Obesity, metabolic syndrome

W338

SERUM URIC ACID AND GAMMA-GLUTAMYLTRANSFERASE LEVELS BETTER PREDICT OVERWEIGHT OR OBESE PEOPLE WITH THE METABOLIC SYNDROME

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BACKGROUND-AIM

The role of uric acid, aspartate aminotransferase, alanine-aminotransferase, gamma-glutamyltransferase and alkaline phosphatase has not been well studied in obese, middle-aged, and elderly people.

METHODS

We enrolled 117 consecutive overweight or obese patients, who visited our hospital for their annual check-up, and measured their aspartate aminotransferase, alanine aminotransferase, gamma-glutamyltransferase, alkaline phosphatase, and serum uric acid levels.

RESULTS

82 patients (70% of the participants) had the metabolic syndrome. Patients with the metabolic syndrome had considerably increased serum uric acid, alanine aminotransferase, and gamma-glutamyltransferase levels. Moreover, serum uric acid, alanine aminotransferase, and gamma-glutamyltransferase levels increased as the number of components of the metabolic syndrome increased. Multi-adjusted logistic regression analysis revealed that 1 unit increase in ALP was associated with 2% higher likelihood of having the metabolic syndrome (95% CI: 1%–4%), and 1 unit increase in uric acid was associated with 30% higher likelihood of having the metabolic syndrome (95% CI: 0%–75%), after adjusting for age, sex, smoking habits, and physical activity status of the participants.

CONCLUSION

These biochemical markers could help identify patients with the metabolic syndrome, who are at increased risk for future cardiovascular events. In this study, serum uric acid correlated best with GGT. It seems likely that GGT together with serum uric acid are strong
predictors of the metabolic syndrome. The notion that increased levels of GGT and serum uric acid could help predict patients at increased risk for future cardiovascular events, deserves further scientific documentation.

Obesity, metabolic syndrome

W339

DETERMINATION OF LEPTIN IN OBESE AND NON-OBESE

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BACKGROUND-AIM

Leptin has been associated with problems of obesity and metabolic disorders such as insulin resistance, so the objective of this research was to evaluate the concentration of leptin in obese and non-obese mexican patients.

METHODS

Cross-sectional study was performed in subjects with normal weight (BMI <25) and overweight or obese (BMI> 25). Leptin was determined by ELISA, (All measurements were calibrated and performed in duplicate) blood sample was obtained in vacuum tube from overnight 10 hours fasting. Measures of central tendency, Pearson Correlation Coefficient and Student t test were calculated.

RESULTS

75 volunteer subjects were evaluated, whose mean age was 19.65 age (± 1.27) of which 45% were males and 55% females. The median leptin concentration was 16.98 ng/dL, BMI 24.65 (± 4.81), waist-hip ratio (WHR) 0.829 (±0.093). 37% of the subjects were overweight or obese with a BMI average of 29.29 (± 4.61), WHR 0.92 (± 0.079) males and WHR 0.90 (± 0.10) female and leptin concentrations of 25.74 ng/dL (± 21.15). In non-obese subjects (63%) the BMI was 21.85 (± 1.99) and the concentration of leptin 16.41ng/dL (± 9.67) (p=0.049). Regarding family history, 32% had a parent with obesity, 19% diabetes and 25% with high blood pressure (HBP); furthermore, 52% had a grandparent with diabetes, 39% HBP and 23% with obesity. Regard personal history, one subject had HBP, 5.3% hypercholesterolemia, one high glucose levels, and 5.3% a cardiovascular problem. In the study sample leptin concentration was significantly correlated with BMI (r=0.440, p=0.0001), WHR (r=0.422, p=0.0002). In female patients, leptin was positively correlated with BMI (r=0.327, p = 0.025), but no correlation was observed with the WHR. In men, the correlation between leptin and BMI was (r=0.456, p=0.015), WHR (r=-0587, p= 0.001).

CONCLUSION

We found that Leptin concentration is above the limits reported in the insert. In our sample, Leptin had significant correlation with gender, BMI y obesity.

Obesity, metabolic syndrome

W340

PROGNOSTIC SIGNIFICANCE LABORATORY MARKERS FOR THE POSSIBILITY OF REDUCING BODY WEIGHT

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BACKGROUND-AIM

The purpose of this work was to evaluate the prognostic significance of hormonal activity of adipose tissue, the condition of carbohydrate and lipid metabolism, inflammatory activity and anthropometric indicators in the assessment of the possibility of reducing body weight in obese patients with weight loss treatment.

