L (7.0 mg/dL or 4.98%; $P < 0.0001$) compared with animal protein, respectively. The reduction in LDL cholesterol was larger in hypercholesterolemic participants than in normocholesterolemic participants. Extracted soy isoflavones did not significantly affect total and LDL cholesterol.

Conclusions: When ingested as a constituent of soy protein for 1-3 months, soy isoflavones exert synergistic or additive cholesterol-lowering effects, especially in the hypercholesterolemic subgroup. However, supplementation of extracted soy isoflavones alone does not appear to have the beneficial effects on cholesterol.

Metabolic syndrome

INFLUENCE OF ORLISTAT ON GLYCEMIC CONTROL AND LEVEL OF ARTERIAL PRESSURE IN PATIENTS WITH METABOLIC SYNDROME

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Purpose: To examine influence of Orlistat on glycemic control and level of arterial pressure (BP) in patients with a metabolic syndrome and diabetes mellitus.

Methods: 62 patients were included in the study and were aged between 35-57 years (males and females) with a metabolic syndrome (with disturbance of glucose tolerance or type 2 diabetes, obesity and arterial hypertension).

Levels of glycemia and BP, BMI (body mass index), waist circumference, a lipid profile, hepatic tests and glycolysed hemoglobin were quantified.

Subjects were assigned to Orlistat in a dose 120mg 2-3 times a day, for 4-6 months, and prescribed a corresponding diet and physical activity.

Results: Efficiency of Orlistat was variable in the study patients. In seven of them, drug intolerance has been revealed hence Orlistat was cancelled and patients were excluded from the study.

Weight loss of patients varied depending on duration of treatment from 9 to 18 kg (4-6 months). BMI has decreased from baseline: 29-34.0 kg/m² to 27.4-29.2 kg/m². The waist circumference has decreased for 4-10 cm. In 9 patients the weight has decreased slightly (3-5 kg), which was associated with non-observance of eating regime and corresponding diet therapy.

Significant improvements in indices of glycemic control were observed with Orlistat treatment. In 47 patients with a diabetes mellitus, dose of antidiabetic drugs has decreased for one third, glycemia level has decreased to 2.9-5.3 mmol/l from baseline for 4-6 months. Level of glycolysed hemoglobin has decreased from 8.7 % + - 0.7 to 7.2 % + - 0.5.

In eight patients, antidiabetic drugs were cancelled on background of Orlistat therapy, in connection with diabetes compensation.

BP was significantly reduced by Orlistat treatment (by 10-15 mmHg). For 17 % of patients treated with Orlistat, the dose of hypotensive drugs was reduced.

Discussion: It is obvious that the metabolic syndrome is a widespread disease. As each component of this syndrome (arterial hypertension, obesity, diabetes mellitus, lipidemia) itself is a risk factor for development of cardiovascular complications, their presence represents real threat to the patient.

The intensive complex approach to treatment of this pathological condition can counteract growing prevalence of a metabolic syndrome and development of high risk in severe diseases.

Thus, adequate therapeutic approaches which should include the complex of actions for risk reduction are necessary for such patients: improvement of glucose tolerance for prevention of diabetes mellitus, BP and weight normalizations, compensation of diabetes mellitus. Orlistat was found to be an effective drug for improvement of glycemic control, normalization of BP and reduction of weight of patients.

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PREVALENCE OF METABOLIC SYNDROME AMONG KUWAITI ADOLESCENTS USING TWO CRITERIA

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Introduction: The prevalence of overweight and obesity among Kuwaiti adolescents has been reported to be high and they both are principle components of metabolic syndrome (MS). It is, therefore, expected that the prevalence of MS among this group would be high, using two different criteria.

Objectives: To assess the prevalence of MS among Kuwaiti female adolescents aged 10-19 years, using the diagnostic criteria developed by the International Diabetes Federation (IDF) and the National Cholesterol Education Program - Third Adult Treatment Panel modified for age (NCEP-ATP III).

Method: A cross-sectional random sample of 774, apparently healthy, Kuwaiti female adolescents drawn from several randomly selected schools was studied for the prevalence of MS using the above mentioned two diagnostic criteria. Anthropometric and clinical assessments included measurement of waist circumference (WC), blood pressure (BP), fasting blood glucose (FBG), high density lipoprotein (HDL) and triglycerides (TG).

Results: Using the IDF and the ATP III criteria, WC, TG, FBG, and BP were found to be increased and HDL was found to be decreased among all the subjects.

Conclusion: Even with the absence of criteria specific for Gulf Arab population, the prevalence of MS among the studied sample was high, using the two criteria. The IDF, however, tend to overestimate the prevalence of MS as compared with ATP III. Nonetheless, this require intervention measures to protect this group from especially such diseases as cardiovascular and type 2 diabetes mellitus.

OBESITY AND ITS RELATIONSHIP WITH METABOLIC SYNDROME IN MOROCCO

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Aims: The study aims was to examine the relationship between obesity and metabolic syndrome (MS) in urban Moroccan women.

Methods: Triglycerides (TG), total cholesterol, high-density lipoprotein cholesterol (HDL-c), lower-density lipoprotein cholesterol (LDL-c) and fasting blood glucose levels were assessed in a sample of women aged 25 to 55 years. Body mass index (BMI), waist to hip ratio (WHR), Waist circumference (WC) and blood pressure (BP) were also measured.

Results: Globally 36.6% of women were overweight (25≤BMI< 30 m2), 24% obese (BMI>30 m2), about 20% had WHR> 0.85 and 29% had WC ≥ 88cm. Indicators of obesity increased with age and the prevalence of co-morbid factors increased with obesity. The women with android obesity (WHR> 0.85) and central obesity (WC ≥ 88cm) had greater risk compared to those with overweight and general obesity. The prevalence of MS was 18% and increased with high BMI (31.5%) and high WHR (50%).

Conclusion: Metabolic syndrome and its co-morbidity factors are prevalent among Moroccan women aged 35years and over. The exaggerated influence of obesity in this prevalence suggests that the prevention of obesity could prevent MS and its complications.

Keywords: Obesity, metabolic syndrome, cardiovascular disease, Morocco, women.

ASSOCIATION BETWEEN PLATELET COUNT AND COMPONENTS OF METABOLIC SYNDROME IN GERIATRIC TAIWANESE MALES

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Background: Patients with metabolic syndrome (MetS) are well-known to have increasing risk of cardiovascular disease. Platelet count represents thromboembolic status and also correlates with cardiovascular disease. However, the relation between platelet count and MetS was not clear,

especially in the geriatric group. We tried to find out the relation between platelet count and MetS and put special emphasis on the Taiwanese male geriatric population in this study.

Methods: We included 1187 Taiwanese males who were over 65 years old. We excluded subjects with abnormal platelet counts in this study to reveal a more clear relation between platelet counts and MetS. Platelet counts were analyzed between subjects with and without MetS. We divided platelet counts into 4 groups according to quartiles arbitrary of platelet counts (lowest, PLT 1; highest, PLT 4). The number of MetS components was compared between platelet groups with ANOVA. We also used simple correlation and multivariate linear regression to find the relation between platelet counts and MetS components.

Results: We found that the platelet counts were higher in group with MetS but not significantly different ($p=0.675$). The fasting plasma glucose (FPG), total cholesterol, low-density lipoprotein-cholesterol (LDL-C), triglyceride (TG) and Log- triglyceride (Log-TG) were all statistically different according to 4 platelet groups. These four components were also positively correlated to platelet count in simple correlation. Not surprisingly, FPG, LDL-C, TG and Log-TG were positively correlated with platelet count in multivariate linear regression.

Conclusion: FPG, LDL-C, TG and Log-TG were positively correlated with platelet count among the MetS components in geriatric Taiwanese males. The role of HDL-C and LDL-C in the definition of MetS should be re-evaluated.

ASSOCIATION BETWEEN PLATELET COUNT AND COMPONENTS OF METABOLIC SYNDROME IN GERIATRIC TAIWANESE FEMALES

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Background: Metabolic syndrome (MetS) was found to be associated with cardiovascular disease. In the meanwhile, platelet was also found to correlate with cardiovascular disease. However, this correlation was not well documented, especially in the geriatric group. In this study, the relationships between platelet count and MetS components were investigated in geriatric Taiwanese females.

Methods: A total of 1460 Taiwanese females over 65 years old were enrolled. In order to observe the true relationships, we only enrolled normal platelet count. Other than this, subjects with diabetes, hypertension or hyperlipidemia or on medications for these 3 diseases were also excluded. Platelet counts were compared between subjects with and without MetS. They were further divided into quartiles arbitrarily according to their platelet count (lowest, PLT 1; highest, PLT 4). The MetS components were compared between these 4 groups with ANOVA. Simple correlation and multivariate linear regression were used to further explore the relationships between platelet count and MetS components.

Results: Platelet counts were different between subjects with and without MetS ($p < 0.000$). The body mass index (BMI), total cholesterol, low-density lipoprotein-cholesterol (LDL-C) and triglyceride were significantly different in

the 4 groups. These four MetS components were also positively correlated with platelet counts in simple correlation. After multivariate linear regression, BMI became non-significant. LDL-C and triglyceride were positively correlated with platelet counts.

Conclusion: In our study, LDL-C and triglyceride were positively correlated with platelet counts among the MetS components in geriatric Taiwanese females. The role of HDL-C and LDL-C in the definition of MetS should be re-evaluated.

ASSOCIATION BETWEEN HEMOGLOBIN AND COMPONENTS OF METABOLIC SYNDROME IN GERIATRIC TAIWANESE MALES

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Background: Recent studies showed that the components of metabolic syndrome (MetS) and erythropoiesis were correlated. However, these relationships were discussed mainly in middle age subjects but not in the geriatric group. In this study, the relationships between hemoglobin and MetS components were investigated in geriatric Taiwanese males.

Methods: A total of 1799 Taiwanese males over 65 years old were enrolled. In order to observe these relationships more precisely, we excluded subjects with diabetes, hypertension or hyperlipidemia. Subjects were on medications for these 3 diseases at the time of the study were also excluded. Hemoglobin was compared between subjects with and without MetS. After this, they were further divided into quartiles arbitrarily according to their hemoglobin (lowest, Hb 1; highest, Hb 4). The MetS components were compared between these 4 groups with ANOVA. Simple correlation and multivariate linear regression were also used to further explore the relationships between platelet count and MetS components.

Results: Hemoglobin was different between subjects with and without MetS ($p < 0.000$). The body mass index (BMI), diastolic blood pressure (DBP), total cholesterol, fasting plasma glucose (FPG), high-density lipoprotein-cholesterol (HDL-C), low-density lipoprotein-cholesterol (LDL-C), triglyceride (TG) and Log-triglycerides (Log-TG) were significantly different in the 4 groups. In simple correlation, HDL-C was negatively and other components plus systolic blood pressure (SBP) were positively and correlated with hemoglobin. However, FPG became non-significant after multivariate linear regression. BMI, DBP, LDL-C, TG and Log-TG were positively and SBP was negatively correlated with hemoglobin.

Conclusion: In our study, BMI, DBP, LDL-C, TG and Log-TG were positively correlated with hemoglobin among the MetS components in geriatric Taiwanese males.

OYSTER MUSHROOM EFFECT ON GLYCEMIA, LIPID PROFILE AND QUALITY OF LIFE IN TYPE-2 DIABETIC PATIENTS. DOUBLE BLIND PLACEBO CONTROLLED STUDY

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Objectives: The aim of the study was to evaluate efficacy of oyster mushroom on glycemic control, lipid profile and quality of life in type-2 diabetic patients.

Methodology: Total 150 type-2 newly onset diabetics were recruited. After 1 month stabilization period 120 patients were randomly selected. These patients were divided into three groups Group-1, 2,3 given type A, B, C biscuits respectively by dietician blindly. All three groups were also given conventional treatment i.e. diet, exercise for 3 months. Anthropometric parameters, FBS and BP were recorded weekly and HbA_{1c}, lipid profile, diabetic quality of life questionnaire were performed initially as well as after 3 months. After 3 months decoding was done and concluded that type A, B, C biscuits were Ajwain, Ajwain + Mushroom and Mushroom biscuits respectively.

Results: After 3 months period blood sugar reduced in ajwain+mushroom i.e. group 2 (225.41±3.35 to 113.83±4.03; $p < 0.005$) as also in mushroom i.e. group 3 (212.9±4.29 to 112±1.37; $p < 0.005$), Systolic blood pressure reduced in both groups group 2 (130.75±2.10 to 121.50±1.16; $p < 0.05$) and in group 3 (126.8±1.73 to 121.65±1.3; $p < 0.05$), Diastolic blood pressure reduced in [group 2 (85.00±1.31 to 79.70±0.70; $p < 0.05$) and in group 3 (82.00±0.96 to 79.95±0.79; $p < 0.05$)]. There was also significant effect on glycemic control (HbA_{1c}) in both groups [group 2 (8.47±0.17 to 7.27±0.14; $p < 0.02$) group 3 (8.00±0.13 to 6.99±0.12; $p < 0.05$)], there was significant reduction in lipid profile i.e. total cholesterol group 2 (190.69±4.39 to 166.83±2.47; $p < 0.001$) and group 3 (186.77±3.43 to 157.39±2.32; $p < 0.05$), HDL in group 2 (40.42±0.92 to 45.40±0.91; $p < 0.005$) and in group 3 (45.81±2.03 to 49.30±1.47; $p < 0.05$), LDL in group 2 (110.05±2.55 to 98.21±1.38; $p < 0.05$) and group 3 (103.04±3.41 to 96.99±3.30; $p < 0.05$), VLDL in group 2 (42.62±2.03 to 28.62±1.26; $p < 0.05$) and in group 3 (42.42±2.35 to 31.40±1.81; $p < 0.05$), serum triglyceride in group 2 (213.93±14.24 to 144.73±7.01; $p < 0.05$) and in group 3 (210.71±12.49 to 157.41±7.79; $p < 0.02$), Diabetes quality of life also improved significantly. No extra effect was observed due to supplementation of Ajwain.

Conclusion: Oyster mushroom consumption appears to be effective in controlling glyceemia, lipid profile and quality of life.

CENTRAL OBESITY AND METABOLIC SYNDROME AMONG YOUNG ADOLESCENTS IN TAIWAN

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Objects: The purpose of this study is to evaluate the prevalence of the metabolic syndrome (MetS) among young adolescents in Taiwan. We also address the importance of general or central obesity, using anthropometric index such as body mass index (BMI) or waist circumference (WC) on the risk of MetS among study subjects.

Methods: After multistage random sampling, we totally enrolled 1562 adolescents (764 boys and 798 girls) with age 11-15 years in 2003. We used modified NCEP-ATP III criteria the diagnosis for metabolic syndrome in the young adolescents including: blood pressure $\geq 90^{\text{th}}$, fasting glucose $\geq 90^{\text{th}}$, TG $\geq 90^{\text{th}}$, HDL-C $\leq 10^{\text{th}}$, and BMI or WC $\geq 90^{\text{th}}$ with age and sex specification respectively.

Results: The overall prevalence of MetS was 4.1 % for boys and was 3.8% for girls. After adjusting for age, cigarette smoking, alcohol drinking and pubertal status, BMI and WC were significantly associated with MetS for boys and girls. After further adjusting for BMI or WC, WC for boys (OR=1.14, 95%CI=1.05-1.24) and BMI for girls (OR=1.36, 95%CI=1.13-1.64) were the more significantly anthropometric index associated with MetS.

Conclusion: Central or general obesity may play a significant role in the developing of MetS, especially central obese for boys, in Taiwan. Further intervention study may be indicated for the obese, especially central obese, young adolescents to evaluate the effectiveness of weight control intervention program on the prevention of MetS in the future.

CARDIOVASCULAR RISK, ENDOTHELIAL DYSFUNCTION AND CAROTID ARTERY IMT IN YOUNG SUBJECTS WITH METABOLIC SYNDROME

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The metabolic syndrome is a constellation of increased abdominal obesity associated with dyslipidemia, impaired glucose tolerance and hypertension, being also a recognized risk factor for atherosclerosis.

Aim: To assess cardiovascular risk, brachial flow-mediated dilation (FMD), and carotid artery intimal-medial thickness (IMT) in a population-based cohort of young men screened for emerging clinical and lipid risk factors.

Methods: One hundred consecutive subjects were enrolled into the study (93M, 7F; mean age 41 years) and subsequently split into two groups who either had metabolic syndrome (n=40) or not (n=60), as per the definition proposed by International Diabetes Federation. Cardiovascular risk was prospectively evaluated through Framingham risk score and SCORE; brachial FMD and carotid IMT were also measured in all subjects.

Results: The respective groups differed in: age (39.5±5.40 year vs. 44.0±5.20 year; $p < 0.0001$), BMI (28.55±3.86 kg/m² vs. 33.16±3.87 kg/m²; $p < 0.0001$), plasma concentration of uric acid (337.50±77.30 μmol/L vs. 401.34±76.30 μmol/L; $p=0.0005$) for those without, as compared to the subjects with the metabolic syndrome. Mean IMT was higher (0.65±0.13 mm vs. 0.54±0.08 mm; $p < 0.0001$) and **brachial artery response was lower** (7.44 ± 3.31% vs. 8.07±3.68%; $p=NS$) in the subjects with the metabolic syndrome. Calculated cardiovascular risks were also higher in the subjects with the syndrome (10.11±5.69% vs. 3.74±2.83%; $p < 0.0001$ and 1.36±1.13 vs. 0.74±0.12) for Framingham risk score and SCORE, respectively. There were a positive correlation between Cardiovascular risks and IMT ($r=0.49$, $p < 0.0001$) and negative between Cardiovascular risks and FMD ($r=-0.3$, $p=0.1$) for both groups.

Conclusions: In young subjects exposed to multiple cardiovascular risk factors, particularly those with metabolic syndrome, IMT and FMD measurements clearly uphold the significance of early preventive and therapeutic measures aimed specifically at reducing cardiovascular risk. They also facilitate non-invasive diagnosis of atherosclerosis and may therefore be applied as an effective clinical screening method.

WAIST CIRCUMFERENCE IS THE BEST PREDICTOR OF ABNORMAL BLOOD PRESSURE RESPONSE TO EXERCISE IN MEN WITH THE METABOLIC SYNDROME

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Background: Insulin resistance is a key abnormality of the metabolic syndrome (MetS) and is associated with an atherogenic and inflammatory profile. IR has been suggested to be involved in the obesity associated hypertension. Exercise-induced hypertension (EIH), which is associated with higher risk of cardiovascular morbidity and mortality, has never been assessed in subjects with MetS. We evaluated EIH in men with MetS and explored potential relationships with metabolic and autonomic variables.

Methods: 181 normotensive men with MetS underwent a symptom-limited treadmill test. Blood pressure was measured after 5 min rest (anticipatory), every 3 min during exercise and during the recovery period. EIH was defined as maximum SBP ≥ 220 mmHg and/or maximum DBP ≥ 100 mmHg. Anthropometric parameters, lipid profile, glucose and insulin levels were assessed in the fasting state. Heart rate variability (HRV) was derived from a 24-hour Holter system in 98 of the 182 subjects. These subjects underwent a 75 g oral glucose test (OGTT).

Results: In the overall sample, 87 (48%) presented EIH. Maximal exercise BP were $231 \pm 18/99 \pm 13$ mmHg in EIH participants and $197 \pm 15/83 \pm 10$ mmHg in subjects with normal response to exercise (NRE) ($p < 0,01$). Resting BP were $127 \pm 10/83 \pm 6$ mmHg in EIH and $119 \pm 9/80 \pm 7$ mmHg ($p = 0,01$ for both) in NRE. Anticipatory SBP and DBP were higher in the group with EIH ($p < 0,001$). Subjects with EIH presented higher waist circumference (111 ± 8 vs. 105 ± 8 cm; $p < 0,01$). HRV analysis revealed that 24-hour SDNN was lower in the group of subjects with EIH ($p = 0,04$). 24 hr, daytime and night-time PNN50 and RMSSD were lower in the group of subjects with EIH ($p < 0,05$). During OGTT, plasma glucose levels were higher in subjects with EIH ($10,7 \pm 2$ vs $10,1 \pm 2$; $9,1 \pm 2,2$ vs $8,1 \pm 2$ and $8,1 \pm 2$ vs $7,2 \pm 2$ for EIH vs NRE groups at 60, 90 and 120 minutes, $p < 0,04$). Multivariate linear regression analyses revealed that the best predictors of EIH were resting SBP and WC. BMI was not associated with EIH after adjustment for WC and age.

Conclusions: Subjects with MetS and EIH presented evidence of impaired plasma glucose insulin homostasis in response to an OGTT. These EIH men could have impaired endothelial function and increasing sympathetic tonus compared to NRE men.

A DISTURBED CIRCADIAN PATTERN OF WATER-EXCRETION IS ASSOCIATED WITH BLUNTED INSULIN-SECRETION AND NOCTURNAL DIPPING OF BLOOD-PRESSURE IN SUBJECTS WITH METABOLIC-SYNDROME

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Introduction: Previous studies have shown that an impaired Na and/or water excretion during daytime (D) is associated with cardiovascular risk factors, such as higher body mass index, hypertension, and reduced dipping (NDip) of systolic blood pressure (SBP) during the night (N). The circadian pattern of water excretion may thus be predictive of adverse outcomes in selected populations such as patients with metabolic syndrome (MS).

Methods: We investigated 24-h urinary excretion and BP during D and N separately in 76 subjects (55M, 21F) with MS, not taking diuretics. Those without diabetes ($n = 46$) underwent an oral glucose tolerance test (OGTT).

Results: The D/N ratio of urine flow rate (UFlow) is usually > 1 in healthy subjects. Here, D/N of UFlow ranged from 0.36 to 4.33. SBP dipped less in patients with low D/N of UFlow and the correlation remained significant after adjustment for age and creatinine clearance ($\beta = -0.307$, $p < 0.01$). During the first 60min of OGTT, the rise in PIns ($\beta = 0.503$, $p < 0.001$) and the insulinogenic index (PIns/Pgluc, $\beta = 0.572$, $p < 0.001$) were positively correlated with D/N of UFlow even after adjustment for age, waist, 24-h urine volume and BP, suggesting unadequate insulin secretion in subjects with low D/N ratio of Uflow.

Conclusion: In patients with MS, a disturbed circadian pattern of water excretion is associated with a reduction of the nocturnal dipping of SBP and the insulinogenic index. These results suggest that the D/N ratio of UFlow may be a useful tool in predicting cardiovascular events and evolution to diabetes in MS patients.

EFFECT OF SERUM CIRCULATING ADIPOKINE LEVELS ON SUBJECTS WITH METABOLIC SYNDROME IN NORTH INDIAN ADULT WOMEN

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Aims: To investigate the effect of circulating Adipokine levels on subjects with metabolic syndrome (MetS) in north Indian adult women.

Methods: Total 541 subjects were divided into two groups, one group having metabolic syndrome (Metabolic risk factors: ≥ 3 out of 5) as study and another without metabolic syndrome (< 3 risk factors out of 5) as control group according to the criteria of National Cholesterol Education Programme Adult Treatment Panel III. Circulating Adipokines (IL6, TNF- α , Resistin, Adiponectin & Leptin) level was determined by sandwich ELISA method in North Indian adult women.

Results: Significant difference was found between metabolic syndrome and without metabolic syndrome in circulating adipokines level, metabolic risk factors and most of the biochemical parameters in North Indian adult women. Metabolic risk factors like Waist circumference (>88 cm), Blood Pressure (>130/85 mmHg), serum Triglyceride (>150 mg/dl), HDL-cholesterol (< 50 mg/dl) and fasting glucose (>110 mg/dl) were found significant higher in case of MetS on comparing with non MetS adult women. Circulating Adipokines levels were significantly higher in case of Interleukin-6, TNF- α , Resistin & Leptin (all values $p < 0.001$) in MetS women except lower adiponectin level ($p < 0.001$) as compared to women without MetS. Significant positive correlation were found with circulating IL-6, TNF- α , Resistin & Leptin levels but negative correlation was found for adiponectin level and metabolic risk factors in North Indian adult women.

Conclusion: High circulating serum adipokines level and the metabolic risk factors correlation suggests that they might take part in the development of metabolic syndrome in North Indian adult women.

Keywords: Circulating Adipokines level; Metabolic risk factors, Metabolic syndrome, NCEP-ATP III.

THE DEPENDENCE OF PARAMETERS OF METABOLIC SYNDROME FEATURES ON INSULIN RESISTANCE DURING LIFESTYLE INTERVENTION

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The aim of our investigation was to study the dependence of changes of parameters of metabolic syndrome (MS) features on the reduction of body mass during lifestyle intervention - balanced diet and moderate exercise. 33 patients with MS have been investigated (mean age - 49,1 \pm 8,7 years). MS was confirmed by WHO definition of 2002. All parameters of MS features have been determined baseline and after 6 months of study initiation. Balanced diet (restriction of easy-digestible carbohydrates and lipids and consumption of products with high cellulose content) and moderate exercise (60 min. walking three times per week) have been prescribed to all patients. After 6 months body mass index (BMI) was decreased from 37.5 \pm 5.2 to 34.3 \pm 4.9 kg/m² ($p=0.012$). Investigated subjects were divided on two groups: group 1 consisted of patients BMI of whom after 6 months decreased by magnitude less than 3.0 kg/m² (n=17); and group 2 - patients BMI index of whom after 6 months decreased by magnitude greater or equal 3.0 kg/m² (n=16). The degree of reduction of insulin resistance group 1 was less than group 2. The more positive changes of metabolic parameters of MS features during lifestyle intervention strongly depends on the degree of reduction of body mass. However, we suggest that investigations of this type have to be continued.

Parameter	- Decrease; + Increase		p
	Group 1 (n=17)	Group 2 (n=16)	
BMI, kg/m ²	-2,5 \pm 0,4	-3,9 \pm 1,0	< 0.001
WC, cm	-4,6 \pm 2,7	-7,9 \pm 4,7	0.018
HOMA-IR	-0,9 \pm 0,4	-1,2 \pm 0,4	0.010

[Table 1]

INCREASED GAMMA-GLUTAMYLTRANSFERASE AND DECREASED TOTAL BILIRUBIN ARE ASSOCIATED WITH METABOLIC SYNDROME IN POSTMENOPAUSAL WOMEN

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Background: Impaired hepatic functions are associated with metabolic syndrome. However, the linkage between hepatic dysfunction and metabolic syndrome in postmenopausal women has seldom been reported.

Methods: This study consisted of 1184 postmenopausal women who visited the Center for Health Promotion for a periodic medical health check-up. We excluded subjects with smoking habit or alcohol drinking, or chronic viral hepatitis. We also excluded subjects who had abnormal hepatic function, defined as a serum aspartate aminotransferase (AST) or alanine aminotransferase (ALT) >100 IU/L or a serum gamma glutamyltransferase (GGT) > 100 IU/L or a serum total bilirubin level > 2 mg/dl.

Results: Serum ALT and GGT levels increased with the increment of the number of MS components ($p=0.000$, respectively) but total bilirubin level decreased ($p=0.012$). After further adjustment for age, body mass index, presence of fatty liver, odds ratios (95% confidence interval) were 1.28 (0.81-2.04) in Log ALT, 1.60 (1.22-2.11) in Log GGT and 0.52 (0.31-0.87) in Log bilirubin in subject with metabolic syndrome.

Conclusion: We showed that increased GGT and decreased total bilirubin are associated with metabolic syndrome in postmenopausal women. Therefore, alterations in these markers may help to predict development of metabolic syndrome.

THE SEVERITY OF EXCESSIVE WEIGHT GAIN IS ASSOCIATED WITH THE DEVELOPMENT OF METABOLIC SYNDROME IN EARLY-MIDDLE-AGED EMPLOYEES: A 5-YEAR FOLLOW-UP STUDY

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Objective: A total of 1384 early-middle-age adults who did not meet the MetS criteria at the initial screenings were included for analysis. Baseline data, including MetS-components and lifestyle factors, were established in 2002. Body weight and MetS-components were measured in both 2002 and 2007. Participants were classified according to proximal quartiles of WG in percentages ($\Delta\%$ WG \leq 1%, 1% $<$ $\Delta\%$ WG \leq 5%, 5% $<$ $\Delta\%$ WG \leq 10% and 10% \leq $\Delta\%$ WG, defined as: control, mild-WG, moderate-WG and severe-WG groups, respectively) at the end of the follow-up. Multivariate models were used to assess the total population, as well as both genders individually, and were adjusted for age and baseline characteristics.

Methods: A retrospective five-year interval follow-up study. 1384 early-middle-ages who did not fulfill MetS criteria at baseline screening were enrolled. Baseline data including MetS-components and lifestyle factors were recorded in 2002. Body weight and MetS-components were measured in both

2002 and 2007. Participants were classified according to proximal quartiles of increased %WG ($\Delta\%WG \leq 1\%$, $1\% < \Delta\%WG \leq 5\%$, $5\% < \Delta\%WG \leq 10\%$, $10\% \leq \Delta\%WG$, defined as: control group, mild-WG, moderate-WG and severe-WG groups, respectively) at the end of follow-up. Multivariable models for total population and both gender were stratified by $\Delta\%WG$ categories, and were controlled for age and baseline measures

Results: In total, 175 (12.6%) participants were found to fulfill MetS criteria within five years. In comparison to the control group, adults with a moderate weight gain had a 3.0-fold increased risk of progression to MetS (95% confidence interval (CI), 1.8–5.1), while this risk was increased 5.4-fold (95% CI, 3.0–9.7) in subjects with a severe weight gain. Females with a moderate and severe weight gain, the risk of developing MetS was 3.6 (95% CI, 1.03–12.4) and 5.5 (95% CI, 1.4–21.4), respectively. For males with a moderate and severe weight gain, the risk of developing MetS was 3.0 (95% CI, 1.6–5.5) and 5.2 (95% CI, 2.6–10.2), respectively.

Conclusions: The severity of weight gain was found to be significantly associated with the development of MetS among early-middle-aged and apparently healthy adults with a five-year weight gain of greater than 5%.

OBESITY AND METABOLIC SYNDROME IN CHINESE CHILDREN AND ADOLESCENTS USING THREE DIFFERENT DEFINITIONS

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Objective: To compare the prevalences of metabolic syndrome (MS) according to the different definition, to analyze the relationship between obesity and MS, to study the principle components of MS.

Subjects and methods: Altogether 1176 Chinese children and adolescents aged 7-15 years (332 obese, 334 overweight, 500 normal-weight) were selected in five elementary and middle schools of Haidian district, Beijing, China. The prevalences of MS according to three proposed definitions were compared. Height, weight, waist circumference, systolic and diastolic blood pressures, fasting triglyceride, total cholesterol, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol and fasting glucose were determined.

Results: The prevalence of MS varied according to three different definitions, from 11.8% to 47.0%. Few subjects fulfilled all the definitions. There was a significant difference in the prevalence of MS among normal-weight, overweight and obese children ($p < 0.05$). The prevalence of abdominal obesity was the highest among the components of MS, no matter what definition was used. The areas under the ROC curve of adiposity indicators (BMI, SDS-BMI, waist circumference and waist to height ratio) were over 0.800, larger than other metabolic indicators.

Conclusion: The prevalence of MS in children depended strongly on the definition used. Obesity was associated with the MS and its components. Abdominal obesity was the principal component of MS. The adiposity indicators can be used to screen MS in children.

CHARACTERISTICS AND CLINICAL EXPRESSION OF THE HYPERTRIGLYCERIDEMIC-WAIST (WAIST-TG) PHENOTYPE ARE INFLUENCED BY THE MENOPAUSAL STATUS IN WOMEN

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Aims: Elevated fasting plasma triglycerides (TG) combined with abdominal obesity (waist-TG), represent an important cardiometabolic risk. Postmenopausal status also confers increased cardiovascular risk and is associated with several physiological and metabolic changes including in lipid-lipoprotein metabolism. Several subtypes of Hypertriglyceridemia (hyperTG) have been described (Fredrickson type I, IIb, III, IV and V). These subtypes differ by their prevalence, burden, genetic background and clinical expression. The distribution and characteristics of these phenotypes in pre- vs postmenopausal women is not well documented. This study investigated the expression of lipid phenotypes in women according to their menopausal status.

Methods: The lipid-lipoprotein phenotype of 4,440 french-canadian women (2,112 premenopausal and 2,328 postmenopausal) has been determined according to Fredrickson's criteria. ANOVA and chi-square analyses were used to compare TG values, anthropometric measures, the distribution of hyperTG subtypes and the prevalence of waist-TG according to menopausal status.

Results: Significant differences in the distribution of Frederickson's phenotypes between pre and postmenopausal women were observed ($p < 0.001$). In particular, type IV hyperTG was significantly more prevalent in the postmenopausal group (22.9% vs 13.8%). Comparisons of mean TG values within each Frederickson's subtypes showed that postmenopausal women with type IIa and IIb dyslipidemia tended to have higher TG values than premenopausal women with the same phenotype ($p < 0.01$), whereas mean TG values in type IV (the most prevalent hyperTG phenotype) was not affected by the menopausal status. The prevalence of the waist-TG phenotype in the different groups varied importantly, ranging from 25% in premenopausal women with type I to 80% in postmenopausal women with type V.

Conclusion: These results suggest that the characteristics and clinical expression of hyperTG and waist-TG is influenced by the menopausal status.

THE PREVALENCE OF METABOLIC SYNDROME AMONG JORDANIAN EMPLOYEES AND ITS ASSOCIATED FACTORS

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Background: Metabolic syndrome (MetS) is one of the major health problems around the world including Jordan and it has remarkable attention from epidemiologists in latest years.

Objectives: To estimate MetS prevalence among Jordanian employees and its associated factors including socio-demographic, lifestyle, and dietary.

Methods: A total of 491 university employees (344 men and 147 women aged 20 - 65 years) participated in this study. Blood samples were collected to measure fasting plasma glucose level and lipid profile (total cholesterol concentration, triglyceride concentration, high density lipoprotein cholesterol concentration, and low density lipoprotein cholesterol concentration), also blood pressure was measured. Information concerning socio-demographic and lifestyle characteristics were collected using self-administered questionnaire. Two 24-hour recalls were also collected.

Results: MetS prevalence was 36.3% (38.7% among men and 30.6% among women). Its prevalence was increased significantly with age in both men and women. About 82% of the study population had at least one metabolic abnormality and 45% employees at increased risk of developing metabolic syndrome. The lower high density lipoprotein cholesterol (HDL-C) was the most common abnormality in the study population (56.2%). Employees who were married, had large family size, had an income level \geq 500 JD, had management jobs, and were current smokers and physically inactive had high MetS prevalence ($p < 0.05$). Employees who consumed olive oil and milk or yogurt as snack had significantly lower incidence of MetS. Multiple logistic regression analysis results showed that the odds ratio of MetS was increased in older ages (OR: 3; 95% CI: 1.43-6.47; $p < 0.01$) and current smokers (OR: 2.6; 95% CI: 2.58- 4.22; $p < 0.01$). With elevation 1 unit in the body mass index (BMI), risk of MetS increased by 30% (95% CI: 22.9%-38.4%; $p < 0.01$) and an increase 1 mg/day in dietary iron intake, the risk of MetS increased 2.4% (95% CI: 0.07%- 4.3%; $p < 0.01$).

Conclusions: The prevalence of MetS is considered to be high among Jordanian Employees which highlights the urgent need to develop comprehensive national strategies for prevention and treatment of MetS in Jordan.

EVALUATION OF RELATIONSHIP BETWEEN GIRTH OF THE ABDOMEN AND HBA1_c

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Background and aim: Metabolic syndrome (MS) leads to type 2 diabetes mellitus (DM), atherosclerosis and cardio-vascular disease, cerebro-vascular disease. Diagnosis of metabolic syndrome in early period is very important in preventive and clinical medicine. Medical check program started 2008 in Japan for life-style related disease; Atherosclerosis, Hypertension, cardio-vascular diseases, cerebro-vascular diseases, Hyperlipidemia, type 2 DM, etc. The aim of our study is to elucidate the relationship between each items of medical check such as Body weight (BW), Lipids, Blood sugar (BS), and, etc and clarify the actual stature of MS and that in very early stage.

Materials and methods: The object we adopted were 40-74ys all the healthy people who choice Abiko-Toho Hospital as medical check voluntary (N=344, Male139, Female205). Items were Sex, Age, Heights, BW, BMI(Body Mass Index), Girth of the abdomen(GA),Blood pressure(BP) Triglyceride(TG), HDL-cholesterol(HDL-C), LDL- cholesterol(LDL-C), GOT, GPT, γ GTP, BS, Hemoglobin A1_c(HbA1_c) and questionnaires such as smoking, medications; type 2 DM, Hyperlipidemia, cerebro-vascular disease, cardio-vascular disease or any other diseases.

Results: According to the MS criteria in Japan (GA: Male 85cm Female 90cm and others of BMI 25, BS 100 or HbA1_c 5.2, Lipid (TG 150mg/dl or

HDL-C 40), BP (Systolic 130 or Diastolic 85) We classified the people in three groups; MS (N=30), pre-MS (N=39) and others (N=275). We evaluated the results of each items and statistical analysis were performed. Height and BW, BMI, BP, Lipids (TG, LDL-C, HDL-C), GOT, GPT, γ GTP, BS and HbA1_c has no relationships. Interestingly there was very good relationship between GA and HbA1_c in MS($r=0.37$) and pre-MS($r=0.44$) and others has no relationship.

Conclusion: Although we can't measure the visceral adipose ratio because of this medical check program doesn't have the item, relationship of GA and HbA1_c has interesting evidence of relationship in MS and pre-MS. There was no essential mechanism of why GA and HbA1_c have good relationship, but this interesting relationship will be good items for diagnosis and marker of the MS or pre-MS medical support, preventive medicine and therapy. GA is one of the valuable candidates to evaluate the MS and pre-MS and insulin resistance in early stage.

ASSOCIATION BETWEEN HEMOGLOBIN AND COMPONENTS OF METABOLIC SYNDROME IN GERIATRIC TAIWANESE FEMALES

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Background: Recent studies showed that the components of metabolic syndrome (MetS) and erythropoiesis were correlated. However, these relationships were discussed mainly in middle age subjects but not in the geriatric group. In this study, the relationships between hemoglobin and MetS components were investigated in geriatric Taiwanese females.

Methods: A total of 1453 Taiwanese females over 65 years old were enrolled. In order to observe these relationships more precisely, we excluded subjects with diabetes, hypertension or hyperlipidemia. Subjects were on medications for these 3 diseases at the time of the study were also excluded. Hemoglobin was compared between subjects with and without MetS. After this, they were further divided into quartiles arbitrarily according to their hemoglobin (lowest, Hb 1; highest, Hb 4). The MetS components were compared between these 4 groups with ANOVA. Simple correlation and multivariate linear regression were also used to further explore the relationships between platelet count and MetS components.

Results: Hemoglobin was different between subjects with and without MetS ($p < 0.000$). The body mass index (BMI), systolic blood pressure (SBP), diastolic blood pressure (DBP), total cholesterol, fasting plasma glucose (FPG), low-density lipoprotein-cholesterol (LDL-C), triglyceride (TG) and Log-triglycerides (Log-TG) were significantly different in the 4 groups. In simple correlation, all these components were also positively correlated with hemoglobin. However, SBP, FPG and TG became non-significant after multivariate linear regression. BMI, DBP, LDL-C and Log-TG were positively correlated with hemoglobin.

Conclusion: In our study, BMI, DBP, LDL-C and Log-TG were positively correlated with hemoglobin among the MetS components in geriatric Taiwanese females.

PRENATAL AND EARLY CHILDHOOD EXPOSURE TO MALNUTRITION DURING 1960 IN CHINA AND THE DEVELOPMENT OF METABOLIC SYNDROME IN LATER LIFE

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Objectives: To compare the prevalence of Metabolic Syndrome (MetS) and related risk factors among a cohort exposed to prenatal and early childhood malnutrition in 1960 with non-exposed cohorts (1956, 1964).

Methods: In 2008, demographic, lifestyle and medical history data, plasma lipids, fasting blood glucose (FBG), anthropometric measurements, and blood pressure were obtained from 793 adults (269 men, 524 women) born in Jinzhong, Shanxi, in 1956, 1960 and 1964. The revised ATP III was used: waist circumference (WC) 90 cm for men, 80 cm for women, and FBG 5.6 mmol/L (100 mg/dl).

Results: The mean MetS rate for all subjects is 46.4% (IDF, 43.1%). Rates in women increase with age (33.3%, 40.8%, 50.8%), while men born in 1960 have a higher rate (56.3%) than those born in 1964 or 1956 (51.5%, 53.3%). Men have higher mean FBG, triglycerides (TG) and LDL levels, and lower mean HDL levels. Men have increased FBG levels by age 48, while in women levels remain stable; the difference between genders (ANOVA $F=20.25$, $p=0.00$), and age cohorts are significant (ANOVA $F=3.17$, $p=0.04$). Men have higher rates of hypertension until age 52 when women's rates nearly equal men's. Women's WC increases significantly by age 48 (1960 cohort); men remain the same, and have a lower percentage above the standard than women at each age. Smoking and drinking are common in men (64.0% and 39.0%), but rare in women (2.0% and 1.1%). The odds ratio (OR) for MetS in smokers is 1.63 (CI 1.17, 2.27), with male OR=1.2 and female OR=2.1. People with MetS consume more alcohol, which is correlated with increased WC, mean FBG and self-reported diabetes. Non-drinkers have a mean FBG of 5.58 mmol/L, and the mean increases gradually with increased alcohol intake (ANOVA $F=4.818$, $p=0.002$).