METHODS

A total of 110 patients were tested (25 males and 85 females) obese (BMI 30 kg/m2) aged 38-75 years. To evaluate the anthropometric data was measured weight, height, waist circumference and hip circumference, was calculated body mass index (BMI) and the ratio of the waist circumference to the hip circumference (WC/HC). The level of blood pressure was measured. For Integrated Assessment of carbohydrate metabolism was evaluated glucose concentration, the percentage of glycated hemoglobin (HbA1c) and insulin content. Condition lipid transport system was evaluated by the concentration of total cholesterol, triglycerides, lipoproteins cholesterol high and low density. Hormonal activity of adipose tissue was evaluated by levels of adiponectin and leptin.
In order to reduce body weight for all patients was appointed hypocaloric diet for 6 months. After the treatment the test was repeated.

RESULTS

The data indicate that the reduction in caloric intake gives to increased concentrations of adiponectin.
Based on the figures in the original survey, was built by the simulated neural net, the task of which was to study the processing of data and predict the possible outcome of treatment. The neural net has allowed calculating and building the ROC-curve. With the help of this model it give evaluate the possibility of reducing the weight by more than 5% of the original value with a probability of 87%. In this model the greatest prognostic value are adiponectin and BMI×WC/HC with using all of the studied parameters.

CONCLUSION

Thus it can recommend the introduction of determining the adiponectin concentration to the list for survey of obesity patients in the treatment appointment.

Obesity, metabolic syndrome

W341

DIFFERENCES OF LEPTIN LEVELS WHEN OBESITY IS COMBINED WITH PICKWICK SYNDROME

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BACKGROUND-AIM

Resistance to leptin is a common place between obese (BMI>30) people. A certain percentage of these people also suffer from sleep-apnoea syndrome. Our goal was to determine whether the co-existence of Pickwick syndrome and obesity rises the serum leptin levels compared to serum levels of leptin when obesity is not accompanied with Pickwick's.

METHODS

We assessed serum leptin levels of 30 obese-Pickwick patients (group A) and 30 obese patients without Pickwick's (group B).
Leptin levels were determined via ELISA and Pickwick's was diagnosed or not, using a polysomnogram
.

RESULTS

In group A, the mean value of leptin was 47,12+/-5,2 mg/ml and in group B the mean value of leptin was 27,23+/-3,4mg/ml.
The SPSS statistical analysis of the results demonstrated a strong correlation (p<0,001) between the serum leptin levels and the presence of Pickwick's, since in group A leptin was statistically much higher compared to leptin levels of group B.

CONCLUSION

This study suggests that serum leptin is not only a strong marker of obesity and perturbed lipid metabolism but a possible indicator of the co-existence of Pickwick's syndrome. This way, a simple lab result may lead a patient to a further examination with the polysomnogram, offering the chance for a great improvement to his or hers life quality.

Obesity, metabolic syndrome

W342

IMPACT OF CCR2 VAL64ILE GENE POLYMORPHISM ON MRNA EXPRESSION OF THE 64VAL AND 64ILE ALLELES. ITS ASSOCIATION WITH ADIPOSITY AND IMMUNEMETABOLIC MARKERS IN A MEXICAN-MESTIZO POPULATION

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BACKGROUND-AIM

Infiltration of monocytes/macrophages in adipose tissue promotes the subclinical low-grade inflammatory status seen in obesity. Adipocytes secretes MCP-1, potent monocytes chemotactic and principal ligand of CCR2 receptor. Studies have reported VAL64ILE polymorphism in CCR2 where is a substitution of valine for isoleucine in the transmembrane portion of the receptor with unknown physiological effects. AIM: To determine gene expression of CCR2 and its association with adiposity and immunemetabolic markers level in individuals with 64VAL or 64ILE alleles.

METHODS

Cross-sectional study with internal comparison group that included 254 Mexican-mestizos classified by adiposity by Deurenberg`s obesity criteria, who underwent genotyping (allele specific PCR) and were classified by phenotypes to determine gene expression of CCR2 by quantitative polymerase chain reaction. Immunemetabolic profile was measured by routine methods.
This work was supported by grant No220214. PROMEP 2014-2015. Fortalecimiento de UDG-CA-701.