Conclusions: Men with prenatal and early childhood exposure to malnutrition have a higher rate of MetS, an effect not seen in women. The mean MetS rate of 46% is high compared to other Chinese studies which used different criteria. Significant gender differences were observed, as in other studies, with the MetS rates rising sharply in women at age 52.

ESTIMATION OF HEMORHEOLOGICAL PROPERTIES AT THE PATIENTS WITH METABOLIC SYNDROME

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Aims: Research of features hemorheological properties at the patients with metabolic syndrome (MS).

Methods: 80 persons are included in research with MC had the central adiposity and 2 additional criteria, according to recommendations of the World National Organization of Public health services about diagnostics MC (2008). The control group was made by 20 healthy volunteers. To all patients standard clinical investigation and special analyses for hemorheological properties, such as macro- and microrheologia (aggregability erythrocytes, blood and plasma viscosities, citoarchetectonic and deformability erythrocytes) was carried. The analysis of results was made by a package of applied programs of the "Statistic vs. 6.0".

Results: In investigated group of patients with MC viscosity of blood is raised in comparison with control group, both at low, and at high speeds of shift. Hemotocrits did not differ from the control, but viscosity of plasma was authentically above at patients MC, than in control group ($2,04\pm 0,3$ mPa*s; $1,7\pm 0,2$ mPa*s accor., $p < 0,05$). Deformability erythrocytes is not changed ($1,09\pm 0,03$; $1,1\pm 0,03$, accor., $p=0,12$), the tendency to its change towards deterioration deformability erythrocytes however is observed. In investigated group authentic strengthening of processes of aggregation erythrocytes to what authentic reduction of time of assemblage linear erythrocytes units testifies is revealed (RT(0) in group MS $2,28\pm 0,3$; in control group $2,46\pm 0,2$ accord., $p < 0,05$). Also we reveal significant increase factor kogesii erythrocytes (FKE) at patients MC $0,008\pm 0,01$, in the control $0,0027\pm 0,001$, $p < 0,05$. The average size of the agregate is increased ($6,26\pm 0,38$; $5,44\pm 0,55$ accord., $p < 0,05$), thus, aggregation erythrocytes infringement at MC consists in assemblage acceleration erythrocytes agregates which have the usual size and durability. At patients MC as the aggregation indicator authentically increases ($1,95\pm 0,3$; $1,37\pm 0,2$ accord., $p < 0,05$) the part of not aggregated erythrocytes also decreases ($44,6\pm 9,3$; $70,4\pm 9,2$ accord., $p < 0,05$). Strong correlation FKE with limiting pressure of shift at patients MC is revealed ($r=0,3$; $p < 0,05$). We don't receive the authentic differences in the indexes citoarchetectonic erythrocytes.

Conclusions: Thus, at patients with a metabolic syndrome hemorheological infringements are more expressed in comparison with control group, and mention as parametres of viscosity of hole blood, and agregability properties of erythrocytes.

COMPARISON OF WAIST CIRCUMFERENCE AND METABOLIC SYNDROME FOR PREDICTION OF INSULIN RESISTANCE IN THE IRANIAN ELDERLY (KAHRIZAK ELDERLY STUDY)

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Introduction: Insulin resistance (IR) is associated a cluster of heart disease risk factors, called "metabolic syndrome". Waist circumference is an easy and useful tool to identify metabolic syndrome subjects. The aim of this study was to see whether waist circumference would predict insulin resistance as good as metabolic syndrome in the Iranian population.

Materials and methods: Out of 94 nondiabetic volunteers aged ≥ 65 year old, thirty three subjects with metabolic syndrome diagnosis were recruited among elderly residents of Kahrizak Charity Foundation between 2007-2008 in Tehran, Iran. MS diagnosis was based on NCEP ATP III and IDF definition. Insulin sensitivity was determined using HOMA index. Insulin resistance (IR) was defined as top quartile of HOMA in non-diabetic subjects.

Results: WC and HOMA index were highly positively correlated in both sexes. In males, after TG, the area under the curve (AUC) for WC was greater than other components of metabolic syndrome. AUC for WC was 0.83 (95% CI: 0.68-0.99) in males and 0.7 (95% CI: 0.56-0.85) in females. In females, AUC_{FBS} was more than AUC_{WC}. The optimal cut-off point derived from ROC curve was 94.5 cm for men and 90.5 cm for women. ICS² had a better predictive value than NCEP III in this population. The high sensitivity (0.80) and specificity (0.84) of WC in males indicates the proportion of IR which are correctly identified and recognizes all non-IR males as such.

Conclusion: Determining optimal WC to identify elderly IR subjects warrants further study in a larger sample of metabolic syndrome subjects.

ASSOCIATION OF METABOLIC RISK MARKERS IN NORTH INDIAN MALES WITH AND WITHOUT METABOLIC SYNDROME: A PILOT STUDY

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Aim: To examine the relationship of different metabolic risk markers in north Indian Males.

Materials and method: Total two hundred and sixty two subjects (age 32 ± 10 years) were enrolled in the study. Study group comprised of 142 subjects (with Metabolic Syndrome) and control group comprised of 120 subjects (without Metabolic Syndrome). They all were nondiabetic subjects taking no medication. Serum resistin concentration was measured by ELISA kit and Lipid Profile was also measured by commercially available kits.

Results: In a cross sectional case control analysis, Study group (with MS) had significant high values for most of the anthropometrical parameters (BMI 29.31 ± 3.94 Vs 22.69 ± 2.91, WC 105.55 ± 10.83 Vs 82.18 ± 9.66 and WHR 1.039 ± 0.068 Vs 0.91 ± 0.05) and biochemical parameters Blood Glucose level (107.44 ± 16.57 Vs 89.36 ± 14.86), Triglyceride level (172.89 ± 30.03 Vs 114.03 ± 22.54), Cholesterol level (181.73 ± 35.35 Vs 148.10 ± 25.08), TC/HDL ratio (4.84 ± 1.26 Vs 3.48 ± 0.86) and Resistin level (12.57 ± 4.88 Vs 7.09 ± 2.25) as compared to Control group (Without MS). Furthermore significant high values for insulin (2.5 ± 0.86 Vs 1.27 ± 0.5), Insulin resistance (9.23 ± 3.26 Vs 5.55 ± 2.48), LDL and HDL/ LDL level were found in case of study group (119.33 ± 45.33, 0.40 ± 0.30) as compared to control group (91.09 ± 33.11, 0.54 ± 0.22).

Conclusion: In the present study it was found that male subjects with metabolic syndrome had significant high values for Blood Glucose level, Triglyceride level, Cholesterol, TC/HDL ratio, insulin, Insulin resistance and Resistin.

Keywords: Metabolic Syndrome, Resistin, Insulin Resistance.

SHORT TERM FOLLOW-UP OF PATIENTS WITH METABOLIC SYNDROME AFTER SCREENING IN PRIMARY CARE

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Aims: We performed a screening among 1721 individuals with an increased self-measured waist circumference, not known with diabetes, hypertension or dyslipidemia. Of these, 473 were newly detected with the metabolic syndrome (MetS). However, screening and thereby establishing a diagnosis is only the beginning of a long process which needs follow-up with counselling and treatment. Both patient and physician play an important role. All screening participants were advised to contact their general practice for their results. Participants that were diagnosed with MetS and had not contacted their general practice within eight months, received a reminder.

Our aim was to investigate the normal course of events following screening for MetS in primary care. Did screening participants contact their general practice for the screening results? Did they adapt a healthier lifestyle after positive screening?

Methods: Data were collected from the electronic medical records and by asking patients between six and twelve months after screening. The following data were collected:

- General practice consulted after positive screening? With or without reminder?
- Lifestyle:
 - o Dietician consulted?
 - o Smoking ceased?
 - o Physical activity level increased?

Results: Of the 473 individuals with screen-detected MetS (mean age 50 years, 51% female), 406 visited their general practice because of the screening results at least once. 33% (mean age 47 years, 52% male) needed a reminder to do so. The individuals that did not contact their practice had a mean age of 45 years, 56% was male. Of 318 individuals, data about follow-up were collected within 12 months following screening. 24% was smoking during screening, 19% of them quit at the time of follow-up. 13% reported to have visited a dietician. At the time of screening, 59% of the individuals adhered to the Dutch norm for healthy physical activity. 43% of them reported to have increased physical activity at the time of follow-up. Of those individuals not adhering to the norm at screening, 58% reported to have increased their activity level.

Conclusions: Screening for MetS and subsequent diagnosis has a significant spontaneous follow-up in primary care. Participants adapted a healthier lifestyle after positive screening.

REDUCED ADIPOSITY AND IMPROVED METABOLIC PROFILE AFTER ANTISENSE REDUCTION OF GLYCEROL-3-PHOSPHATE ACYLTRANSFERASE 1 (GPAT1) EXPRESSION IN DIET-INDUCED OBESE MICE

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Glycerol-3-phosphate acyltransferase 1 (GPAT1) catalyzes the initial step in the *de novo* triglyceride synthesis. GPAT1-deficient mice show changed lipid metabolism and improved hepatic steatosis when fed a high-fat diet. To further investigate the role of GPAT1 in lipid metabolism and energy homeostasis, antisense approach was used to specifically reduce its expression in liver and fat in diet-induced obese mice. Male, 6-week old C57BL/6 mice were fed a 58%fat diet for 4 months and were subsequently treated with saline, a GPAT1-specific antisense oligonucleotide (ASO) or a control (CTL) ASO at a dose of 25 mg/kg s.c., twice a week for 7 weeks. GPAT1 ASO reduced GPAT1 mRNA levels by 77% in both liver and white fat whereas CTL ASO had no effect. As compared to the CTL ASO-treated mice, GPAT1 ASO treatment did not change food intake but decreased body weight by 10.6% (GPAT: 40.6 ± 1.6 vs CTL: 45.4 ± 1.1 g), total body fat content by 26.4% (GPAT: 12.9 ± 1.1 vs CTL: 17.5 ± 0.8 g), and epididymal and perirenal fat depot weight by ~37% without affecting lean body mass. GPAT1 ASO treatment also lowered plasma triglyceride levels by 49%, plasma total cholesterol by 22% and LDL cholesterol levels by 42%. In addition, GPAT1 ASO improved hepatic steatosis and reduced liver triglyceride content by 41.5% (GPAT: 46.5 ± 9.0 vs CTL: 79.8 ± 6.7 mg/g tissue). Furthermore, GPAT1 ASO increased plasma β-hydroxybutyrate levels by 2-fold, suggesting increased hepatic fatty acid oxidation. *In vivo* challenge of the mice with ³H₂O showed a decreased rate of *de novo* fatty acid synthesis in liver by 28% and in fat tissue by 70% and a decreased rate of hepatic sterol secretion by 29% in GPAT1 ASO-treated mice. The expression of key lipogenic genes, including ACC1, FAS, SCD1 and DGAT2, was down-regulated dramatically in these mice. These data demonstrate that GPAT1 plays an important role in lipid metabolism and that antisense inhibition of GPAT1 could be a potential therapeutic approach for the treatment of obesity and related metabolic disorders.

Nutrition

HIGH CALCIUM MILK PREVENTED OVERWEIGHT AND OBESITY AMONG POST MENOPAUSAL WOMEN

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Background: The Sixth National Nutrition Survey 2003 revealed that prevalence of overweight and obesity was highest (30.8%) among Filipino female adults aged 40-59 years old. Obesity poses a number of chronic diseases: CVD, hypertension, diabetes. Low calcium intake has been identified as a potential contributing factor to overweight and obesity.

Objective: To assess the effect of high calcium fortified low fat milk drink with added vitamin D versus a low calcium placebo drink on anthropometric measures of postmenopausal women.

Methods: Women at least 5 years post menopause were invited to participate in the study. Interested participants had to undergo 3 stages of screening process: initial interview, Dual Energy X-Ray Absorptiometry, and blood test for biochemical screening. A number of 60 women have been qualified to participate in the study. Women were randomly allocated into two groups: Group 1 received the high calcium milk while Group 2 received the placebo drink at 400 ml daily for sixteen weeks.

Results: No significant increases were observed in the anthropometric indices of the subjects on the high calcium fortified milk at the end of the study. A significant increase, however, was observed in the weight (p=.008), body mass index (p=.007), and waist (p=.018) and hip (p=.003) circumferences of the subjects on the placebo drink.

Conclusion: A change in dietary calcium intake may be a useful measure as part of an overall approach to prevent the occurrence of overweight and obesity among postmenopausal women.

Keywords: Calcium, dairy, postmenopausal, anti-obesity.

LEPTIN A BIOLOGICAL MARKER TO EVALUATE MALNUTRITION IN ELDERLY PEOPLE

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Aims: To determine the best biological marker of malnutrition in the elderly and its cut-off values to predict malnutrition.

Methods: This cross sectional study randomly enrolled 179 elderly patients. Nutritional status was defined by MNA. Mid arm circumference, calf circumference, weight, height and biological parameters including WBC, Serum insulin, Creatinine, total protein, albumin, CRP, Leptin, LDL-C, Total Cholesterol, TG and BUN were measured. Mean values in 3 groups of nutritional status were compared using two-way analyses of variance adjusted by sex. Correlations between the best biological marker in predicting malnutrition and other biological and clinical variables were assessed using Pearson correlation test. Finally, multiple linear regressions relating the best predictor of malnutrition between biological markers to specific subset of parameters were also performed and using ROC curves Cut-off values were determined.

Results: Well nourished group had significantly higher leptin (p=0.001), weight, BMI, Mid arm circumference and calf circumference (all, p< 0.001) in comparison with malnourished and at risk of malnutrition groups. Serum leptin was the best biological marker which had significant positive correlations with weight (p=0.003) and all the other anthropometric values (all p< 0.001) and no significant correlation with CRP. Sex (95%CI: 34.7-51.8; p< 0.001), weight (95%CI: 0.59-1.21, p< 0.001) and triglyceride (95%CI: 0.02-0.13; p< 0.001) were the best predictors of serum leptin. The optimal cutoff value of serum leptin level to detect malnutrition was 4.3 ng/ml in men and 25.7 mg/l in women.

Conclusions: Serum leptin may be a good predictor of nutritional status in elderly patients, even against a background of acute disease, which is frequent in this population.

EVALUATION OF MINI NUTRITIONAL ASSESSMENT FORM IN THE ELDERLY, TEHRAN, IRAN

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Aims: Whether MNA can screen and diagnose for malnutrition in the Iranian elderly.

Methods: The elderly population in this study was from kahrizak charity foundation (Tehran, Iran). Two hundred and twenty one consecutive elderly patients entered into this cross sectional study. Amputees and patients with liver or renal disorders, edema, or any end-stage diseases were excluded. MNA was applied to all the volunteers. Each patient underwent anthropometric and serum albumin measurement. Reliability, validity, sensitivity, specificity, positive and negative predictive values were estimated. To identify optimal threshold values for predicting malnutrition, Roc curve analysis was performed for MNA scores.

Results: According to MNA 3.2% were malnourished, 43.4% were at risk and 53.4% were well-nourished. These results according to IBW and serum albumin were 2.3%, 17% and 80% respectively. Cronbach's alpha coefficient (Reliability) was 0.61. The correlations between total score of the MNA, anthropometric values and serum albumin (Criterion related validity) were all significant. There were significant differences in total score of MNA between two BMI groups but not between two categories according to serum albumin and skin ulcers (construct validity). Sensitivity and specificity of MNA according to its established cut-off points were 82% and 63% respectively. Positive predictive value was 35% and negative predictive value was 93%. By using the best cut-off point (22 according to Youden index sensitivity, specificity, positive predictive value and negative predictive value were. 88%, 62%, 57% and 89% respectively.

Conclusions: MNA with its established cutoff points may not be a good fit for the Asian, including Iranian elderly.

DIETARY GLYCEMIC INDEX, DIETARY GLYCEMIC LOAD, BLOOD LIPIDS, AND CORONARY HEART DISEASE

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Objective: To examine the associations of dietary glycemic index (GI) and dietary glycemic load (GL) with blood lipid concentrations and coronary heart disease (CHD) in nondiabetic participants in the Health Worker Cohort Study (HWCS).

Materials and methods: A cross-sectional analysis was performed, using data from adults, free of previously diagnosed lipid disorders or type 2 diabetes, who participated in the HWCS baseline assessment. We collected information on participants' socio-demographic conditions, dietary patterns and physical activity via self-administered questionnaires. Dietary GI and dietary GL were measured using a validated food frequency questionnaire. Anthropometric and clinical measurements were assessed with standardized procedures, as were fasting total cholesterol, high density lipoprotein cholesterol (HDL-C), low density lipoprotein cholesterol (LDL-C), LDL-C/HDL-C ratio and triglycerides. CHD risk was estimated according to the sex-specific Framingham prediction algorithms. The associations of interest were evaluated by means of linear and logistic regression models.

Results: In the 5,954 individuals aged 20 to 70 who were evaluated, dietary GI and GL were significantly associated with HDL-C, LDL-C, LDL-C/HDL-C ratio, and triglycerides serum levels. Subjects with high dietary GI have a relative risk of 1.56 (CI 95%; 1.13 - 2.14), and those with high dietary GL have a relative risk of 2.64 (CI 95%; 1.15 - 6.58), of having an elevated CHD risk than those who had low dietary GI and GL.

Conclusions: Our results suggest that high dietary GI and dietary GL have an unfavorable effect on serum lipid levels, which are in turn associated with a higher CHD risk.

EFFECT OF MIXED NUT CONSUMPTION ON CARDIOVASCULAR RISK FACTORS AND GLYCEMIC CONTROL IN TYPE 2 DIABETES

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Background and aims: Nuts have been shown to reduce serum cholesterol and the risk of cardiovascular disease and diabetes but few studies have assessed the effect of nuts on glycemic control. We therefore assessed the effect of mixed nuts at two doses on serum lipids and glycemic control in subjects with type 2 diabetes.

Materials and methods: 117 type 2 subjects with diabetes treated with oral hypoglycemic medications were randomized to one of three treatments for three months: 75 g mixed nuts; 38 g mixed nuts and half portion of muffins; and full portion of muffins. Supplements provided 475 kcal per 2000 kcal diet. The primary outcome was change in HbA1c with serum lipids, CRP, body weight and blood pressure as secondary measures.

Results: Using an intention-to-treat analysis of the data (n=117), only after full dose nuts was a significant reduction from baseline seen in HbA1c of -0.2 ± 0.05 HbA1c % units ($P < 0.001$) whereas for half nuts plus muffin and muffin alone the respective results were -0.05 ± 0.07 , ($P > 0.05$) and -0.05 ± 0.06 HbA1c ($P > 0.05$). Significant differences were also seen between nuts and muffins with greater falls on nuts for LDL-C (-0.19 ± 0.12 mmol/L, $P = 0.03$). Nut intake directly related to change in LDL-C ($r = -.24$, $n = 98$, $P < 0.05$).

Conclusion: Mixed nuts may be an effective way to improve cardiovascular risk factors and glycemic control in type 2 diabetes.

RELATIONSHIPS BETWEEN FATTY ACID DESATURASES, DIETARY FAT AND ABDOMINAL TISSUE DISTRIBUTION IN HUMANS

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Objectives: Endogenously synthesized and desaturated fatty acids (FA), as well as FA derived from diet have been closely linked to insulin resistance and metabolic disorders. Whether FA desaturase activities and dietary FA are associated with different adipose tissue depots is unknown. We aimed to assess those relationships.

Methods: In a population-based sample of the Prospective Study of the Vasculature in Uppsala Seniors (PIVUS), we investigated cross-sectional relationships between FA composition in plasma cholesterol esters and subcutaneous (SAT) and visceral adipose tissue (VAT). In 260 healthy men and women aged 70 years we determined SAT and VAT by MRI and total fat by DXA. We calculated desaturase activity indices using FA product-to-precursor ratios; stearoyl CoA desaturase (SCD-1); 16:1n-7/16:0; delta-6 desaturase; 18:3n-6/18:2n-6; delta-5 desaturase; 20:4n-6/20:3n-6. FA composition was assessed by gas chromatography. Pearson's correlations were performed univariate, and multivariate linear regression for dietary FA biomarkers adjusting for physical activity and total energy intake.

Results: Estimated SCD-1 and delta-6 desaturase activities were related to SAT ($r=0.23$ and $r=0.29$, respectively) and total fat ($r=0.19$ and $r=0.18$, respectively), but not to VAT. Conversely, delta-5 desaturase activity index was inversely associated with all fat depots, including total fat (all $p < 0.05$). Saturated fatty acids (16:0 and 18:0) were positively correlated to VAT ($r=0.19$ for both, $p < 0.01$), but not to SAT or total fat. Associations remained in multivariate model (all $p < 0.01$). 18:2n-6 (linoleic acid) was inversely related to SAT, VAT and total fat ($r=-0.17$, $p < 0.01$, $r=-0.25$, $p < 0.001$, and -0.27 , $p < 0.001$, respectively), associations remained in multivariate analyses (all $p < 0.01$). Long chain n-3 FA (20:5n-3 and 22:6n-3) were not associated with SAT, but weakly and positively with VAT and total fat in multivariate model (all $p < 0.05$).

Conclusions: Desaturase activities may be different depending on enzyme and fat depot. High proportions of polyunsaturated FA (linoleic acid, omega-6) were independently related to lower fat content in all depots, whereas saturated FA were positively related to visceral fat. Whether a diet high in polyunsaturated fat and low in saturated fat decreases abdominal fat will be further investigated.

IMPLEMENTING GLYCEMIC INDEX IN THE MANAGEMENT OF WEIGHT, BMI AND TYPE-II DIABETES MELLITUS

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Background: Nowadays diet is flooded with calorie dense foods which also contain high amounts of refined carbohydrates and saturated fat. The problem with these foods is that they are also contributing to the growing obesity epidemic, increased incidence of Diabetes Mellitus and related complications all over the globe.

Objectives: To assess the clinical utility or usefulness of the GI in the nutritional management of weight, BMI and Type-II Diabetes Mellitus.

Methods: A study was carried out on 200 subjects (all literate - graduation level or more) between the age group of 45 - 60 years with established Type - II Diabetes Mellitus. All these subjects were imparted proper education / awareness regarding the concept and benefits of consuming low glycemic index diets. International tables giving glycemic index of various cereals, fruits, beverages and mixed meals were also provided to the subjects. Then these subjects are divided into two groups: Group -1 and Group - 2. Group-1 is asked to consume low glycemic index diets (according to the international tables) for two months while the Group- 2 served as the control group by consuming diets according to their previous daily routine. The subjects were also instructed to maintain a diary of their daily consumption of various meals/diets. All the 200 subjects were subjected to estimation of Glycosylated Hemoglobin (HbA1c%) levels and their height and weight taken at the start of the experiment. The same tests were repeated in both the groups at the end of 2 month period. In the next two months the reverse scheme is followed by the two groups (Group - 1 served as the control group while Group - 2 consumed the low GI diets) and the same tests were conducted. It is a randomized, controlled, open trial study design. The subjects included in the study group were neither compelled to participate in the study nor were they subjected to any kind of risk.

Results: Low GI diets proved to be a boon in reducing weight and reducing the risk of complications in Type-II Diabetes Mellitus.

LONG TERM EXCESSIVE ZN SUPPLEMENTATION INDUCES OXIDATIVE STRESS IN WISTAR RATS FED SUCROSE AND FAT RICH SEMISYNTHETIC DIET

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During last many years Zinc (Zn) as a micronutrient is being used indiscriminately in husbandry and agriculture practices and also in baby foods and multivitamin supplements with a view that Zn is non toxic mineral and promotes growth and body weight in the consumers. The long term effect of excessive Zn in diet to the oxidative stress of the body has not been worked out so far. In this study, three groups of rats were fed on semi-synthetic diet containing 20 mg (control, group-I), 40mg (group-II) and 80mg Zn /kg (group-III) diet respectively for a period of 180 days. The data of this study revealed that the gain in body weight increased in rats in Zn-concentration

dependent manner. The urine examined on weekly basis showed glucosuria in group-II on week 10 and in group-III on week 8 and thereafter. Their arterial blood pressure was significantly higher in group-II and III than their control counter parts on monthly basis ($p < 0.001$). The blood profile after 180 days of dietary treatment, displayed a significant rise in serum glucose, total lipids, cholesterol, triglycerides, LDL-cholesterol, VLDL- whereas HDL-cholesterol showed a reduction in their levels in group-II and III than their control counterparts ($p < 0.001$). The lipid peroxidation products were higher and the enzyme activities of superoxide dismutase, catalase, glutathione-S-transferase, glutathione reductase, glutathione (reduced) and glucose-6-phosphate dehydrogenase were significantly lowered in liver and kidney of group-II and group-III ($p < 0.001$). Their mineral status revealed a higher Zn concentration and lower Cu, Mg and Mn both in liver and kidney ($p < 0.001$). This data suggest that Zn in excess in diet when fed for longer periods of time induces oxidative stress.

RANDOMISED CONTROLLED TRIAL OF A WEIGHT LOSS DIET RICH IN WHOLEGRAINS AND PULSES ON WEIGHT LOSS AND WAIST CIRCUMFERENCE

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Wholegrain intake is inversely related to weight gain over time but there is little information on the role of pulses in weight control. Our objective was to compare the effect of diets differing in wholegrain and pulse content on weight loss in overweight adults. This was a randomised-controlled parallel study of 18-months with 108 volunteers (BMI $\geq 28\text{kg/m}^2$). The intervention group was encouraged to consume wholegrain foods and pulses; the control group followed a diet based on recommendations published by the National Heart Foundation of New Zealand. Intensive support and key foods were provided during the first 6-months. Foods given to the intervention group were whole rolled oats and rye, a variety of tinned legumes, and wholegrain wheat or rye breads. The control group were provided with ready-to-eat breakfast cereals, a variety of tinned vegetables and fruit, and bread with no wholegrain content. Mean fiber intakes were higher, intakes of potassium, iron, manganese, niacin, vitamins B6, C and E were better maintained, and dietary Glycaemic Index was lower in the intervention compared with the control group. The data were analysed according to modified intention to treat after imputing missing values using chained equations. Mean (SD) weight loss at 6-months was 6.0 (0.7) and 6.3 (0.6) kg in the control and intervention groups, respectively, and was not different between groups ($P > 0.05$). At 6- and 18-months, blood pressure, fasting triglycerides and glycemic load were lower in both groups compared with baseline but were not different between groups. There was a decrease in waist circumference at 18 months in the intervention compared with the control group (-2.8 cm, 95% CI: -0.4, -5.1). These data are in agreement with findings from observational studies and support national guidelines for healthy eating that recommend the inclusion of wholegrains and pulses into the diet.

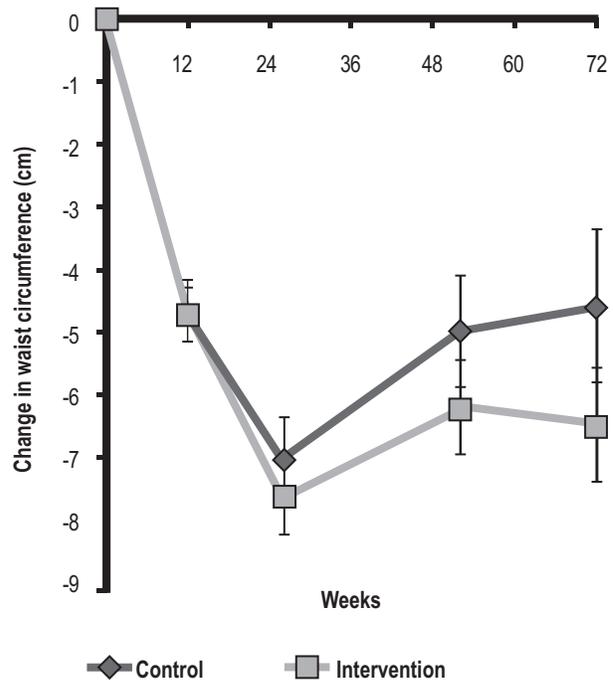


Figure: Change in waist circumference over time in a group consuming a diet rich in wholegrains and pulses compared with a control group (n = 56, 54, 49, 34, 30 and 56, 51, 49, 45, 41 at baseline, 12, 26, 52 and 72 weeks in the control and intervention groups, respectively).

[Figure]

Obesity

OVERWEIGHT AND OBESITY IN THE EASTERN PROVINCE OF SAUDI ARABIA

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Objective: To describe anthropometric characteristics of participants and the influence of sociodemographic and cardiovascular risk factors involved in the prevalence of obesity, in the eastern province of Saudi Arabia.

Material and methods: In the year 2004, all Saudi residents in the Eastern province aged 30 years and above, were invited to participate in a community screening campaign for early detection of diabetes and hypertension. Demographic data, medical history, life habits, weight, height, blood pressure, and glucose concentration were recorded using a structured questionnaire. Obesity and overweight were defined by body mass index 30 and 25-29.9 kg/m², respectively. Logistic regression was used to predict the association of the significant factors with the prevalence of obesity.

Results: Out of 195,874 participants, the overall prevalence of obesity was 43.8%, while 35.1% were overweight. The prevalence of underweight was 1.3%. The peak prevalence of obesity was observed in the age group 50-59 years. Obesity was higher among women than men, higher in housewives, and among the less educated than others ($p < 0.0001$). Linear regression analysis showed a strong proportional association of BMI with diabetes, hypertension, triglycerides and cholesterol, and an inverse proportional association with physical activity and smoking.

Conclusion: Obesity and overweight constitute an important health problem affecting a high proportion of Saudi population. Addressing associated factors and enhancing public health education is an important aim to focus on for weight control.

Keywords: Overweight, obesity, body mass index, screening, Saudi Arabia.

PREVALENCE OF OVERWEIGHT AND OBESITY AND THEIR CORRELATES- A CROSS SECTIONAL STUDY AMONG MEDICAL STUDENTS OF INDIA

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The present Cross-sectional study was carried out from January, 2007 to December, 2008 with the following objectives:

1. To find out the prevalence of overweight and obesity in medical students.
2. To determine the correlates of overweight and obesity.

Participants were medical students posted in the Department of Community Medicine during 3rd to 5th semesters under Rural Health Posting. Total number of participants was 240 comprising of 150 male and 90 female students. A pretested questionnaire was given to them and complete personal details, dietary habits were noted down followed by examination. Body Mass Index (BMI) was used to categorize the students into underweight, normal, overweight and obese groups. A BMI of $< 18.5 \text{ Kg/m}^2$ was taken as cut off point for under weight. Overweight and Obese were taken at the level of 23 Kg/m^2 and 25 Kg/m^2 and above respectively.

Among 150 male students, 30 (20.0%) were overweight while 9 (6.0%) were found to be obese and 6 (4.0%) were underweight. Among 90 girls, 21 (23.3%) were overweight, 10 (11.1%) obese and (7.7%) were found to be underweight. High calorie intake was noticed in 45 (30.0%) male students and lack of physical activity was observed in 25 (16.7%) male students. Among female students, high calorie intake and lack of physical activity was found in 31 (34.4%) and 20 (22.2%) students respectively.

There is urgent need for prevention of obesity and its risk factors among college students. These findings have enormous significance for developing societies emerging from poverty and continuing to bear the double burden of both form of malnutrition in their populations.

CAN SELF-REPORTED BODY WEIGHT AND HEIGHT BE USED FOR OVERWEIGHT/OBESITY SCREENING IN HONG KONG CHINESE CHILDREN?

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Objectives: This study validated self-reported body weight (SRBW) and body height (SRBH) as well as BW and BH derived BMI (SRDBMI) in children and examined the accuracy of using SRDBMI to classify overweight/obese children.

Methods: A cross-sectional random sample consisted 1614 school children (671 boys and 943 girls) aged 6 -18 years recruiting from 5 primary and 6 secondary schools. A self-administered questionnaire was used to collect demographic data, SRBW and SRBH values before they were measured their BW and BH at schools.

Results: The reliability analyses demonstrated excellent agreement between measured and self-reported values [intraclass correlation coefficients (ICC) ranged from $r = 0.97$ (95% CI 0.96, 0.97) to $r = 0.99$ (95% CI 0.98, 0.99)]. Over half of the children could report their BW and BH absolute values less than 2 kg and 2 cm differences from the measured values. For overweight/ obese children, their measured BMI were 25.6% for boys and 17% for girls and SRDBMI were 24.9% for boys and 15.7% for girls. The overweight/obese classifications by SRDBMI were accurate with high sensitivity [0.84 (95%CI 0.78, 0.89) for boys; 0.83 (95%CI 0.77, 0.88) for girls], specificity [0.96 (95%CI 0.93, 0.97) for boys; 0.98 (95%CI 0.97, 0.99) for girls], PPV 0.87 (95%CI 0.81, 0.91) for boys; 0.90 (95%CI 0.84, 0.94) for girls], and NPV [0.95 (95%CI 0.92, 0.96) for boys; 0.97 (95%CI 0.95, 0.98) for girls].

Conclusion: Self-reported body weight and height derived BMI reliably estimated rates of overweight and obesity in Hong Kong Chinese children.

ASSOCIATION BETWEEN SERUM NITRIC OXIDE METABOLITES AND OBESITY IN A GENERAL POPULATION: TEHRAN LIPID AND GLUCOSE STUDY

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Aim: Serum nitric oxide metabolites (nitrate+nitrite= NO_x) are used to evaluate nitric oxide production. This study aims at determining the association between serum NO_x levels and obesity indices in a general population.

Material and methods: In a cross-sectional study, NO_x was measured in 3505 (1296 men and 1852 women), aged 20 to 94 years, using the Griess method. After excluding subjects taking medications for hypertension and dyslipidemia, data for 3148 subjects were analyzed. Pearson correlation coefficients were calculated for finding the relation between obesity indices and serum NO_x levels. Using analysis of covariance (ANCOVA), serum NO_x concentrations were compared among different category of body

mass index (BMI) and quartiles of waist circumference (WC), waist-to-hip ratio (WHR), and waist-to-height (WHtR) after adjustment for age, total cholesterol, triglycerides, smoking, history of cardiovascular disease and cancer, diabetes, family history of cardiovascular disease and diabetes, and menopausal status (only for women).

Results: In univariate analyses, NO_x showed positive correlation with WC, WHR, and WHtR in men and with WC, WHR, WHtR, and BMI in women. In multivariate analyses, none of these obesity indices were associated with serum NO_x levels in males however, serum NO_x showed a direct association with BMI in females. Serum NO_x concentration in underweight (BMI < 18.5 kg/m²), normal weight (BMI: 18.5 to 25 kg/m²), overweight (BMI: 25 to 30 kg/m²), and obese (BMI ≥ 30 kg/m²) females were 22.8, 26.0, 28.1, and 29.3 μmol/L respectively (p for trend = 0.001). Association between serum NO_x concentration and WHR (p= 0.053) or WHtR (p=0.08) were only marginally significant in females.

Conclusions: After adjustment with most confounders, serum NO_x concentration was associated with BMI in women but not in men, indicating gender effects. It seems that BMI would be a better obesity index for prediction of nitric oxide production in females.

PREVALENCE OF OBESITY AND ITS ASSOCIATION WITH SOCIOECONOMIC FACTORS IN ELDERLY IRANIANS FROM RAZAVI-KHORASAN PROVINCE

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Introduction: There is little data regarding the prevalence of obesity and its socioeconomic determinants of among elderly individuals, particularly in Iran. We wished to determine the prevalence of overweight and obesity in free living elderly people and its relationship to nutritional and socioeconomic factors in the Razavi-Khorasan province of Iran.

Methods: Free-living elderly (917 male/1045 female) aged ≥60 years, were recruited using cluster sampling. Overweight and obesity were evaluated using body mass index (BMI) and subjects were categorized to thin (body mass index < 18.5 kg/m²), normal (18.5-24.9 kg/m²), overweight (25-29.9 kg/m²) and obese groups (≥30 kg/m²). The relationship between obesity and socioeconomic and dietary factors were examined with the place of living (rural vs. urban), education, gender, type of living (alone or with family), occupation, source of income, supporting system (e.g. charities), and dietary supplementation intake.

Results: The mean body mass index (BMI) values were 23.5 kg/m² and 24.8 kg/m² in men and women respectively. The distribution of BMI values indicated that 13%, 46.5%, 28.8%, and 11.7% of total population were thin, normal, overweight and obese respectively. The prevalence of central obesity was higher among Iranian women than men (63.1 v 18.6% respectively).

Conclusion: This study showed 40.6% of elderly subjects were overweight or obese. Results reinforce the need to plan strategies for primary prevention of this fast growing public health problem.

THE EFFECT OF A TRAINING PROGRAM ON BODY COMPOSITION, GH, INSULIN AND IGF-1 IN OVERWEIGHT FEMALE COLLEGE STUDENTS

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Aim: The aim of this study was to determine the effect of a training program on body composition, GH, IGF-1 and insulin in overweight and obese female college students.

Material and methods: 17 volunteer overweight female college students who had little physical activity were divided into 2 groups. The first group was the experimental group (E) (N=9, Age range =18.9±1.3, Height= 159± 0.04cm, weight = 73.46± 7.75), the members of which participated in a 6-week-long training program (3 sessions per week) consisting of an incremental running protocol in each week with %60 to %70 maximum heart rate, resistance training, and aerobic exercise. The second group was a non-exercise control group (C) (N=8, Age=19.3±1.7, Height= 157± 0.06cm, Weight = 64.84± 6.84). The subjects in both groups were given a pre-test and a post-test. The variables measured included anthropometric, VO₂max and plasma growth hormone (GH), insulin and total insulin like growth factor-1 (tIGF-1). One-way ANOVA and LSD post hoc tests were used to assess differences between the groups and dependent-samples t-test was used to determine the differences, if any, between the groups in the pre-test and post- test stages.

Findings: VO₂max increased significantly in E (P=0.004) but decreased in C. Body weight decreased in E (P=0.23) without significant changes in fat mass, whereas weight and fat mass increased in C. The soft lean mass decreased in both groups but this decrease was not significant. IGF-1 significantly increased in both groups (P=0.004), (P=0.003). GH did not increase significantly in E (P=0.38). On the other hand, It decreased in C (P=0.26), which was not statistically significant. Insulin, however, remained approximately unchanged.

Conclusion: The results showed that the E group's training program caused a statistically significant improvement in VO₂max. Although the time length of the experiment was not very long, and there occurred an increase in the energy intake in the middle of the period, the exercise program led to a decrease of the subjects' bodyweight, which was not statistically significant. This is contrary to what is typically found in other research studies based on which a weight loss training program is unsuccessful when the duration of such programs is short. The significant increase of IGF-1 in the E and C groups may have resulted from training effects and/or from progressive increase in calorie intake. Although the increase in GH was not significant, it may have been caused by training effects. In contrast, the GH decreased significantly in C group. Given the loss of soft lean mass in the E group and the inadequacy of the necessary information to plan efficient training programs for weight loss, further research with longer periods of experimentation and more intense resistance training for both genders is suggested.

Keywords: Obesity - Body composition - Aerobic exercise - Weight loss.

ZINC-A2-GLYCOPROTEIN IS INVOLVED IN REGULATION OF BODY WEIGHT THROUGH INHIBITION OF LIPOGENIC ENZYMES IN ADIPOSE TISSUE

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Context: Zinc-A2-glycoprotein (ZAG) was found to influence lipolysis in adipose tissue and has recently been proposed as a candidate factor in the regulation of body weight.

Objective: To elucidate the association of serum ZAG level with body weight and percentage of body fat in normal, obese subjects and high-fat-diet (HFD)-induced obese mice.

Design: The relationship between serum ZAG and obesity-related parameters was studied in 44 subjects and 36 mice fed standard food and HFD. Furthermore, the effects of ZAG over-expression on adipose tissue of mice was also evaluated by using a liposome transfection method.

Results: serum ZAG level was significantly lower in obese patients and obese mice in comparison to that in people and mice with normal weight. The further statistical analysis demonstrated that ZAG level was negatively correlated with body weight ($r = -0.62$, $P < 0.001$), BMI ($r = -0.64$, $P < 0.001$), waist circumference ($r = -0.68$, $P < 0.001$), hip circumference ($r = -0.60$, $P < 0.001$), percentage of body fat ($r = -0.52$, $P = 0.03$) and fat mass ($r = -0.59$, $P = 0.01$) in human subjects after adjustment for age and sex. Furthermore, ZAG over-expression in mice reduced body weight and the percentage of epididymal fat. The decreased FAS, ACC1 and DGAT mRNA and the increased HSL mRNA were also observed in epididymal adipose tissue in ZAG over-expression mice.