RESULTS

Individuals VAL/VAL genotype carriers showed increase in body fat mass (32.0 ±12.7 vs 27.0 ±8.7 kg, P=0.040) vs VAL/ILE genotype carriers. While individuals without obesity, VAL+ phenotype carriers, have less subcutaneous area, compared with VAL– phenotype carriers (386 ±157 vs 437 ±9.89 cm^2, P=0.033). In contrast, obese individuals VAL- phenotype carriers, have higher triglyceride levels (168 ±79 vs 101 ±30 mg/dL), VLDLc (33.7 ±15.9 vs 20.0 ±6.1 mg/dL) and TG/HDLc (4.4 ±2.4 vs 2.4 ±0.6), P <0.05, than VAL+ phenotype carriers.
On the other hand, we observed that individuals ILE+ phenotype carriers, have higher adiposity, with increase of:
a) Body weight (82.8 ±20.2 vs 76.5 ±15.7 kg, P=0.038),
b) Percentage of fat mass (12.9 ±37.9 vs 34. ±6.3%, P=0.013),
c) Hip circumference (110.8±12.2 vs. 106.2±10.1 cm, P=0.017), and
d) Body fat index (11.97 ±4.45 vs 10.50 ±3.21, P=0.023),
than individuals ILE- phenotype carriers.
Interestingly, those obese individuals ILE+ phenotype carriers showed decrease in CCR2 expression levels, total leukocytes and platelets but mostly in protein C reactive levels vs ILE- (2.65 ±3.32 vs 1.29 ±1.49 mg/L, P=0.024).

CONCLUSION

Individuals ILE+ phenotype carriers present a decreased CCR2 gene expression, less adiposity and favorable immunemetabolic profile.

Obesity, metabolic syndrome

W343

PLASMA LIPIDS, LIPOPROTEINS, LIPOPROTEIN (A) AND HIGH SENSITIVE C REACTIVE PROTEIN IN OVERWEIGHT AND OBESE SUBJECTS ON REGULATED EXERCISE

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BACKGROUND-AIM

Recent evidence has linked exercise to elicit changes in plasma lipids, lipoproteins, lipoprotein (a) (Lp(a)) and high sensitive C reactive protein (hsCRP) consistent with reduced risk for premature cardiovascular disease (CVD) and other metabolic syndrome.
This study was designed to determine the influence of regulated exercise on plasma lipids, lipoproteins, Lp(a), hsCRP and the anthropometric indices in the obese and overweight subjects using treadmill.

METHODS

Forty (40) overweight and obese individuals who were not diagnosed for any diseases, consisting of men (n=20) and women (n=20) with mean age 35.25 ± 6.05 years, participated in 12 weeks of regulated exercise for a minimum of 2hours, 3 sessions per week using land based treadmill. Subjects served as self controls. Serum Lp(a), hsCRP, plasma lipids, lipoproteins and anthropometric indices were determined before and after regulated exercise using standard biochemical procedures.

RESULTS

The results showed significant decreases in body weight, body mass index, %body fat (BF) waist circumference, waist-hip ratio (WHR), plasma total cholesterol (TC), triglycerides, low density lipoprotein cholesterol(LDLC) and TC/high density lipoprotein cholesterol(HDLC) ratio ($p < 0.000$) when compared with the corresponding values before exercise. There were also significant increases in plasma HDLC and serum hsCRP ($p < 0.000$) compared with the corresponding baseline values. Although, the mean serum Lp(a) level was reduced in all subjects after regulated exercise, the decreased was not statistically significant.

CONCLUSION

The main findings of the present study were significant decreases in anthropometric indices, plasma TC, triglycerides, LDLC, TC/HDLC ratio and significant increases in plasma HDLC and serum hsCRP. These findings provide supportive evidence that regulatory exercise elicit therapeutic benefits consistent with reduced risk for premature CVD.

Obesity, metabolic syndrome

W344

MOROCCAN STUDY AMONG OBESE PATIENTS WITH OR WITHOUT METABOLIC SYNDROME: NUTRITIONAL SURVEY AND BIOLOGICAL PARAMETERS

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BACKGROUND-AIM

Mediterranean diet reflects a typical culture and lifestyle proper to the Mediterranean basin. However, Morocco has met an important nutritional transition for last years. To better become aware of these changes, we realized a dietary survey in obese Moroccan patients with or without metabolic syndrome (MS).

METHODS

We recruited 241 obese patients, mean-aged of 53.97± 10.50 years-old, and divided them into two groups: without MS (Ob without MS, n= 29 men and 92 women) and with MS (Ob with MS, n= 29 men and 91 women), matched for sex and age. MS has been defined in accordance with NCEP-ATP III criteria. We also assessed the relationship between lipid parameters, low grade inflammation and MS.