Conclusion: ZAG is closely linked to obesity. Serum ZAG level is inversely associated with body weight and percentage of body fat. The action of ZAG is associated with down-regulated lipogenic enzymes and up-regulated lipolytic enzyme expressions in adipose tissue of mice.

ASSOCIATION OF IL6 -G174C PROMOTER GENE POLYMORPHISM AND CIRCULATING RESISTIN LEVEL WITH METABOLIC RISK FACTORS IN NORTH INDIAN ADULT WOMEN

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Aims: The study was conducted to investigate the association of the IL6 -G174C (rs1800795) promoter gene polymorphism and level of new adipocyte derived hormone resistin and their potential roles in metabolic syndrome in north Indian adult women.

Methods: Total 370 subjects were divided into two groups having WHR > 0.85 as obese (central obesity) and WHR < 0.85 as non-obese (healthy control). Circulating resistin level was determined by sandwich ELISA method and fasting blood glucose, insulin and lipid profile by commercially available kits. Insulin resistance was calculated by the homeostasis model assessment

(HOMA) index. The genotype and allele frequency of IL6 -G174C gene polymorphism was determined by PCR-RFLP method in 192 obese and 178 non-obese adult women from Northern India.

Results: Significant difference was found between obese and non-obese women in most of the biochemical parameters and genotype frequencies. The circulating level of serum resistin was highly significant in obese women (17.7 ± 8.03 vs 7.12 ± 3.15 , $P = 0.0001$) compared to non-obese. The genotype CC ($P = 0.0006$; OR = 0.45, 95% CI = 0.29-0.71) and allele frequency ($P < 0.0001$; OR = 2.26, 95% CI = 1.68-3.03) distribution of IL6 -G174C gene polymorphism in obese women was statistically significant in comparison to non-obese women. Significant association was found with CC+GC genotype of IL6 -G174C promoter gene polymorphism in case of waist circumference > 88 cm, serum triglyceride > 150 mg/dl, HOMA index > 3.6 and serum resistin level ($p = 0.031$; OR = 0.498 95% CI = 0.262-0.953) but no association were found with plasma glucose > 110 mg/dl and TC/ HDL > 3.8 compared to GG genotype in obese women.

Conclusion: High serum resistin and the disorder of metabolism of glucose and lipid is associated with metabolic risk factors. The association of serum resistin with CC+GC genotype of IL6 -G174C promoter gene polymorphism suggests that they might be take part in the development of metabolic syndrome in north Indian adult women.

Keywords: Interleukin-6 gene polymorphism; Resistin; Insulin resistance, Metabolic risk factors, Metabolic Syndrome.

THE IMPORTANCE OF WAIST CIRCUMFERENCE IN THE ASSESSMENT OF THE RISKS OF OBESITY AND OBESITY-RELATED CO MORBIDITIES

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Background: Obesity is associated with chronic conditions such as Type 2 diabetes, hypertension, hypercholesterolemia, that are major risk factors for cardiovascular disease, reduce quality of life and can lead to premature death. With the recognition that central obesity is closely associated with chronic disease, the National Institute for Health and Clinical Excellence (NICE) guidance classifies health risk by combining body mass index (BMI) and waist circumference (WC). A high WC (94-102 cm in men, 80-88 cm in women) and very high WC (> 102 cm in men, > 88 cm in women) is suggested by NICE as being associated with increased health risks for people with a BMI ≥ 30 kg/m²; health risks are very high for people with a BMI ≥ 35 kg/m², even when the WC measurement is low. The aim of this analysis was to examine the prevalence of combined health risks of raised WC and overweight/obesity according to the NICE definition and look into the link between raised WC with possible risk factors.

Methods: Nationally representative cross-sectional population survey: the Health Survey for England (HSE) included 4274 men and 5043 women aged ≥ 16 living in private households in England 2006.

Outcome measures: Socio-demographic information, risk factors, height and weight and WC measurements.

Results: Using the NICE guideline definitions of health risk, very high risk of the health effects of overweight and obesity increased with age; highest in those aged 65-74 (30% of men, 34% in women). Among men aged 25-34, 16% had a high or very high WC and BMI ≥ 30 kg/m². Regression analyses

showed that raised WC was positively associated with age (odds ratio(OR): 6.7 in men and 6.3 in women aged 65-74), with being an ex-cigarette smoker (OR: 1.6 for men and 1.2 for women), and with low levels of physical activity (OR:2.1 in men and 1.9 in women). Women in the lowest income quintile had twice the odds of a raised WC compared with women in the highest income quintile.

Conclusion: The data highlights the need for healthcare professionals to consider both BMI and WC into routine practice when assessing risks of obesity and obesity-related co morbidities.

THE IMPACT OF OBESITY ON OUTCOMES AMONG HEAD INJURY PATIENTS

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Introduction: Obesity is a risk factor for outcomes of the critically ill patients. This study was conducted to determine the impact of obesity on outcome of head injury patients.

Methods: A prospective study was done on 115 head injury patients admitted to the intensive care unit in a six-month period from Sep 2005 to March 2006. Obese patients (body mass index [BMI] ≥ 30 kg/m²) were compared with non-obese patients (BMI < 30 kg/m²).

Data collected included demographic information, Acute Physiology and Chronic Health Evaluation scores APACHE II, Injury Severity Score (ISS), hospital mortality, ICU and hospital length of stay (ILOS, HLOS), and the number of days the patient required mechanical ventilation.

Results: There was no difference in APACHE II scores, ILOS, and HLOS, but significant differences were found in the number of days the patients required mechanical ventilation (P=0.014), ventilator day (P=0.01) and mortality rate between obese and non-obese group. As ISS increased, obese group had more significant mortality (P=0.045).

Conclusion: High BMI is associated with increased mortality and depends on mechanical ventilation. Obesity is an independent risk factor for mortality in head injury patients in ICU. Therefore there is this question that if it is necessary to put weight loss in the therapeutic chart in obese trauma patient in ICU.

PSYLLIUM FIBER REDUCED TRIGLYCERIDE, CHOLESTEROL, LDL-CHOLESTEROL, BUT ENHANCED LEPTIN LEVEL IN OBESE INDIVIDUALS

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Purpose: The objective of this study was to determine whether psyllium fiber supplementation would reduce body weight, or change lipid metabolism and hormone expression, and to further assess its impact on cardiovascular disease.

Methods: Overweight or obese adults (BMI > 27) who were no heart disease history were recruited from advertisement. Participants were divided into test and placebo group randomly. Psyllium supplementation of 12 g/d were packed in a bag and provided to the test group for 2 months. Compared to the test group, the same contents except psyllium supplements were provided to the placebo group. Before launching the study, participants' body weight, body fat, fasting glucose, triglyceride, cholesterol, LDL-C, HDL-C, leptin and adiponectin were measured and so did in the middle and the end of the study.

Results: In the intent-to-treat (n = 76) and protocol completers (n = 54) analyses, there were no significant differences in body weight and body fat, fasting glucose (P > 0.05) between the test group (Psyllium supplementation) and the placebo group. However, triglyceride, cholesterol, LDL-C and leptin in the test group were significantly lower than those in the placebo group (P < 0.05).

Conclusion: Psyllium fiber supplementation did not significantly reduce body weight and body fat in overweight or obese individuals in this study. However, the psyllium fiber appeared to attenuate triglyceride, cholesterol, LDL-C and enhance leptin level. These results suggest that psyllium fiber might have potential effect on improving overweight or obese individuals' lipid profile.

THE OBESITY STUDY IN COMMUNITIES GROUPS IN CHINA

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Objective: To study the features of center obesity people aged 35 years and above in communities in 13 provinces of China.

Methods: By cluster sampling, 42262 people were selected from the residential communities. Medical history was documented and measurements of body height, body weight, waist circumference. Fasting plasma glucose (FPG) and total cholesterol were also detect.

Results: 13535 people was overweight (32.0%) and 4361 people was obesity (10.3). 2028 people was center obesity in male, 3639 in female. Moreover, overweight/obesity and central obesity with hypertension, diabetes, dyslipidemia and impaired fasting glucose were detected.

Conclusion: The prevalence of center obesity had been increasing. Control body weight seemed to be a useful way to prevent non-communicable chronic diseases in communities.

PREVALENCE OF OBESITY AMONG KUWAITI ADOLESCENTS (10-14 YEARS) IN KUWAIT

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Objectives: The purpose of this cross-sectional study to find out the prevalence of obesity and overweight among intermediate school adolescents aged 10-14 years. The study comprised a multistage stratified random sample that included 5402 children (2657 males and 2745 females). They represent 12.7% of the total number of children between 10-14 years during the educational year 2005/2006.

Methods: Weights and heights of adolescents were measured, from which the body mass index (BMI) was calculated which is the weight in kilograms divided by the height in meters squared (kg/m^2). BMI values higher than 95 percentile were accepted as being obese and those in between 85-94 percentile were accepted as overweight. Dietary intake was assessed by the investigators by using food exchange lists designed by food exchange lists designed by faculty of Home Economy-Menofia university - Department of nutrition and food technology in Egypt⁽¹⁹⁾ and physical fitness was measured by modified Harvard step test. Data regarding monthly income of the chosen sample was collected from parents of those children.

Results: The overall prevalence of over weight and obesity in adolescents Kuwaiti children aged 10-14 years was 30.7% and 14.6% respectively. The overall prevalence of over weight and obesity among males was 29.3% and 14.9% respectively ($P < 0.001$) and the prevalence of overweight and obesity among females was 32.1% and 14.2% respectively ($P < 0.001$). High daily caloric intake by the obese and overweight children and physical inactivity was reported among the majority of them.

Conclusion: Health education programmes should be conducted to control this syndrome in order to prevent future risk of obesity related disease and physical activity programmes should be put in the schools. Any management plan for overweight and obese children should include three major components: diets, exercise and family based behavior and they should not be placed on restrictive diets because adequate calories are needed for proper growth.

Keywords: Childhood obesity, overweight, adolescence, Kuwaiti children.

SKELETAL MUSCLE 11 β HSD1 ACTIVITY IS NOT INFLUENCED BY ADIPOSITY OR INSULIN RESISTANCE IN NON-DIABETIC SUBJECTS

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Objectives: Local activation of glucocorticoids in insulin target tissues by the enzyme 11 β hydroxysteroid dehydrogenase type 1 (11 β HSD1) has been implicated in the aetiology of the metabolic syndrome. In adipose tissue, 11 β HSD1 is upregulated in obesity, leading to the generation of higher tissue levels of cortisol which in turn may act to increase insulin resistance. We have previously demonstrated that subjects with type 2 diabetes have reduced 11 β HSD1 activity in skeletal muscle (SkM), the main site of insulin-mediated glucose disposal. We aimed to determine if there is any relationship between SkM 11 β HSD1 and markers of adiposity and insulin resistance in normoglycaemic subjects.

Methods: Twenty non-diabetic volunteers (12 F and 8M), mean age 55 ± 13 years underwent a single fasting blood sample for glucose, insulin and adiponectin followed by a muscle biopsy of vastus lateralis performed under local anaesthesia and midazolam sedation. SkM 11 β HSD1 oxoreductase activity was determined by measuring the conversion of radiolabelled ³H cortisone to cortisol by thin layer chromatography performed within 4 hours of the biopsy.

Results: There was a wide range of BMI among the subjects (21.5 to 47.6, mean 30.4 ± 1.6 kg/m^2). There was no correlation between BMI and 11 β HSD1 activity ($r = 0.07$, $p = 0.78$) nor between HOMA and 11 β HSD1 activity ($r = -0.7$, $p = 0.76$). Similarly there was no correlation between adiponectin and 11 β HSD1 activity. There were significant correlations between BMI and HOMA ($r = 0.53$, $p = 0.018$) and BMI and adiponectin ($r = -0.49$, $p = 0.034$) as expected, but a greater correlation between waist-hip ratio and adiponectin ($r = -0.61$, $p = 0.005$). When subjects were categorised according to obesity (BMI < 30, $n = 11$, or >30, $n = 9$), there was no difference between the groups in SkM 11 β HSD1 activity ($17.7 \pm 2.3\%$ (BMI < 30) vs $16.1 \pm 2.2\%$ (BMI > 30), $p = 0.62$).

Conclusion: SkM 11 β HSD1 oxoreductase activity is not influenced by adiposity or insulin resistance in non-diabetic subjects.

EFFECTS OF ORIENTAL TREATMENT (MOXIBUSTION) FOR SPONTANEOUS FATTY II DIABETES RAT

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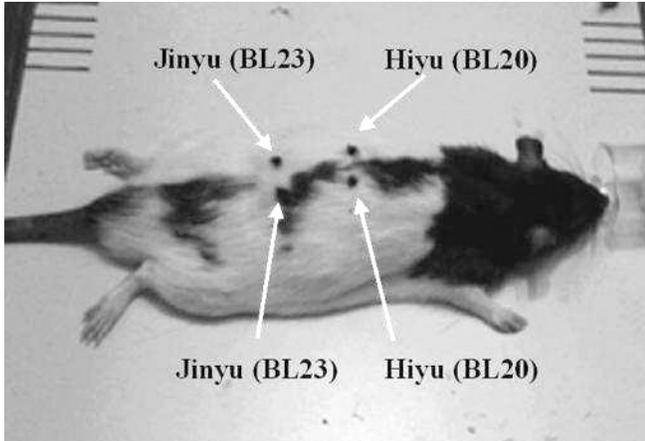
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Introduction: The biological responses oriental treatment (moxibustion) have been widely studied from the perspective of possible health effects. It has been reported that moxibustion stimulation has beneficial effects on chronic complaints.

Object: In order to examine the effectiveness of moxibustion for diabetes disease we investigated using Otuka Long-Evance Tokushima Fatty (OLETF) rat and Long Evance Tokushima Otuka (LETO) rat.

Method: Twelve male OLETF rat and six male LETO rat were divided three groups(5 weeks old, 90-100g).

Group I(OLETF) rats were treated with moxibustion stimulation (Figure 1).



[Figure1]

Group II(OLETF) rats were not treated with moxibustion stimulation and they served as a control group.

Group III(LETF), also were not treated with moxibustion stimulation, and they served as the normal control group.

Moxibustion stimulation was performed under ether anesthesia at 2 sessions per week for a total 24 sessions.

In each group, we measured body weight(BW), blood sugar(BS), urine albumin(UA), pain-related time(PRT) (Ugo Basile Planter test 7370, UGO BASILE, Italy) and blood flow volume(BFV) (PeriScan PIM II, PERIMED Co. Ltd, Sweden) before and after the moxibustion stimulation. Moreover, kidney and pancreas tissues were observed (Hematoxilin-Eosin(HE)).

Result: In group I II, BW, BS and UA increased in comparison with that of group III, as rats grew older. But group I showed suppression the increase in comparison with that of II group. After moxibustion stimulation, group I showed reaction sensitivity in comparison with group II. Group I showed suppression the decrease of BFV. Tissues didn't more seriously each group.

Conclusions: The possibility that moxibustion stimulation only affects the symptoms of diabetes disease cannot be ruled out.

We consider that it is important to provide moxibustion therapy in combination with western medicine for the treatment of diabetes disease.

Keywords: Otuka Long Evance Tokusima Fatty (OLETF), moxibustion, diabetes disease, blood flow volume.

OBESITY AND SYSTOLIC PEAK VELOCITY IN CEREBRAL AND CAROTID ARTERIES IN A MIDDLE-AND-AGED CHINESE POPULATION

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Background and purpose: The increased stroke risk experienced by obese persons hasn't been explained. Blood flow velocity in the cerebral arterial circulation (Vs) may be a contributing factor but this velocity in obese persons is not known.

Methods: A population-based sample of 1304 Chinese men and women (aged from 43 to 74, male 36%) without stroke were surveyed in year 2002. We used trans-cranial Doppler to measure Vs in common, internal and external carotid arteries (CCA, ICA, and ECA) and in middle cerebral, vertebral and basilar arteries (MCA, VA and BA). The associations of the Vs to body mass index (BMI) and waist circumference (WC) were analyzed.

Results: After adjusting for gender and age, Vs in CCA, ICA, ECA, VA and BA decreased significantly in overweight/obesity groups compared with normal-weight group. Similarly, there were gradual decreases of Vs in CCA, ICA, ECA, VA, BA from normal-weight, abnormal BMI or WC to abnormal BMI and WC. After adjusting for traditional cardiovascular risks, BMI was inversely associated with Vs in CCA, ICA, ECA, VA, and BA, and WC was inversely associated with Vs in CCA, ICA, VA, BA.

Conclusion: In apparently healthy Chinese adults, obesity is associated with a decrease in blood velocity in the extra-cranial cerebral circulation.

Keywords: Obesity Systolic Velocity Trans-cranial Doppler Carotid artery Cerebral circulation.

ISLAMIC FASTING REDUCE BODY WEIGHT AND IMPROVES BLOOD LIPID PROFILE IN NORMAL AND OBESE SUBJECTS

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Fasting is performed in different communities with different believes and for the management of body weight but in Islam the Muslim observes fasting in the Holy Month of Ramadan as an obligation. Therefore, this study was designed to know the effect of fasting on the obesity factors for example body weight, serum adiponectin, serum lipids. Twenty volunteers (male & female) from the international Islamic University Malaysia (IIUM) were recruited in Ramadan. Among the subjects 10 were normal weight (five male and five female) and 10 were obese (five male and five female). Age sex, weight, height and menstrual cycle status (in case of females) were recorded on day1 of the Ramadan and body weight was also recorded on day 21. Blood samples were collected on the Day1 of the Ramadan followed by another three collection of blood samples .i.e. day7, 14 & 21 respectively. The blood serum was separated and stored at -20C°. From weight & height basal metabolic Index (BMI) was determined. The blood was analyzed for glucose, adiponectin and lipid profiles. After 21 days of Ramadan fasting body weight was significantly (P < 0.001) reduced in the obese individuals. The weight reduction was accompanied by the reduction in triglycerid, total-cholesterol (Total-c), low density lipoprotein cholesterol (LDL-c), high density lipoprotein cholesterol HDL-c, Total-c & HDL-c ratios and diponectin. In the normal male

subjects the percent increase or decrease in the blood glucose, Total-c, LDL-c, HDL-c, Total-c & HDL-c ratios and diponectin was -18.26, -34.40, -18.16, -20.96, -6.33, -12.57 respectively and in the obese male subject it was +5.25, -21.71, -16.92, -28.45, +21.24, -31.02 and -24.74 % respectively. Similarly, in the normal female subjects the percent increase or decrease in blood glucose, Total-c, LDL-c, HDL-c, Total-c & HDL-c ratios and diponectin was -14.68, +11.11, -22.31, -39.40, 0.00, -25.48 and -13.54 respectively and in the obese female subjects it was +2.84, -20.90, -20.00, -22.52, -14.01, +0.56 and +0.40% respectively.

This study shows that fasting reduce body weight and improves blood lipid in normal and obese subjects.

CONSTITUENTS OF RHODIOLA ROSEA SHOWING MOUSE LIPASE INHIBITION

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Aims: The rhizome of *Rhodiola rosea* is an important traditional medicine in northern part of Eurasia. Its methanol extract had been found to have an inhibitory activity on lipase in isolated mouse blood plasma in vitro and gastrointestinal tract in vivo. In this study, the active components of this plant were isolated and investigated the lipase inhibition in vitro and in vivo.

Methods: The assay of lipase activity in isolated mouse plasma was carried out according to the BALB-DTNB method. The triglyceride level in the blood collected through the mouse tail vein was measured by GPO-DAOS method using a kit. The experimental conditions of HPLC were as follows: column, Capsell Pak C₁₈ (2.0mm i.d.×250mm); mobile phase, 5% acetonitrile in water acidified with 1.0% formic acid (solvent A) - 95% acetonitrile in water acidified with 1.0% formic acid (solvent B) (A:B, 95:5 → 60:40; 60min); flow rate, 0.3mL/min; detector, UV at 254nm; column temperature, 35°C.

Results: After fractionation and separation processes of methanol extract of the rhizome of *R. rosea*, rhodionin and rhodiosin were isolated as active constituents. The inhibitory effects of both constituents were concentration-dependent and their IC₅₀ values were 0.093mM and 0.133mM in vitro, respectively. Rhodionin (150mg/kg, p.o.) and rhodiosin (200mg/kg, p.o.) significantly suppressed the elevation of blood triglyceride level after load of olive oil, e.g., by 45.6% (60min after oral administration) and 57.6% (180min after oral administration), respectively. The contents of both compounds in the extract were estimated by HPLC, that was, rhodionin and rhodiosin were 1.9% and 7.3%, respectively.

Conclusions: Rhodionin and rhodiosin, constituents of *R. rosea*, may be anticipated to contribute to the mild improvement of postprandial elevation of blood lipid concentration through lipase inhibition in the gastrointestinal tract. Hence, we expect the application of this plant and its constituents for the prevention and treatment of life-style-related diseases such as hyperlipidemia and exogenous obesity.

REMISSION OF NAFLD AND DIABETES TYPE II AFTER LSG METABOLIC SURGERY

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Background: Weight loss in obesity results in marked improvement or resolution of hypertension, diabetes mellitus, and hyperlipidemia. The effect of weight loss on nonalcoholic fatty liver disease (NAFLD) seems to improve the liver function. These results showed spectrum of liver pathology by patients with diabetes type II morbid obesity.

Methods: Between February 2003 and December 2008 we performed 100 consecutive sleeve gastrectomy (LSG) operations by diabetes type 2 patients with morbid obesity. LSG was performed as standard procedure. By each procedure were performed preoperative laboratory tests, liver sonography and intraoperative liver biopsy. The improvement of NAFLD was measured by improvement of sonography and laboratory tests results. Primary outcome measures were improvement and resolution in the 4 components: steatosis, steatohepatitis, fibrosis and cirrhosis.

Results: A total count of 100 consecutive patients was evaluated. We found following changes by our patients: 23 steatosis, 50 steatohepatitis, 9 fibrosis and one cirrhosis. In all examined groups with NAFLD the HbA1c level was pathological. Triglycerides were elevated mostly by patients with steatosis hepatic. Lipids pathology progress corresponded with increasing of HbA1c level.

Conclusions: NAFLD seems improve in the majority of patients after bariatric surgery-induced weight loss. The severity of diabetes type 2 corresponds with the lipid pathology.

IS OBESITY A RISK FACTOR FOR ADVANCED COLON POLYPS?

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Introduction: Colorectal cancer is one of the most common cancers worldwide. It is widely recognized that the majority of colorectal cancers arise from neoplastic polyps. Obesity is associated with an increased risk of development of colonic adenomatous polyps and colorectal cancer. However, the influence of obesity on the development of advanced colon polyps is not clear. We compared the clinical characteristics of subjects with advanced polyps and subjects without advanced polyps, and examined the relationship between advanced colon polyps and obesity in health check-up subjects in Korea.

Methods: A total of 232 adenomatous polyp patients diagnosed with colonoscopy during cancer screening between January 2005 and June 2008 were included in this study. An advanced polyp was defined as an adenomatous polyp with one or more of the following features:

1. a diameter of 1 cm or larger,

2. a villous histology, and
3. high-grade dysplasia or adenocarcinoma.

BMI was assessed, and histology, size, and location of the adenoma were recorded for each patient. Total fat area, visceral fat area, and subcutaneous fat area were measured using abdominal computed tomography to evaluate abdominal obesity.

Results: Of 232 patients, 175 (75.43%) were male and 57 (24.57%) were female. The polyp number was significantly higher in males than females (1.61 ± 0.09 vs. 1.19 ± 0.07 , respectively). Furthermore, males had a significant higher BMI (24.49 ± 0.16 vs. 23.52 ± 0.31), total abdominal fat area (280.50 ± 6.79 vs. 229.50 ± 10.15), and visceral fat area (150.53 ± 4.67 vs. 82.98 ± 5.95) than females. Advanced polyps were positively associated with polyp number, BMI, total fat area, subcutaneous fat area, and visceral fat area in males. In females, advanced polyps were positively associated with BMI and subcutaneous fat area.

Conclusion: There are significant clinical differences between male and female asymptomatic patients with adenomatous colon polyps. Our data suggest that abdominal obesity is associated with the presence of advanced colon polyps.

ASSOCIATION BETWEEN BODY COMPOSITION AND PULMONARY FUNCTION IN ELDERLY PEOPLE: THE KOREAN LONGITUDINAL STUDY ON HEALTH AND AGING

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Background: The age-related increase in body fat and decrease in muscle mass are associated with increased morbidity in elderly populations. Pulmonary function may also be associated with the body composition change. To investigate whether regional body composition is associated with pulmonary function in elderly.

Methods: The Korean Longitudinal Study on Health and Aging is a community-based cohort study of people aged more than 65 years selected by random stratified sampling (mean age = 76.0 ± 8.7 years). Anthropometrics, biochemical factors and lung function by spirometry were evaluated in 439 men and 561 women. Bioelectrical impedance analysis and dual energy X-ray absorptiometry were performed to assess whole and regional body composition. Computed tomography was also used to measure fat or muscle distribution at the abdominal and mid-thigh levels.

Results: Pulmonary function and muscle mass decreased with age, but fat mass didn't. After adjusting for age, sex, body mass index, smoking and exercise status, participants with less muscle mass in the trunk or mid-thigh level had poorer lung function than those with more muscle mass in the same areas ($P < 0.05$). Subjects with more fat in the whole body or trunk had poorer lung function ($P < 0.05$). Further adjustment of hsCRP, an inflammatory marker, similar results were obtained.

Conclusions: The results show that body composition is strongly associated with lung function. Lung function correlated positively with muscle mass in the trunk or mid-thigh area and negatively with fat in the whole body or trunk area.

BIRTH WEIGHT, MATERNAL SIZE, AND EARLY CHILDHOOD GROWTH: A PROSPECTIVE BIRTH COHORT STUDY IN CHINA

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Objective: The relations of birth weight and maternal size with fatness remain unresolved. We prospectively examined the relations of birth weight with various anthropometric measures at age 3-6 years, the effect of maternal size and the patterns of the relations over refined birth weight categories.

Methods: Subjects were 210 172 singleton infants born alive with gestational age ≥ 28 weeks between October 1993 and December 1996, and followed up in 2000. Birth weight, maternal height and weight, and relevant information were measured or collected prospectively. Overweight and underweight were defined by NCHS/WHO corresponding reference data. Logistic regression models were applied to estimate relative risks. Stratified analyses by the quartile of maternal body mass index (BMI) were performed to examine the effects of maternal size on birth weight-fatness association.

Results: Birthweight was linearly associated with children's height, weight and BMI at age 3-6 years. Adjustment for maternal size did not change the results. Birthweight was positively associated with overweight, and negatively with underweight. The shapes of the relations looked like a half of flat U-curve for both overweight and underweight. The association was stronger in the top quartile of maternal BMI for overweight, and stronger in the bottom quartile for underweight.

Discussion: Higher birthweight is associated with an increased risk for childhood overweight, and lower birthweight increases the risk for underweight. The associations between birthweight and early childhood anthropometric growth measures could not explained by maternal size.

OBESITY AND THE ELDERLY: AN UPDATED REVIEW

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Objectives: Obesity is a major public health concern in developed countries; however, there is little data available on the prevalence and impact of obesity within the elderly population. This review examines the prevalence and health effects of obesity among individuals aged ≥ 50 .

Methods: Medline (1996-2009) search engine was used to retrieve qualified peer-reviewed articles focusing on obesity or a health condition correlated with obesity using BMI or other weight index as a defining variable; and studies limited to the elderly (age 65+) or pre-elderly (50+).

Results: Worldwide, the elderly population is increasingly becoming obese regardless of socio-economic status. Among the elderly, obesity increases the risks of cancers, diabetes, hypertension, stroke, heart disease, metabolic syndrome, obstructive sleep apnea syndrome, osteoarthritis, depression, disability, and lower scores on quality of life measures. In recent reports, obesity in middle age has been linked to Alzheimer's disease and other

forms of cognitive decline, whilst higher measures of all adiposity measures have been associated with worsening cognitive function in older men but not women. Obesity significantly increases healthcare costs.

Conclusions: Obesity is increasing in the elderly population worldwide and is expected to continue to rise. Obesity is associated with disease and disability in addition to escalating healthcare costs. Thus, it may be a pertinent health goal to reduce excess weight before middle age to avoid complications subsequently during the elderly years. The vexing issue of 'obesity paradox' with age and sex will be discussed.

PHYSIQUE AND BLOOD PREASURE OF RURAL SOUTH AFRICAN CHILDREN AGED 6 TO 13 YEARS: ELLISRAS LONGITUDINAL GROWTH AND HEALTH STUDY

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Background: Physique has been useful in assessing the outcome of underlying growth and maturity processes, which leads to a better understanding of variation in child and adult health. However, a high endomorphy rating has been associated with hypertension in adults posing a serious threat to their health status, while receiving little attention in children.

Aim: To determine the association between somatotypes, body mass index (BMI) and blood pressure (BP) in 6-13-year-old rural children, in Ellsiras, South Africa.

Subjects: 1902 subjects (980 boys and 922 girls), aged 6-13 years were studied as part of the Ellsiras Longitudinal study. Height, weight, four skinfold sites, two breadths, and two girths were measured according to the International Society for the Advancement of Kinanthropometry (ISAK). The Heath-Carter method of somatotyping was used, together with internationally recommended cut-off points for BMI in children. Hypertension, defined as the average of three separate BP readings, where the systolic or diastolic BP is greater than or equal to the 95th percentile for age and sex, was determined.

Results: The prevalence of hypertension ranges from 1-5.8% in boys and 3.4-11.4% in girls. For overweight range is from 1.1-2.9% in boys and 0.6-4.6% in girls. Systolic BP and BMI showed a significant positive correlation at age 6 years ($r=0.436$) and 10-13 years ($r=0.180$ to 0.246 in boys and $r=0.221$ to 0.271 in girls). Diastolic BP showed an insignificant correlation with the BMI and somatotype components in boys and girls.

Conclusion: A significant association exists between BP and BMI, and ectomorphy components even after being adjusted for age, gender and height. The need to manage hypertensive individuals is evident in this sample to combat this chronic disease from an early age. Follow-up studies should investigate the relationship between BP and the dietary intake of these children.

PARITY IS ASSOCIATED WITH TO INCREASE WAIST CIRCUMFERENCE AND OTHER ANTHROPOMETRIC INDICES OF OBESITY

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Background: There is growing interest in the effect of childbearing on the development of chronic medical conditions. In the present study we need to see whether parity is associated with increased waist circumference (WC) and other anthropometric indices of obesity, or not, in a sample of Iraqi women.

Methods: This was a cross sectional study conducted during the period from January 2006 to the end of December 2007. Subjects were women attending two primary health care centers in a rural district population in Basrah (Abu-Al-khasib district), Iraq.

Results: A total of 9,135 women with the mean age of 46.4 ± 15.5 years were included in the study. The mean weight was 69.9 ± 16.9 kg and the mean WC was 92.7 ± 15.0 cm with 78.9% of women having WC ≥ 80 cm. The mean and the standard deviation of other anthropometric variables were 27.0 ± 6.25 for body mass index (BMI), 0.57 ± 0.09 for Waist-to-Height ratio (WHtR) and 0.89 ± 0.08 for Waist-to-hip ratio (WHpR). Body weight, WC, BMI, WHpR, and WHtR progressively and significantly increased with increasing parity ($p < 0.001$). Increasing age and higher number of births were associated with a consistent significant increase in the risk of increasing WC. While the reverse was true with respect to education, the risk of increased WC significantly decreased with the increase in education. The risk of increased WC was higher among housewives compared to employed women.

On multiple logistic regression analyses of parity and risk of increasing WC, the number of births remained significantly and independently associated with increased WC after adjustment for a range of potential confounders (age, BMI, employment, education, and marital status). However, when parity was analyzed as a dichotomous variable (parous versus nulliparous), no significant association was found ($P > 0.05$).

Conclusion: Parity was associated with increased WC and other anthropometric indices of obesity in a sample of rural Iraqi women attending two primary health care centers.

CHROMIUM SUPPLEMENTATION PREVENTS AGAINST HIGH FAT DIET-INDUCED OBESITY IN C57BL/6J MICE

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Aims: Obesity is a major health problem and main cause of most geriatric diseases in developed countries. Studies indicate that insulin and leptin resistance are primary risk factors for obesity. Chromium, an essential nutrient required for glucose and lipid metabolism, is used as a supplement to improve insulin resistance in diabetes. The aim of this study was to investigate the anti-obesity effect of chromium in high fat diet-induced obese mice.

Methods: Male C57BL/6J mice were randomly divided into 3 groups: normal diet, high fat diet and high fat diet supplemented with chromium-containing milk concentrate capsule for 8 weeks.

Results: In comparison with the normal diet-fed mice, mice fed with high fat diet successfully induced obesity as evidenced by increases in body weight, fat pads and adipose cell size. Chromium supplementation significantly reduced body weight gain, fat pad accumulation and adipose cell size in high fat diet-induced obese mice. The anti-obesity effect of chromium was accompanied by an increased expression of insulin receptor substrate 1 (IRS1) and p85 α regulatory subunit of phosphatidylinositol 3-kinase (PI3-k p85 α) and phosphorylation of signal transducer and activator of transcription 3 (pSTAT3) in the liver. Additionally, hyperglycemia, hypercholesterolemia, hyperleptinemia and insulin resistance were alleviated by chromium supplementation in C57BL/6J mice fed with high-fat diet.

Conclusions: Our preliminary results indicate that chromium-containing milk concentrate capsule exerts beneficial effects against obesity in mice fed with high-fat diet, which may be associated with improved insulin and leptin resistance.

THE NEGATIVE EFFECT OF CARBONATED DRINKS ON WEIGHT LOSS AND ABDOMINAL FAT ARE RELATED TO OXIDATIVE STRESS

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Objective: The study investigated the effect of 'regular' and 'diet' carbonated soft drinks on weight and waist circumference changes as well as oxidative stress parameters in overweight and obese individuals on two different weight loss formulae (AL60 and DG60).

Method: 320 overweight and obese participants (aged 18 to 54 years; BMI \geq 25.1) were randomly divided into 10 groups. Participants in the control groups received 600 ml carbonated water per day, as well as 200mg of one of two tested weight loss formulae, AL60 or DG60 (CAL60, CDG60). Participants in the test groups received 600 ml per day of one of the following carbonated soft drinks: RC, DC, RP, DP, as well as 200 mg of either AL60 or DG60 (RCAL60, RCDG60, DCAL60, DCDG60, RPAL60, RPDG60, DPAL60, DPDG60). Weight and waist circumference was measured weekly, and 5 ml blood samples were collected once a week for a six week period, for the measurement of oxidative stress parameters (MDA, FRAP, thiol proteins and catalase).

Results: After 6 weeks, the control groups lost an average of 4.87 \pm 1.12 kg, while the groups on 'regular' carbonated drinks - RCAL60, RCDG60, RPAL60 and RPDG60 groups lost 0.87, 1.02, 1.13 and 0.98 kg respectively. These weight changes paralleled the changes in weight circumference.

On the other hand, the groups on the 'diet' drinks -DCAL60, DCDG60, DPAL60 and DPDG60 gained 0.73, 0.38, 1.48 and 0.67 kg respectively. In the same time period, oxidative stress parameters were significantly higher in the RCAL60, RCDG60, RPAL60 and RPDG60 ($p < 0.05$) as well as in the DCAL60, DCDG60, DPAL60 and DPDG60 groups ($p < 0.01$) compared to the control groups.

Conclusions: Oxidative stress as induced by carbonated soft drinks had a negative effect on weight loss and reduction of waist circumference brought

about by AL60 and DG60. This negative effect was more pronounced in 'diet' compared to 'regular' soft drinks.

HOUSEHOLD MOTOR VEHICLE USE AND WEIGHT STATUS AMONG COLOMBIAN ADULTS: ARE WE DRIVING OUR WAY TOWARDS OBESITY?

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Objective: Given that mobilization patterns in Latin-American cities are rapidly shifting towards the use of private motorized transportation, the relationship between motor vehicle use and obesity warrants exploration. This study offers a unique opportunity to explore the topic in a cross sectional manner in a low-middle income country. The objective of this study is to determine the associations between household motor vehicle ownership and excess adiposity in a representative sample of Colombian adults residing in urban areas.

Methods: Secondary analysis of data from the 2005 Demographic and Health Survey of Colombia. Height, weight and waist circumference were objectively measured in 49,079 adults, ages 18 to 64 that resided in urban settings. Abdominal obesity was defined as a waist circumference > 80 cm in women and > 90 cm in men.

Results: Prevalence was 19.9% for motor vehicle ownership in household, 33.1% for BMI between 25 and 29.9 kg/m², 14.4% for BMI > 30 kg/m², and 46% for abdominal obesity. Males reporting any household motor vehicle ownership were more likely to be overweight or obese, and to have abdominal obesity (p for gender exposure variables interaction = < 0.001).

Conclusions: Household motor vehicle ownership is associated with overweight, obesity, and abdominal obesity among Colombian men but not women. The results of the present study indicate that among Colombian men, there is a cross sectional association between motor vehicle ownership and overweight, obesity, and abdominal obesity. If this association is proven to be causal, interventions and policies aimed at facilitating active transportation and reducing unnecessary and/or excessive use of private motor transportation could assist in controlling and preventing the ongoing obesity epidemic in Latin America.

DETERMINANTS OF HEALTHY BEHAVIOR AMONG OBESSE WOMEN IN BALLABGARH, FARIDABAD, HARYANA; A QUALITATIVE STUDY

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Objective: Obesity is emerging as a public health problem in India, especially in urban areas and among women. One of the strategy to combat obesity is to improve the behavior (low fat, high fiber diet and increased physical

activity) of the population. This qualitative study was conducted to understand the determinants of healthy behavior among obese women residing in Ballabgarh.

Methodology: We conducted 10j0 qualitative open ended in-depth interviews (IDIs) among obese women (BMI \geq 30 kg/m²). Participants were selected by purposive sampling. The interview schedule included questions regarding self body image, awareness about health risks of obesity, prevailing weight reduction practices and barriers and enabling factors for weight control practices.

Results: It was observed that the women had appropriate self perception of weight. Awareness about healthy diet and physical activity behavior was found to be good. We found the following determinants for the healthy behavior among women.

- Personal determinants: Weight concern, perceived necessity to reduce weight, knowledge of healthy practices, and motivation by advice of a doctor, perceived benefits of the healthy practices, body aches and pains and availability of time.
- Socio-cultural determinants: Attitude of community towards obese women, role of gender in food preparation, care giving activities and cultural unacceptability of leisure time activity.
- Environmental determinants: availability and affordability of fruits and vegetables, presence of modern gadgets at home, availability of good roads and accessibility to parks.

Conclusions: Presence of multiple determinants for healthy behavior warrants multisectoral approach to tackle the problem of obesity in India.

HEALTH PROMOTION TO PREVENT OVERWEIGHT AND OBESITY AMONG STUDENTS OF MIDWIFERY ACADEMY

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Background: Overweight and obesity nowadays are becoming endemic all over the world. The prevalence of obesity in Indonesia is increasing. The prevalence of overweight and obesity among students of midwifery academy at Pematang Siantar is 12.5% obese and 13.4% overweight. Both overweight and obesity are caused by imbalance between energy intake and energy release. This happens due to lack of knowledge, attitude and behavior in preventing overweight and obesity problem. An effort to improve knowledge, attitude and behavior is through health promotion which may consist of group counseling, use of transparencies and booklet.

Objective: To analyze the influence of group counseling and use of transparencies and booklet on how to prevent overweight and obesity to knowledge, attitude and status of overweight and obesity.

Method: The study was quasi experimental which used pre test and post test non equivalent group design. Data analysis used paired t-test and independent t-test. Population of the study were overweight and obese

students of midwifery academy. Samples were chosen according to certain criteria. Research instruments used were questionnaires.

Result: Group counseling and use of over head projector and booklet on the prevention of overweight and obesity improved knowledge, attitude and behavior of experiment group. It was indicated from the difference in knowledge, attitude and behavior during pre test and post test 1 and 2. After the experiment group was given health promotion, there was difference in knowledge (p=0.000; p< 0.05), attitude (p=0.000; p< 0.05) and behavior (p=0.000; p< 0.05), whereas status of obesity decreased to overweight (p=0.044; p< 0.05).

Conclusion: Group counseling and use of over head projector and booklet improved knowledge, attitude and behavior about the prevention of overweight and obesity. Status of obesity decreased to overweight among students of midwifery academy.

Keywords: Group counseling, booklet, overweight, obesity, knowledge, attitude, behavior, health promotion.

CORRELATION BETWEEN BMI AND CARIOUS FREQUENCY IN 3225 CHILDREN OF ELEMENTARY SCHOOLS

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Introduction: Within the last decades a tremendous increase in both overweight adults, adolescents and children could be observed. The objective of this study was to investigate the association between BMI and caries frequency in German elementary school children.

Methods: This study was conducted as cooperation between the Dental Hospital, the Department of Pediatrics of the University of Mainz as well as with the Association of Dental Health of the State of Rhineland Palatinate. A total of 3225 elementary school children (51% boys, 49% girls; age 6 to 11 years) from different social backgrounds in Mainz (about 220.000 habitants) were examined. The medical evaluation assessed the pupils' general health and the body mass index (BMI); the dental examination included the determination of caries frequency (DF-T-/ df-t-values).