RESULTS

Ob with MS's diet was more caloric but poorer in polyunsaturated fatty acids (PUFA), in vitamins B9 and E. Both groups consume meals which macronutrient compositions were similar. The consumption of Retinol, Beta-carotene, Vitamin C and trace elements was higher in Ob with MS than in those without MS, whereas consumption of cholesterol and fibers were not significantly different.
In patients with MetS, lipoprotein profiles alterations and low grade inflammation were observed. Lipid ratios were better predictors of cardiovascular risk than lipids alone because of their relative associations with lipoproteins and apolipoproteins.

CONCLUSION

The present study showed that Moroccans have a rich diet, but poor in vitamins and trace elements, the overall translating a little knowledge of foods and theirs nutritional benefits.

Obesity, metabolic syndrome

W345

DECREASED CIRCULATORY MATRIX METALLOPROTEINASE-1 IN PATIENTS WITH METABOLIC SYNDROME

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BACKGROUND-AIM

The metabolic syndrome abnormalities are implicated in the changes of extracellular matrix (ECM) via the metalloproteinase (MMP) and their inhibitors (TIMP). The aim of this study was to assay the metalloproteinase-1 (MMP-1) and tissue inhibitors, TIMP-1 and TIMP-2 in patients with metabolic syndrome (MS).

METHODS

199 patients with MS and 150 control subjects were required in the hospital of Rabta. MMP-1, TIMP-1 and TIMP-2 levels were determined in citrate plasma by ELISA methods.

RESULTS

The levels of MMP-1 decreased significantly in MS patients compared with control group ($p< 0.001$) in contrast with TIMP-1whichwas significantly higher in MS patients compared to control group (40.53 ng/ml vs 29.04 ng/ml, $p < 0.001$). TIMP-2 levels did not present any significant variation in both groups. A significant decrease in the level of MMP-1 and the MMP-1/TIMP-1 ratio was found according to the number of components of the MS. Conversely, the TIMP-1 levels increased significantly in the number of these components.

CONCLUSION

The decrease of the MMP-1 is associated with a significant increase of its specific inhibitor. These results demonstrate the disruption of the balance between MMP and inhibitors and a matrix remodeling that may explain the pathophysiological changes in MS.

Obesity, metabolic syndrome

W346

LEPTIN LEVELS IN RATS AFTER APPLICATION OF A HIGH-FAT-CARBOHYDRATE DIET FOR 16 WEEKS

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BACKGROUND-AIM

Background: The main factors associated with the metabolic syndrome include improper diet, reduced physical activity, insulin resistance, diabetes mellitus type 2 and obesity. Combined high-fat-carbohydrate diets for the inducement of these diseases in rats imitate successfully the pathology in humans. The aim of the study was to investigate the changes of leptin levels in rats subjected to two different high-fat-carbohydrate diets for 16 weeks.

METHODS

Methods: The duration of experiment I was 16 weeks. Male Wistar rets (n = 20) were divided into two groups: a control group received standard rat chow (K1, n = 10), and a dietary manipulated group which had free access to a combined high-fat-carbohydrate food (HFCD) without additional cholesterol (D1, n = 10). The duration of experiment II was also 16 weeks. Male Wistar rets (n = 80) were divided into two groups: a control group which received standard rat chow (K2, n = 20), and a dietary manipulated group which received combined high-fat-sucrose food (HFSD) with additional cholesterol (D2, n = 60). Twelve weeks after the beginning of the study we found that 13.3 % (n = 8) of the rats from group D2 had low body mass and were considered a dietary resistant group (group DR).
Mix blood was collected 12 hours after the last intake of food for laboratory analysis. The serum levels of fasting leptin were analyzed by the sandwich ELISA method with a Sirio microplate reader (SEAC, Italy) using mouse/rat leptin ELISA kit (Bio Vendor, EU).
The results are represented as X±SEM. The data of the experiments were analyzed with one-way ANOVA.

RESULTS

Results: There was not a difference between the leptin levels of D1 and K1 (53.90±17.70 vs. 70.34±22.15 pg/ml, $P > 0.05$). The application of HFSD with additional cholesterol resulted in increased leptin levels of D2 as compared with the K2 (173.76±71.04 vs. 27.63±1.56 pg/ml, $P < 0.05$). The leptin level in dietary resistant group (56.42±11.08 pg/ml) was higher as compared to the K2 and lower as compared to D2 , but the mean difference did not reach statistical significance (K2/DR and D2/DR, $P > 0.05$).