Results: The study showed that 4% of the children were underweight, 75% had a normal weight, 12% were overweight and 9% obese. Naturally healthy teeth were found in 38.8% of all children. Children with underweight showed healthy teeth in 50%, those with normal weight showed natural teeth in 47%, while children with high weight in 39% and obese children in 36% showed naturally healthy. A significant correlation between high weight and caries frequency in the first dentition (p= 0.0067 for df-t distribution) and in the permanent dentition (p= 0.0002 for DF-T distribution) could be observed. The association remains statistically significant after adjusting for age. The number of healthy teeth decreased with the age (p=0.001), BMI (p=0.0061) and was different between girls and boys (p=0.0334).

Conclusion: This study demonstrated a significant association between BMI and dental caries in children of elementary schools. In future preventive programs the importance of nutrition should not only be emphasized with respect to general diseases but also with regard to carious lesions.

HIGH WAIST CIRCUMFERENCE IS A RISK FACTOR FOR REFLUX ESOPHAGITIS IN JAPANESE MALES

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Background/aims: There have been increased in prevalence of reflux esophagitis, which might lead to development of Barrett's esophagus and esophageal adenocarcinoma. The aim of this study was assessing risk factors for reflux esophagitis.

Methods: We conducted a cross-sectional study of 1495 Japanese subjects undergoing health checkups (822 males and 673 females; median age, 50 years) at a tertiary care center from April 2007 to February 2008. They underwent upper gastrointestinal endoscopy, physical examination, and laboratory tests. Reflux esophagitis was diagnosed and graded according to the Los Angeles classification. Univariate and multivariate logistic regression analyses were performed to identify risk factors for reflux esophagitis.

Results: One hundred and twenty-seven subjects (8%) had reflux esophagitis, the disease of grade A was shown in 96 (76%), that of grade B in 27 (21%), that of grade C in 4 (3%), and that of grade D in none. Hiatal hernia was observed in 292 subjects (20%). Significant differences in clinical backgrounds were observed between females and males. Reflux esophagitis (13% vs. 3%) and hiatal hernia (28% vs. 9%) were more frequent in males than females (both $P < 0.0001$). Females with reflux esophagitis had higher frequency of hiatal hernia and higher levels of body mass index and aspartate aminotransferase. Multivariate logistic regression analyses revealed that hiatal hernia [odds ratio (OR) 6.63, 95% confidence interval (CI) 2.47-17.8; $P = 0.0002$] was the only predictive factor for reflux esophagitis in females. On the other hand, males with reflux esophagitis were younger and had higher frequencies of hiatal hernia and higher levels of body mass index, waist circumference, diastolic blood pressure, triglyceride, aspartate aminotransferase, gamma-glutamyltranspeptidase, and fasting glucose. By the multivariate logistic regression analyses, age (OR 0.96, 95% CI 0.94-0.99; $P = 0.007$), hiatal hernia (OR 3.16, 95% CI 2.05-4.87; $P < 0.0001$), and waist circumference (OR 1.09, 95% CI 1.02-1.15; $P = 0.006$) were associated with reflux esophagitis in males.

Conclusions: Risk factors for reflux esophagitis may be different between Japanese males and females. Abdominal obesity may be an important risk factor for reflux esophagitis in males compared with females.

Pathophysiology/Basic science/Animal studies

ALLEVIATION OF HIGH-FAT DIET-INDUCED FATTY LIVER DAMAGE AND ADIPOSE ACCUMULATION IN GROUP IVA PHOSPHOLIPASE A₂-KNOCKOUT MICE

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Aims: Obesity resulting from abdominal adipose accumulation is the main feature of metabolic syndrome progressing to fatty liver known as non-alcoholic fatty liver disease. Abdominal adipose accumulation and fatty liver are mainly associated with the excessive deposition of lipids including triglyceride in adipose tissues and the liver. The accumulation of lipids in these tissues is regulated by several factors including adipokines and prostaglandins. In the present study, we investigated the possible involvement of group IVA phospholipase A₂ (PLA₂), which catalyzes the first step in prostanoid biosynthesis, in the development of fatty liver, using group IVA PLA₂-knockout mice.

Results: Male wild-type mice, fed high-fat diets (20% fat and 1.25% cholesterol) for 8-16 weeks, developed hepatocellular vacuolation and liver hypertrophy with increases in hepatic triglyceride content and the serum levels of liver damage marker aminotransferases when compared with wild-type mice fed normal diets. However, these high-fat diet-induced alterations were markedly decreased in group IVA PLA₂-knockout mice. Under the high-fat dietary conditions, group IVA PLA₂-knockout mice had lower epididymal fat pad weight and smaller adipocytes than wild-type mice. In addition, the serum level of prostaglandin E₂, which has a fat storage effect, was lower in group IVA PLA₂-knockout mice than in wild-type mice, irrespective of the kind of diet. In both genotypes, high-fat diets increased serum leptin levels equally between the two groups, but did not affect the serum levels of adiponectin, resistin, NEFA, triacylglycerol, glucose, or insulin.

Conclusions: The present study demonstrates that a deficiency of group IVA PLA₂ protected mice against the high-fat diet-induced development of fatty liver damage with adipose accumulation. The alleviation of fatty liver damage is probably associated with the decreased circulating levels of prostaglandin E₂ in group IVA PLA₂-knockout mice. In addition, group IVA PLA₂ also may be involved in the regulation of adipose accumulation.

CHRONIC MATERNAL VITAMIN B12 RESTRICTION INDUCED CHANGES IN THE WISTAR RAT OFFSPRING ARE PARTLY CORRECTABLE BY REHABILITATION

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Objective: To study the effect of maternal vitamin B12 deficiency on body composition, lipid profile and glucose tolerance in Wistar rat and assess the reversibility/preventability of the changes by rehabilitating the restricted mothers from conception or parturition and their offspring.

Methods: Weanling Wistar female rats were fed for three months, a control (AIN 76 A) diet (n=12) or the same having restricted amounts of vitamin B12 (n=24). The rats were mated with control males. 6 pregnant B12R rats were rehabilitated with control diet from conception and their offspring weaned on to control diet, (B12RC). The remaining B12 restricted dams continued on restricted diet through out pregnancy. At parturition, six vitamin B12 restricted mothers were switched over to control diet (B12 RP) and their offspring weaned on to control diet. At weaning, half the numbers of B12 restricted offspring were supplemented with control diet (B12 RW), while the remaining offspring continued on restricted diet (B12R). The body composition was determined at intervals of three months while plasma lipid profile, glucose tolerance and blood cortisol were measured at 12 months of their age.

Results: B12R offspring were born with low birth weight, but had high weaning weights. Chronic vitamin B12 restriction significantly increased body weight and body fat % in Wistar rats and decreased lean body mass (LBM) % and fat free mass (FFM) % by as early as three months of age. This was associated with increased visceral fat and dyslipidemia at 12 months of age, in addition to fasting increased plasma insulin secretion, HOMA IR and impaired glucose tolerance. These changes were in general partially corrected by the rehabilitation. Blood cortisol levels were significantly higher in B12R offspring suggesting that glucocorticoid induced stress could underlie the above changes. That rehabilitation from conception, but not by parturition or weaning could restore the changes to that of controls.

Conclusions: Chronic maternal vitamin B12 restriction altered body composition, lipid metabolism and resulted in the development of insulin resistance in Wistar rat offspring. These changes were reversed by rehabilitation from conception but not later probably indicates the importance of vitamin B12 during pregnancy and lactation.

POCU1b, AN HERBAL MEDICINE, IMPROVES LIPID DYSREGULATION AND FATTY LIVER IN OBESE MICE THROUGH ACTIVATING AMP-ACTIVATED PROTEIN KINASE

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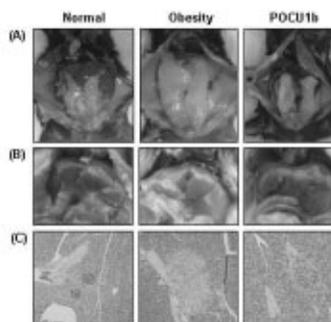
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Aims: AMP-activated protein kinase (AMPK) plays an important role in regulating whole body energy homeostasis. This study was to explore the effects of POCU1b, a natural plant product, on metabolic syndrome and fatty liver in obese mice.

Methods: The animal models, developed obesity, dyslipidemia and insulin resistance, were induced by high-fat-diet in C57BL/6 mice. POCU1b were treated orally for 10 weeks. The age-matched C57BL/6 mice fed with standard chow were used as normal control.

Results: POCU1b treatment reduced body weight gain, adipocyte size, liver weight, hepatic and plasma triglyceride, and cholesterol contents without altering food intake. POCU1b downregulated the expression of genes involved in lipogenesis and upregulated those involved in energy expenditure in adipose tissue. In addition, in the liver of diet-induced obese mice, POCU1b promoted AMPK activity and fatty acid oxidation. Furthermore, POCU1b administration also exhibited extensive effects on insulin resistance by improving plasma glucose, glycated hemoglobin and pancreatic insulin level.

Conclusions: All the results suggest that POCU1b displays beneficial effects in the treatment of metabolic syndrome and fatty liver in obese subjects, which is probably mediated, at least in part, by stimulation of AMPK activity.



[Figure 1]

Figure 1. Effects of daily administration of POCU1b on (A) epididymal fat mass, (B) fatty liver, and (C) insulin amount in the pancreas in mice with diet-induced obesity. Representative images from normal control mice (Normal), high-fat fed mice (Obesity), and high-fat fed rats treated with POCU1b (POCU1b).

A NEW OBESE RAT MODEL TO STUDY OBESITY AND CARDIOVASCULAR RISKS

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Obesity is no longer considered as a connoisseur’s dilemma, but viewed now as a health risk - a metabolic disease leading to progressive degenerative disorders. Both humans and animals are equally affected, when the food intake is unlimited and the energy expenditure is minimal. Many experimental and natural rodent models have been developed in the past and a recent entrant to this list is the obese rat model (WNIN/Ob and GR-Ob) developed at National Institute of Nutrition, Hyderabad, India. These have arisen spontaneously from the wistar stock of rats maintained at the institute and attain a weight over 1 kg as they cross one year. The average life span is 1!2 years and as they age they develop opportunistic infections, tumors, kidney abnormalities and quite few of them develop cataract and retinal degeneration. The homozygous obese animals show 48% fat in the body with the maximum fat in the abdominal region. Animals are hyperphagic, show hyperlipidemia, and are leptin resistant. The colony has completed 25 generations and in recent times started showing high blood pressure in addition to above abnormalities. Though spontaneous hypertensive rats are known in the past (like SHR rats), obese models with high blood pressure are few and far between. The WNIN obese rat show a systolic BP of 285 mm Hg compared to 135 mm of lean controls. The diastolic is also equally high, 120 mm Hg in obese versus 106 mm Hg in lean. This new model is thus an exciting rodent model with a potential to study hypertension and cardiovascular risks associated with obesity.

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IMPACT OF ABDOMINAL OBESITY IN INCREASING COST OF RESPIRATION AND WORKLOAD OF HEART

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Background: Obesity is one of the major public health problem becoming a worldwide epidemic. Obesity have impact on most of the systems of our body imparing the quality of life and productivity. Abdominal obesity have a major impact on the respiratory mechanics which eventually leads to increasing cost of respiration and workload of heart.

Aim: To determine the major pathomechanical changes in respiratory system in abdominal obesity & its impact in increasing work load of heart.

Methodology: An extensive literature search using search engines Medline, Ovid, Proquest, science direct, Cochorane, embase done. 67 articles retrived and the biomechanical alteration studied. Biomechanical changes specific to the abdominal aobesity pooled & the results were derived.

Results: There is significant evidence in altered biomechanical changes. There is altered movement of the diaphragm leading to improper lower costal mechanics is the major factor causing respiratory compromise. Abdomen muscle laxity leading to abnormal force dissipation during inspiration leading to reduced FRC, VC. these changes leads to reduced lung volumes & capacities & causing reduced basilar ventialtion & aelectasis a common problem (with level a evidence) there is also alteration in the length tension relationship of diaphragm & other respiartory muscles leading to increased insufficiency of muscles & increasing the energy demand (level b evidence) for increase in metabolic demands of the respiratory muscles indirectly leading to the increased work load f the heart. Altered pressure differences between the thorax & abdomen increasing the intrathoracic pressure pattern causing increase vascular pressure on great vessels creating a risk for vascular injuries & disorders.

Conclusion: The abdominal obesity is having a major impact in pathomechanical changes in the respiratory system causing increased work of respiration and thereby increasing the myocardial work load.

Pathophysiology/Clinical science/Human studies

ASSOCIATION BETWEEN ABDOMINAL OBESITY, INSULIN RESISTANCE AND LIVER FAT IN OBESE CHILDREN AND ADOLESCENTS

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Objective: Obese individuals with increased deposition of fat in the abdominal area are known to have an increased risk for insulin resistance and various other co-morbidities. The objective of this study is to explore these associations in obese children and adolescents.

Method: Measurement of anthropometry, abdominal obesity, liver fat deposition and insulin resistance were conducted in 144 obese children and adolescents. Abdominal obesity was determined by waist circumference and ultrasound measurement of abdominal fat (thickness of subcutaneous, pre-peritoneal and intra-abdominal fat measured at 5cm above the umbilicus). Ultrasound determination of liver fat deposition was arbitrarily quantified as 1+ or 2+ in comparison to the echogenecity of kidneys. Fasting glucose, insulin, lipids and liver enzymes were determined using venous blood. The homeostasis model assessment of insulin resistance HOMA(IR) was determined.

Results: There were 144 obese subjects (97 males, 47 females) with mean(SD) age of 9.0(3.2)years (range 2-18 years), mean(SD) BMI at 25.7(3.7)kg/m², mean(SD) waist circumference at 82.1(12.4)cm. 74% of children had BMI above the age- and gender-specific 97th percentile values. Mean(SD) abdominal subcutaneous fat was 2.99(0.84)cm, pre-peritoneal fat was 0.61(0.43)cm, intra-abdominal fat was 5.81(1.78)cm. 74.6% of subjects had increased liver fat (≥1+). These subjects had higher mean BMI (p< 0.001), thicker abdominal pre-peritoneal fat (p=0.052) and higher HOMA(IR)(p=0.002). All subjects had normal fasting glucose and mean(SD) insulin was 14.5(9.8)mIU/L. 56% of the children had HOMA(IR) ≥ 2.5. This subgroup of subjects had thicker abdominal subcutaneous fat (p=0.0007), pre-peritoneal fat (p=0.005) and higher fasting glucose (p< 0.0001). Abdominal subcutaneous fat thickness was positively correlated with HOMA(IR)(r= 0.50, p=0.0002). 83% of subjects with IRI ≥2.5 had increased liver fat as contrast to 48% of subjects with IRI < 2.5.

Conclusion: Results of this study show that an increase in level of obesity and abdominal fat is associated with increased deposition of liver fat and increased HOMA(IR). Those with increased HOMA(IR) are more likely to have increased deposition of liver fat. Such associations are already evident in the young. The findings add credence to the call for effective prevention of obesity and its co-morbidities, even in the young.

DYSREGULATION OF METABOLIC FACTORS AFTER AN ORAL GLUCOSE TOLERANCE TEST IN MEN WITH ABDOMINAL OBESITY

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Objectives: Postprandial metabolic dysregulation plays a role in the development of atherosclerosis. Visceral fat accumulation is an important component of various metabolic disorders including glucose intolerance, dyslipidemia and hypertension, which correlate with atherosclerotic cardiovascular disease. The aim of the present study was to compare the postprandial response of various metabolic parameters, blood pressure, adiponectin and oxidative stress to 75-gram oral glucose tolerance test (OGTT) in men with and without abdominal obesity.

Methods: Thirty consecutive Japanese middle-aged males on no medications, who visited the clinic and were newly diagnosed as mild hypertension and/or dyslipidemia were enrolled in the present study. According to the Japanese criteria of the metabolic syndrome, hypertension was defined as systolic blood pressure (SBP) ≥ 130 mmHg and/or diastolic blood pressure (DBP) ≥ 85 mmHg, and dyslipidemia represented high fasting triglyceride (TG) levels of ≥ 1.69 mmol/L and/or low high-density lipoprotein cholesterol (HDL-C) levels < 1.04 mmol/L. Then we divided the subjects into those with less than WC 85 cm (WC < 85 , n=7) and those with at least WC 85 cm (WC ≥ 85 , n=23). All individuals underwent an OGTT after overnight fast. To investigate the OGTT overloading, the subjects who were overt diabetes (fasting glucose levels were ≥ 7.8 mmol/L) were excluded.

Results: The percent change in each parameter [(each parameter at 120 minutes after an OGTT - that before an OGTT) / that before an OGTT $\times 100$] was calculated. The %SBP, %DBP and %TG were $-6.3 \pm 3.5\%$, $-9.4 \pm 3.0\%$, and $-10.2 \pm 2.1\%$, respectively, in the WC < 85 group (versus baseline, $p=0.10$, $p < 0.01$ and $p < 0.001$), and $2.0 \pm 1.7\%$, $0.9 \pm 2.4\%$, and $2.8 \pm 3.3\%$, respectively, in the WC ≥ 85 group (versus WC < 85 group, $p < 0.05$, each). However, there were no significant differences in %total cholesterol and %HDL-C between the two groups. The %thiobarbituric acid-reacting substances tended to be lower in the WC < 85 group (versus baseline, $p=0.07$), but not in the WC ≥ 85 group; and albeit statistically insignificant (the WC < 85 versus WC ≥ 85 group, $p=0.057$). The maximum carotid intima-media thickness was larger in the WC ≥ 85 group than the WC < 85 group ($p < 0.05$).

Conclusions: Evaluation of postprandial changes in obesity-related parameters may be important in preventing atherosclerotic diseases.

Physical activity/Exercise

THE EFFECTS OF RESISTANCE TRAINING ON FAT AND CARBOHYDRATE OXIDATION IN MALES

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Objectives: The purpose of present study was to investigate the effects of 12 weeks resistance training on fat and carbohydrate metabolism.

Methods: Twenty healthy male subjects were randomly divided into two control (N=10; Mean \pm SD; age, 26.75 ± 2.05 years; BMI, 23.05 ± 2.6 kg/m²; fat%, 12.8 ± 4.6) and experiment (N=10; age, 22.6 ± 3.4 years; BMI, 22.9 ± 2.19 kg/m²; fat%, 14.4 ± 2.9) groups. The Research Centre's ethics committee initially approved the experimental procedures and study protocols, and a written consent form was obtained. After familiarisation sessions, subjects' one repetition maximum (1-RM) for 8 exercises were determined and used to calculate the amount of resistance. Training group performed a resistance-training programme three days a week for 12 weeks, while the control group participated in no resistance training. The resistance exercise protocol included the performance of 3 sets of 10 repetitions of 8 exercises at 55% of 1-RM for the first month and the intensity increased to 65 and 75% of 1-RM for the second and third months. Before and after training period oxygen consumption (VO₂) and carbon dioxide output (VCO₂) were measured breath by breath during an exercise protocol (running on treadmill for 30 minutes). Rates of fat and CHO oxidation were calculated using the equations of Frayn (1993). Within and between subjects effects were determined by using paired and independent t-test.

Results: Data analysis revealed no significant different between two groups for fat oxidation. In addition, when pre- and post-training fat oxidation values were compared no significant effect of training was detected. However, rate of carbohydrate oxidation was significantly ($t=4.3$, $P < 0.01$) different between two groups. Rate of carbohydrate oxidation in response to 12 weeks of training decreased significantly ($P < 0.05$) from 2.19 ± 0.21 to 1.63 ± 0.12 g/min.

Conclusion: It is concluded that resistance training induces significant changes only in rate of carbohydrate oxidation.

GENDER VARIATIONS IN THE EFFECT OF RESISTANCE TRAINING AND VITAMIN C/E SUPPLEMENTATION ON ABDOMINAL FAT MASS IN OLDER ADULTS

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Objective: Aging is associated with fat mass (FM) gains, especially at the abdomen, that could lead to metabolic syndrome and type 2 diabetes. Some studies reported beneficial effects of resistance training (RT) on FM. On the other hand, vitamin C is associated with fat oxidation during exercise. Because these effects are weak separately, it would be interesting to examine

the combined effect of RT and vitamin C supplementation on FM distribution in the elderly. The aim of this study was to measure abdominal FM following RT with and without vitamin C supplementation in older men and women.