CONCLUSION

Conclusions: The application of HFCD without additional cholesterol did not change the leptin levels. The application of HFSD with additional cholesterol causes an increase of leptin levels only of rats which have become obese.

Obesity, metabolic syndrome

W347

COMPARATIVE EVALUATION OF THE EFFECTS OF YOGA AND EXERCISE IN PERIMENOPAUSAL WOMEN WITH METABOLIC SYNDROME

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BACKGROUND-AIM

Metabolic syndrome is associated mainly with cardiovascular diseases and type 2 diabetes, and is a growing problem worldwide. People with metabolic syndrome are about twice as likely to develop these disorders compared to subjects without metabolic syndrome. Regular physical activity either yoga or exercise is one of the most important modes of mitigating the effects of risk factors of metabolic syndrome. The purpose of this study was to analyze the effects of yoga and exercise on the anthropometric and cardiovascular indices of metabolic syndrome in perimenopausal women.

METHODS

Sixty four women aged 48.34 ± 4.63 years with perimenopausal symptoms were randomly assigned to either a yoga group (n = 30) or to an exercise group (n = 34) considering inclusion and exclusion criteria set for the study. The participants were checked for anthropometric parameters, glycemic index and serum lipid profile measurements before and after 12-weeks of yoga or exercise intervention

RESULTS

Body weight and body mass index had significantly decreased ($P<0.001$) in yoga group. Waist and hip circumference was significantly decreased ($P<0.001$) in both yoga and exercise group. High-density lipoprotein cholesterol had significantly increased ($P<0.05$) in yoga group. Total cholesterol, triglyceride, low-density lipoprotein cholesterol and Glycated Hb had significantly decreased ($P<0.05$) in both yoga and exercise group. Systolic blood pressure in the yoga group and diastolic blood pressure in both the groups was significantly decreased ($P<0.05$) after the intervention.

CONCLUSION

The findings indicate that yoga and exercise have significant health benefits in perimenopausal women. Consequently it can be effectively used in reducing the risk of cardiovascular disease and type 2 diabetes in perimenopausal women.

Obesity, metabolic syndrome

W348

HEPCIDIN LEVELS IN PATIENTS WITH METABOLIC SYNDROM

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BACKGROUND-AIM

In 1997, Moirand et al. first reported the presence of histologically proven liver iron overload in overweight subjects with abnormal glucose metabolism and dyslipidemia. Nevertheless, the complex pathophysiological links between iron and metabolic derangements remain poorly understood. In the last ten years, hepcidin has emerged as the key iron-regulatory hormone. It is a 25-amino-acid peptide predominantly synthesized in the liver. Hepatic secretion of hepcidin in response to iron overload negatively regulates iron homeostasis. Hepcidin prevents iron efflux from enterocytes, macrophages and hepatocytes into the plasma by inducing internalization and degradation of the iron exporter ferroportin in these cells.
The aim of this study is to analyze the hepcidin in patients with metabolic syndrom in R. Macedonia. This is the first time to detect the concentration of hepcidin in R. Macedonia.

METHODS

The study included 240 subjects - 60 males are with MS and 60 males as control group. 60 females are with MS and 60 females as control group. Individuals aged 18 years or older were eligible to participate in the study.
A written informed consent was obtained for all the subjects included in the study. All subjects filled out a questionnaire about the family history, physical activity and alcohol consumption. Subjects had light indoor clothes and were barefooted during the measurement of their height and weight. The blood samples were taken after overnight fast (12 hours). Hepcidin was determined by ELISA kit (DRG Hepcidin-25 bioactive ELISA, Marburg).

RESULTS

All 240 participants were divided in 4 groups: males control group, females control group, males with MS, females with MS.
The concentration of hepcidin in males control group was ranged from 3 to 36 (mean 12,337 ± 7,37) and in females control group was ranged from 1,235 to 14,748 (mean 6,163± 3,202). The concentration of hepcidin in males with MS was ranged from 2,474 to 85,98 (mean 25,54 ± 18,33) and in females with MS was ranged from 2,933 to 24,055 (mean 11,228± 5,302). Statistical analysis showed that males and females with MS had statistically higher hepcidin levels than control group.

CONCLUSION

The concentration of hepcidin was higher in males and females with MS compared to the control groups.
This study confirms that iron homeostasis is in correlation with the occurrence of metabolic syndrome.

Obesity, metabolic syndrome

W349

WAIST CIRCUMFERENCE AND INSULIN RESISTANCE IN HEROIN DEPENDENCE

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BACKGROUND-AIM

Heroin dependence is associated with metabolic disturbances which may cause impaired carbohydrate homeostasis. Significant correlation was detected between waist circumference and glucose-insulin homeostasis in general population. The aim of the study is to analyze the correlation between waist circumference in heroin addicts with referent BMI and index of insulin resistance HOMA-IR.

METHODS

Insulin is a solid-phase, enzyme-labeled chemiluminescent immunometric assay.The solid phase is coated with monoclonal murine anti-insulin antibody. The liquid phase consists of alkaline phosphatase conjugated to polyclonal sheep anti-insulin antibody and alkaline phosphatase conjugated to monoclonal murine anti-insulin antibody. C-peptid levels were determinate with chemiluminescent enzyme immunoassay CLIA methods of Immulite 2000 analyzers.

RESULTS

The prospective study included 160 HCV seronaive heroin dependents with referent BMI (21,5 ± 1,8 kg/m^2), mean age 28,2 ± 5,8 years and predominantly males (88,2% vs. 11,8%).
The mean patients' waist circumference (WC) was (89,4 ± 4,8 cm). Serum glucose (g), insulin (I) and C-peptide values were obtained after night fasting. Insulin resistance was calculated using HOMA-IR. Mean values of glucose were (5,2±0.8 mmol/l), Insulin (8.04 ± 7.9 μIU/ml) and C-peptide (1.8 ± 1.2 ng/ml). Waist circumference showed significant positive correlation with glucose (ρ = 0,176, p<0,05) and with Insulin (ρ=0,239, p<0,05), and HOMA-IR (ρ=0,219, p=0,001), but not to C-peptide (ρ=0,137, p>0, 05).

CONCLUSION

Heroin dependence is associated with significant correlation of WC with serum Glucose Insulin and HOMA-IR. This carbohydrate disturbance in heroin dependence may present a preconditioning for developing of Diabetes mellitus in this population group.

Obesity, metabolic syndrome

W350

PREVALENCE AND ASSOCIATED RISK FACTORS OF OBESITY AMONG SENIOR STAFF OF THE UNIVERSITY COLLEGE HOSPITAL, IBADAN, NIGERIA

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BACKGROUND-AIM

Obesity is recognized worldwide as a serious health problem. Information on prevalence and associated risk factors is essential in its control. This study aimed to determine the prevalence and identify the risk factors of obesity among the senior staff of University College Hospital, Ibadan, Nigeria.

METHODS

A cross –sectional study was conducted on a total of 331 subjects who were senior staff of the University College Hospital, Ibadan. These subjects were randomly selected for the study. The subjects' weight and height were measured using standard procedures and body mass index (BMI) was calculated. Obesity was defined as BMI≥ 30kg/m2. Self-administered questionnaire was used in obtaining information on risk factors of obesity.Informed consent was taken from all participants.Statistical analysis was conducted using the Statistical Package for Social Sciences software (version 16.0). Frequency, Chi-square and Multiple logistic regression were employed and the associations were considered statistically significant at $P < 0.05$.

RESULTS

The majority of the sampled senior staff were overweight. The prevalence rates of overweight and obesity were 43.2% and 33.2% respectively. The risk factors that were associated with obesity include age (p=0.006), gender (p=0.001), cadre (p=0.010), marital status (p=0.002) and being a first degree relative of diabetics (p<0.001) while religion(p= 0.138), alcohol consumption (p= 0.106),family history of diabetes (p=0.076),sports activity (0.839), physical activity (p=0.978), education (p=0.156), tribe (p= 0.171) were not associated.Being a first degree relative of diabetics was the only independent risk factor of obesity among the studied population.

CONCLUSION

Considering the high prevalence of obesity in the studied group appropriate measures on the associated risk factors should be taken to prevent diabetes and cardiovascular disease in the future.

Obesity, metabolic syndrome

W351

PILOT STUDY: ANALYSIS OF LEPTIN, ADIPONECTIN AND ADIPONECTIN GENE POLYMORPHISM AND LEPTIN RECEPTOR IN OBESE CHILDREN AND ADOLESCENTS

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BACKGROUND-AIM

The aim is to determine serum levels of leptin and adiponectin of obese children and adolescents and to identify the influence of the polymorphisms of leptin receptor gene on leptin resistance and leptin levels. Also, to examine the association between the polymorphisms of adiponectin gene and adiponectin levels. Since today relationship between body fat mass and concentration of adipokines in the body has not been fully studied in children and adolescents and there lies the relevance of this study.