Methods: The results of this study are secondary analyses from a larger trial pertaining to the effect of RT combined with vitamin C/E on body composition. Thirty-six healthy men and women, aged 65.8 ± 3.8 yrs, were divided into 2 groups: RT (3x8 repetitions at 80% of 1-RM; 3days/week); RT combined to vitamin supplementation (vitC: 1000mg/d; vitE: 600mg/d). Vitamins C/E were analyzed by HPLC. FM distribution was determined by DXA and visceral FM (VFM) was estimated by Bertin's equation. An independent sample *t*-test was used to determine differences between groups at baseline. Covariables were taken into account when differences at baseline were noted. Moreover, a paired *t*-test was performed to evaluate differences after 6 months.

Results: At baseline, no difference was observed between groups neither for the whole sample nor for women. On the other hand, men presented differences between groups (BMI, waist and VFM). Those were thus taken into account in analyses. After the intervention, the whole sample showed a significant increase in VFM ($P=0.023$). However, the difference was significant only in the combined intervention group ($P=0.045$). Furthermore, we found no gender difference.

Conclusions: A 6 month RT program, with or without vitamin C/E supplementation, in healthy elderly individuals did not decrease significantly abdominal FM. Moreover, we observed a significant increase in VFM following RT and vitamin C/E supplementation. These differences in FM distribution would merit further attention to determine mechanisms of adaptation. This study was supported by CDA.

Abstract topic: Abdominal fat mass, Resistance training, Vitamin supplementation, Elderly.

SCHOOL BASED PHYSICAL ACTIVITY IN PREVENTION OF CHILDHOOD OBESITY - A SYSTEMATIC REVIEW

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Background: The school based physical activity intervention in childhood obesity is poorly understood.

Objective: To assess the effectiveness of school based physical activity interventions in the prevention of obesity in childhood.

Search strategy: Medline, Pubmed Central, clinical trials registry, PeDro, Cochrane central registry were searched from January 2000 until September 2009.

Selection criteria: Data from randomized control trials and non-randomized trials in which effect size is been clearly stated were included. The trials should measure outcome measures of anthropometry, functional and psychological variables. A priori, studies with follow up of 6 months year minimum were selected. The literature intervening physical activity (structured and non -structured) alone and with dietary implementation included.

Data collection & analysis: Two blinded reviewers extracted data and assessed study quality. The omitted trials were once again assessed for its quality to include in analysis by the methodological reviewer. Pooled analysis effect size was calculated after the elimination publication bias and research bias through funnel plots.

Main results: 782 full text articles were retrieved by the blinded assessors. After the methodological appraisal, only 146 trials were included of which 26 were systematic reviews and 6 positional statements. From the 114 trials, 9 were considered to be strong, 18 moderate and remaining 87 weak in methodological and statistical quality. The pooled analysis stated that the school based physical activity along with dietary and behavioral modification impacts in the functional and psychological improvements. The physical activity prevents obesity and related complications in boys more than girls. Among the minimal physical activity implications in the school, the walk to school or biking, avoiding lifts and stairs usage were recommended by many reviews. But the systematic reviews did not find any beneficial effects in childhood obesity with the leisure time activities like gardening. The position statements stated that the sedentary behaviors of TV watching and the skipping of morning meals, fast food consumption were reduced after the school education programs.

Authors' conclusions: There is good evidence that school based physical activity would reduce the childhood obesity and its complication. Hence, well programmed and structured physical activity prescription after individual risk stratification is recommended.

EFFECTS OF CARDIORESPIRATORY FITNESS AND VISCERAL FAT AREA ON METABOLIC SYNDROME IN JAPANESE PATIENTS WITH NEWLY-DIAGNOSED TYPE OF DIABETES MELLITUS

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Objectives: The purpose of this study was to clarify the effects of cardiorespiratory fitness (CRF) and visceral fat area (VFA) on metabolic syndrome (MS) in newly-diagnosed patients with impaired glucose tolerance (IGT) and type 2 diabetes mellitus (T2DM) aged 20-79 years. We cross-sectionally investigated the relative contributions of CRF and VFA on the prevalence of MS in IGT or T2DM ($n=237$). We also investigated combination or singles effects of CRF and/or VFA concerning to improvements of MS in T2DM after one-year exercise and diet intervention ($n=65$).

Methods: Participants did not undergo any intervention and pharmacological therapy before participating in this study. We assessed MS components such as BMI, waist to hip ratio (WHR), resting blood pressure, fasting blood glucose (FPG), triglyceride (TG), high-density lipoprotein cholesterol (HDL-c). CRF characterized by the maximal oxygen uptake was measured by multi-graded exercise test using cycle ergometer. VFA was measured at level of the umbilic by computed tomography scan. MS was determined using BMI-modified WHO criteria ($BMI \geq 25$ kg/m²). Sixty-five subjects participated in the exercise and diet intervention, and were divided into the three groups based on the values of CRF and VFA before and after intervention following; both improved group (as combination effect), improved group either CRF or VFA (as single effects), and not improved group (as control). The criteria according to "improvement" of CRF and VFA was defined as more than 5% change by intervention.

Results: In the cross-sectional studies, CRF and VFA were significantly differed between groups with and without MS in T2DM, but not IGT. The combination effect of CRF and VFA significantly improved on almost all the MS components, namely BMI, HDL-c, TG, and FPG. These single effects of CRF or VFA significantly improved on either WHR or BMI, and HDL-c by the intervention.

Conclusions: CRF and VFA may contribute to the prevalence of MS in the newly-diagnosed patients with T2DM. We suggest that MS components may improve drastically by more than 5% change of bot CRF and VFA in a 1-year diet and exercise intervention program.

EFFECT OF A 1-YEAR LIFESTYLE MODIFICATION PROGRAM ON HEMODYNAMIC PARAMETERS IN SEDENTARY ABDOMINALLY OBESE MEN

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Aims: Studies have shown that individuals with high levels of visceral adipose tissue (VAT) and/or low cardiorespiratory fitness (CRF) have deteriorated hemodynamic parameters such as higher systolic (SBP) and diastolic blood pressure (DBP) as well as higher resting heart rate (RHR) compared to fit and lean individuals. We hypothesized that a 1-year lifestyle modification program would have favorable effect on hemodynamic parameters in sedentary abdominally obese men with an atherogenic dyslipidemia.

Methods: A total of 93 men (mean age: 47.8±8.5 years, mean body mass index: 31.1±3.1 kg/m²) underwent a 1-year lifestyle modification program aiming at increasing physical activity levels and improving dietary habits. The objective of the intervention was to promote 5-10% body weight loss by decreasing the daily energy intake by approximately 500 kcal. VAT was measured by computed tomography and CRF levels were obtained by a submaximal physical working capacity test at baseline and at follow-up.

Results: At baseline, mean SBP was 116±11 mmHg, mean DBP was 78±7 mmHg and mean RHR was 69±8bpm. Compared to baseline values, mean changes were -2.1 mmHg for SBP (p=0.03), -4.5 mmHg for DBP (p<0.001) and -5.5 bpm for RHR (p<0.001). One year changes in VAT were associated with changes in CRF (r=-0.56, p<0.001). Changes in SBP were associated with changes in CRF (r=-0.23, p=0.03) but not with changes in VAT. Changes in DBP were associated with changes in CRF (r=-0.26, p=0.01) as well as with changes in VAT (r=0.26, p=0.01). Changes in RHR were associated with changes in VAT (r=0.29, p=0.005) but not with changes in CRF.

Conclusions: Our results suggest that a 1-year lifestyle modification program had favorable effect on hemodynamic parameters in sedentary and abdominally obese men. Targeting both cardiorespiratory fitness and visceral adiposity are both important for the optimal management of hemodynamic parameters of abdominally obese men with an atherogenic dyslipidemia.

ABDOMINAL FAT LOSS FOLLOWING 15 WEEKS OF HIGH INTENSITY, INTERMITTENT CYCLE ERGOMETER TRAINING

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Aims: This study examined the effects of three bouts per week of HIIE on abdominal and truncal fat loss in sedentary young women.

Methods: 45 females (19-26 years) underwent pre- and post-training testing including a VO₂max test and DEXA. DEXA provides both trunk and central abdominal measures. The trunk measurement includes the area distal to the neck and superior to the pelvis without the upper limbs. The mean fat mass (FM) in this area was 10.3 kg with a lean mass of 18.4 kg. The central abdominal measurement covered a section between T12 and L4 and had a typical FM of 1.2 kg and lean mass of 2.5 kg. Subjects were randomly assigned to HIIE, SS, or control groups. Subjects exercised for 15 weeks under supervision. The HIIE group did 20 min of exercise (8 s sprint, 12 s recovery), whereas SS exercised at 60% VO₂max for 40 min. The exercise energy expenditure was not different between groups. Dietary intake was regularly monitored through food diaries and did not change significantly.

Results: Mean change for the HIIE group was: central abdominal fat -0.15 ± 0.07 kg and trunk fat -1.4 ± 0.17 kg (p<0.05). In the HIIE group percent fat in the central abdominal region decreased from 32.1 ± 3.3% to 30.2 ± 3.4% and trunk fat decreased from 36.5 ± 3.4% to 33.2 ± 2.9% (p<0.05). The SS group had a non-significant increase in central abdominal fat of 0.1 ± 0.08 kg and trunk fat 0.11 ± 0.51 kg. In this group percent fat in the central abdominal region increased from 23.6 ± 3.8% to 26.5 ± 3.5% and trunk fat increased from 30.9 ± 3.7% to 31.8 ± 3.6%. There was no change in the control group. The subjects who lost the most central abdominal fat had the largest decrease in fasting insulin (r=0.46, p<0.05).

Conclusions: Twenty minutes of HIIE, three times a week for 15 weeks resulted in significantly greater abdominal and truncal fat loss compared to SS exercise. Decreases in fasting insulin level related to decreases in abdominal fat.

EFFECT OF THREE DIFFERENT PHYSICAL EXERCISE MODALITIES ON VISCERAL ADIPOSITY IN WOMEN WITH METABOLIC SYNDROME

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Background: Metabolic syndrome (MS) increases the risk of developing type 2 diabetes (DM2) and cardiovascular disease (CVD). In women, MS increases CVD risk five times more than in men. Evidence has shown that lifestyle modification programs aiming at weight reduction and increased physical activity reduced the risk of DM2. However, little is known about the effects of different physical exercise modalities (PEM) in women with MS.

Objective: To evaluate prospectively the impact of 3 different PEM in women with MS.

Methods: We studied prospectively during 6 month a sample of 43 women with MS (according to AHA 2005 criteria). Women were randomized to 3 exercise modality groups: aerobic, resistance training and flexibility. The training volume was increased progressively to achieve almost 1 hour/session, 5 times per week.

Results: Subjects mean baseline characteristics were: age 54.7 ± 8.4 years, SBP 136.5 ± 17.5 , DBP 85.2 ± 9.7 mmHg, weight 76.4 ± 9.6 Kg, waist circumference (WC) 99.9 ± 8.5 cm. No differences were observed between groups at baseline. Comparing pre- versus post- values, only waist circumferences showed a statistically significant reduction (99.9 ± 8.5 vs 97.6 ± 8.1 cm $p=0.018$). In the by group analysis, a significant reduction in waist was only observed in the aerobic exercise arm (96.8 ± 8.1 vs 94.6 ± 8 cm $p=0.031$).

Conclusion: Our study shows that aerobic exercise is more useful than resistance training or flexibility exercises to reduce visceral adiposity estimated by WC in women with the MS. Biomarkers and imaging measurements of visceral adiposity are currently analyzed.

Prevention

CYTOPROTECTIVE EFFECT OF KIOM-4 AGAINST MITOCHONDRIAL DAMAGE OF PANCREATIC B-CELLS INDUCED BY STREPTOZOTOCIN VIA ANTIOXIDANT EFFECTS

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The protective effect of KIOM-4, a mixture of plant extracts, was examined against mitochondrial oxidative stress by streptozotocin (STZ) in rat pancreatic b-cells (RINm5F). KIOM-4 scavenged the superoxide and hydroxyl radicals generated by xanthin/xanthin oxidase and Fenton reaction ($\text{FeSO}_4/\text{H}_2\text{O}_2$), respectively, in a cell-free chemical system. In addition, a marked increase in mitochondrial reactive oxygen species (ROS) was observed in STZ induced diabetic cells, and KIOM-4 recovered. Mitochondrial manganese superoxide dismutase (Mn SOD) activity and its protein expression were down-regulated by STZ treatment and were up-regulated by KIOM-4 treatment. Additionally, NF-E2 related factor 2 (Nrf2), a transcription factor of Mn SOD, was similarly up-regulated by KIOM-4. KIOM-4 prevented the STZ-induced mitochondrial lipid peroxidation, protein carbonyl, and DNA modification. Moreover, KIOM-4 treatment restored the loss of the mitochondrial membrane potential ($\Delta\psi$) which have been induced by STZ treatment, and inhibited the translocation of cytochrome c from the mitochondria to the cytosol. In addition, KIOM-4 treatment elevated ATP level and succinate dehydrogenase activity, which was reduced by STZ treatment. These results suggest that KIOM-4 exhibits a protective effect through the increased antioxidant effect and through the attenuation of mitochondrial dysfunction in STZ-induced diabetic cells.

THE EFFECT OF OBESITY PREVENTION PROGRAM IN CHILDREN

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Objectives: To examine the effects on preventing obesity of an obesity intervention program among elementary school children.

Methods: A nonrandomized school-based intervention program was conducted over six months. A total of 764 children at five elementary schools in two cities, Gyeonggi Province, Korea were selected for this study. Anthropometric data, lifestyles and familial environment based on self-administered questionnaires were assessed at baseline and six months later. The intervention had three components: nutritional education, physical education, and education of parents. The subjects were divided into the parent-child intervention group (n=397) and the parent-only intervention group (n=347).

Results: About 15.6% of examined schoolchildren were overweight and 12.7% were obesity. After the six-month intervention program, the proportion of obese group defined as over 85th percentile of sex-age specific body mass index showed a significant reduction in both groups (the parent-child intervention group: 30.2% \rightarrow 26.7%, $P = 0.01$; the parent-only intervention group: 26.2% \rightarrow 22.1%, $P = 0.01$). This change was significant among girls (the parent-child intervention group: 31.6% \rightarrow 25.0%, $P = 0.001$; the parent-only intervention group: 29.7% \rightarrow 22.5%, $P = 0.007$). At the end of the six-month intervention program, factors that influenced the obesity of children included working mothers (OR 1.62, 95%CI 1.20-2.19) and the high BMI of their parents (fathers: OR 1.07, 95%CI 1.01-1.15; mothers: OR 1.20, 95%CI 1.139-1.27). The parent-child intervention program had greater effects on the improvement of nutritional knowledge scores and the reduction of the risk of metabolic derangement than the parent-only intervention program. However, no significant difference was observed between the two groups in changes in anthropometric measurements such as the BMI and percent body fat.

Conclusions: In devising an intervention program aimed at preventing obesity, special attention should be paid to children of obese parents and working mothers. An education program targeting both parents and children is more effective than that targeting only parents in improving the level of knowledge on nutrition and reducing the risk factors of metabolic derangement.

PROTECTIVE EFFECT OF B-CATECHIN ON STREPTOZOTOCIN INDUCED MITOCHONDRIAL DAMAGE VIA ANTIOXIDANT EFFECTS IN PANCREATIC B-CELLS

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The protective effect of β -catechin consisting of green tea and sunflower seed extract, as well as ascorbic acid, was examined against mitochondrial oxidative stress by streptozotocin (STZ) in rat pancreatic β -cells (RINm5F). β -catechin scavenged the superoxide and hydroxyl radicals generated by

xanthin/xanthin oxidase and Fenton reaction ($\text{FeSO}_4/\text{H}_2\text{O}_2$), respectively, in a cell-free chemical system. In addition, a marked increase in mitochondrial reactive oxygen species (ROS) was observed in STZ induced diabetic cells, and β -catechin recovered. Mitochondrial manganese superoxide dismutase (Mn SOD) activity and its protein expression were down-regulated by STZ treatment and were up-regulated by β -catechin treatment. Additionally, NF-E2 related factor 2 (Nrf2), a transcription factor of Mn SOD, was similarly up-regulated by β -catechin. β -catechin prevented the STZ-induced mitochondrial lipid peroxidation, protein carbonyl, and DNA modification. Moreover, β -catechin treatment restored the loss of the mitochondrial membrane potential which have been induced by STZ treatment, and inhibited the translocation of cytochrome c from the mitochondria to the cytosol. In addition, β -catechin treatment elevated ATP level and succinate dehydrogenase activity, which was reduced by STZ treatment. These results suggest that β -catechin exhibits a protective effect through the increased antioxidant effect and through the attenuation of mitochondrial dysfunction in STZ-induced diabetic cells.

A REVIEW OF ABNORMAL EATING BEHAVIOUR IN PRADER WILLI SYNDROME AND THE USE OF BEHAVIOURAL INTERVENTION AND ENVIRONMENTAL MODIFICATION

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A review of cases with Prada Willi Syndrome attending an outpatient developmental disability clinic in suburban Sydney Australia from 2004 to 2009. A literature search and review of the genetic predisposition to the abnormal eating disorders of this population was undertaken. Efforts in modifying the shopping habits of the carers and involvement of dietitian and psychologist in devising a behavioural modification programme is examined for effectiveness. Outcome was determined by the progression of weight gain and on quantitative analysis of eating behaviour will be discussed. Annual blood test was analysed for nutritional indices. The implementation of physical activity and exercise routine as part of management will also be discussed.

KIOM-79, A COMBINATION OF PLANT EXTRACTS, PROTECTED AGAINST MITOCHONDRIAL DAMAGE INDUCED BY STREPTOZOTOCIN IN PANCREATIC BETA-CELLS

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The present study examined the effect of KIOM-79 on streptozotocin (STZ)-induced mitochondrial oxidative stress in rat pancreatic beta-cells (RINm5F). KIOM-79 is a mixture of plant extracts from parched *Puerariae radix*, gingered *Magnoliae cortex*, *Glycyrrhizae radix*, and *Euphorbiae radix*. A marked increase in mitochondrial reactive oxygen species (ROS) was observed in STZ induced diabetic cells, and it was returned to normal level on KIOM-79 treatment. Mitochondrial manganese superoxide dismutase (Mn SOD) activity and its protein expression were down-regulated by STZ treatment and

alternatively, were up-regulated by KIOM-79 treatment. Additionally, KIOM-79 treatment restored the loss of the mitochondrial membrane potential which have been induced by STZ treatment, and induced an increase in Bcl-2, the decrease of phospho Bcl-2 and Bax, which are related to permeability of the mitochondrial membrane, and inhibited the translocation of cytochrome c from the mitochondria to the cytosol. Moreover, KIOM-79 treatment elevated ATP level, which was reduced by STZ treatment. These results suggest that KIOM-79 exhibits a protective effect through the activation of antioxidant defense mechanisms and by the attenuation of mitochondrial dysfunction in STZ-induced diabetic cells.

Smoking

SMOKING IS ASSOCIATED WITH ABDOMINAL OBESITY IN KOREAN MEN: KOREA MEDICAL INSTITUTE STUDY

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Objective: Abdominal obesity increases mortality and morbidity of cardiovascular disease and there is some possibility that smoking has effect on obesity. The objective of this study was to examine whether smoking is positively related with abdominal obesity in the Korean men.

Methods: This study was carried out on 68,299 men who visited the Health Promotion Center in Korea Medical Institute from 2007 to 2008. The subjects were checked on age, height, weight, blood pressure, lifestyle (cigarette smoking habits, alcohol drinking, exercise, etc.), and waist circumference. Smoking status was categorized into nonsmokers, current smokers, and ex-smokers. The amount and duration of smoking were also obtained. Abdominal obesity was defined as the waist circumference of $\geq 90\text{cm}$.

Results: Statistically significant differences in waist circumference by smoking status were found. The mean of waist circumference was significantly high in heavy smokers and low in mild smokers. Waist circumference was significantly increased according to the smoking status after adjustment for body mass index, age, alcohol intake, and exercise. As compared to non smokers, the Odds ratio (OR) and 95% CI for abdominal obesity in ex-smokers and current smokers were 1.09 (1.02 - 1.17) and 1.29 (1.21 - 1.37), respectively. There was a positive association between waist circumference and smoking exposure in both the normal weight group ($\text{BMI} < 25$) and overweight group ($\text{BMI} \geq 25$). In addition, we observed a linear increase in the OR of abdominal obesity with increasing levels of both smoking amount and smoking duration.

Conclusion: Smoking exposure was positively associated with abdominal obesity. The results of the present study do support the hypothesis that smoking affects an abnormal fat distribution profile predominantly in the form of abdominal obesity as reported earlier.

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