METHODS

A case-control study comparing a study group of 30 obese children and adolescents (age 13.2±2.6 years) to a normal weight age matched (age 12.7±2.9 years) control group of 30 children. In both groups BMI and waist and hip circumference, systolic and diastolic blood pressure were measured. Also, the classical metabolic parameters (fasting glycemia, total cholesterol and its fractions, serum triglycerides) were measured. Insulin sensitivity was evaluated using fasting insulinemia and HOMA-IR. Adiponectin and leptin levels were determined using ELISA method. PCR-RFLP based assay was utilized to genotype SNPs.

RESULTS

Serum level of leptin was significantly higher (34.0±20.4 ng/mL versus 9.1±6.4 ng/mL, $p < 0.001$), while adiponectin levels were significantly lower (3.56±1.1 ng/mL vs 6.78±0.36 ng/mL, $p < 0.001$) in the obese group compared to control group. LEPR SNPs were not significantly related to higher levels of leptin in the obese group nor in the non-obese (QR 43.3% vs 63.3%; QQ 40% vs 26.7%; RR 16.7% vs 10%, $p=0.297$). No significant association was identified between ADIPOQ SNPs (TT 56.7% vs 46.7%; GT 30% vs 43.3%; GG 13.3% vs 10%, $p=0.361$) and adiponectin levels in the case group compared to the control group.

CONCLUSION

The study confirms higher levels of circulating leptin and lower concentrations of adiponectin in case group. In children with obesity was not observed association of the ADIPOQ gene polymorphisms with adiponectin levels. Results suggest that genetic variability in the leptin receptor is not associated with higher leptin concentrations. It is assumed these results were underpowered due to a small pooled sample size, and analysis of additional studies with larger sample sizes should provide further clarifications.

Obesity, metabolic syndrome

W352

INCREASE IN BODY MASS INDEX (BMI) DOES NOT DECREASE HUMAN EPIDIDYMIS PROTEIN 4 (HE4) CONCENTRATIONS IN SERUM

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BACKGROUND-AIM

HE4 has recently been introduced as novel biomarker for detection and monitoring of ovarian cancer. Among factors of HE4 variation, an inverse relationship has been suggested between high BMI and lower serum HE4 concentrations. We sought to confirm this association on ad hoc study on women without history or current ovarian disease and/or other factors known to influence HE4 levels.

METHODS

103 women with BMI ranging from 19 to 57 kg/m², aged ≤55 years, no smokers, without gastrointestinal/gynaecological benign or malignant diseases and with serum creatinine concentrations ≤0.96 mg/dL were prospectively enrolled to undergo HE4 and CA125 measurements. Both markers in all samples were evaluated by Roche assays on the Modular EVO platform in a single run. Kruskal-Wallis ANOVA and multiple regression models were used to estimate differences among groups and the influence of BMI, adjusted for age and serum creatinine, on HE4 and CA125 concentrations.

RESULTS

We divided the enrolled subjects in 3 groups according to BMI values (in parentheses): A) normal weight (21.8±1.7), n=38; B) overweight or moderate obesity (29.1±2.9), n=31; C) grade II obesity (40.1±4.5), n=34. Neither HE4 nor CA125 concentrations showed significant differences among groups (A vs. B vs. C): 42.2±9.7 vs. 43.0±6.9 vs. 42.6±9.1 pmol/L for HE4 (P=0.84) and 13.2±5.5 vs. 15.1±7.6 vs. 17.3±14.2 kU/L for CA125 (P=0.47), respectively. Using multiple regression models, HE4 was significantly influenced by age (P<0.001) and serum creatinine (P=0.015), but not by BMI (P=0.93). None of the tested factors influenced CA125.

CONCLUSION

Our study was unable to confirm the previous evidence reported by Bolstad et al (Tumor Biol 2012;33:141) indicating that HE4 concentrations significantly decrease with the increase of BMI. This is relevant to interpret variation of HE4 concentrations, especially in those patients undergoing weight loss during chemotherapy for ovarian cancer.

Obesity, metabolic syndrome

W353

SEX HORMONE-BINDING GLOBULINE AND SEX STEROIDS IN OVERWEIGHT/OBESE POSTMENOPAUSAL WOMEN WITH METABOLIC SYNDROME

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BACKGROUND-AIM

A hallmark of the menopausal transition is the reduction in estradiol levels with the shift toward androgen dominance, which may explain higher incidence of metabolic syndrome (MS) after menopause. So, we aimed to examine serum levels of sex hormone-binding globuline (SHBG) and sex steroids (total estradiol and testosterone) in overweight/obese postmenopausal women with MS and to investigate their potential association with MS components.

METHODS

A total of hundred overweight/obese postmenopausal women, mean age 56.7± 4.8 years (49 without MS and 51 with MS) without diabetes, thyroid dysfunction or cardiovascular disease, and who were not using hormonal therapy or any other medication, were included in this cross-sectional study. MS was defined using International Diabetes Federation criteria. Biochemical parameters were measured. Insulin resistance was calculated (HOMA-IR).

RESULTS

Women with MS displayed higher serum total testosterone level (1.10±0.35 vs. 0.92±0.30 nmol/L respectively, p=0.009), and lower SHBG level (46.51±18.01 vs. 62.20±21.48 nmol/L respectively, p<0.001), but they did not differ in serum total estradiol level (56.03±17.18 vs. 57.08±16.18 pmol/L, respectively, p=0.751), as compared with the control group. In linear regression model, SHBG correlated with waist circumference (WC) (ρ= - 0.556, p<0.001), HOMA-IR (ρ= - 0.732, p<0.001), HDL-cholesterol (ρ=0.234, p=0.020), triglycerides (ρ= - 0.243, p= 0.015) and systolic blood pressure (SBP) (ρ= - 0.518, p<0.001). Unlike total estradiol, total testosterone correlated with HOMA-IR (ρ= 0.230, p=0.022), and SBP (ρ=0.215, p=0.033). In multiple regression analysis SHBG correlated with HOMA-IR and WC (R2 = 0.483, p<0.001) independently.

CONCLUSION

Serum SHBG correlated better with MS components than total testosterone. Moreover, SHBG correlated with HOMA-IR independently. Therefore, SHBG may be important determinant of MS.

Obesity, metabolic syndrome

W354

CORRELATION BETWEEN AUTOMATED-QUANTIFICATION OF HMW ADIPONECTIN AND ELISA-QUANTIFICATION OF TOTAL ADIPONECTIN IN PATIENTS WITH METABOLIC SYNDROME

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BACKGROUND-AIM

Adiponectin, an adipocyte-specific secretary protein, that exists as multiple isoforms such as trimeric, hexameric and high-molecular-weight (HMW), regulates insulin sensitivity and lipid metabolism. Low level of circulating adiponectin or HMW adiponectin is associated with high incidence of diabetes and coronary artery disease. Until recently, quantification of HMW adiponectin needed pretreatment with protease before quantification with ELISA that is time consuming. Characterization of a monoclonal antibody that specifically recognizes HMW isoform allowed the development of an automated-quantification of HMW adiponectin by Fujirebio (Europe N.V.). The aim of this study was to evaluate the automated-quantification of HMW adiponectin with the Lumipulse® G1200 (Fujirebio) and to compare levels of HMW adiponectin to total adiponectin in healthy volunteers and in patients with metabolic syndrome.

METHODS

87 serum samples from healthy volunteers (n=36) and patients with metabolic syndrome (n=51) were analyzed with Lumipulse® G1200 (Fujirebio) for HMW adiponectin, quantification and with ELISA kit (ALPCO, Eurobio) for total adiponectin.

RESULTS

Analytical evaluation of automated-quantification of HMW adiponectin revealed that the assay range was from 0.2 to 15.0 µg/mL with linearity from 0.2 to 22 µg/mL. Intra- and inter-assay coefficients of variation were below 2.8% and 2.5% respectively. The median [10th - 90th percentile] of HMW adiponectin concentration in serum samples from healthy volunteers were 3.2 [0.8 – 5.0] µg/mL for male (n=16) and 4.8 [2.7 – 7.5] µg/mL for female (n=20). We observed a good correlation ($p<0.0001$) between serum levels of HMW adiponectin quantified by Lumipulse® G1200 (Fujirebio) and total adiponectin quantified by ELISA (ALPCO, Eurobio) in the group of patients with metabolic syndrome.

CONCLUSION

The automated-quantification of HMW adiponectin on Lumipulse® G1200 is more convenient and faster than ELISA technique. Moreover a strong correlation was observed between HMW adiponectin and total adiponectin. Accordingly, automated-quantification of HMW adiponectin could be proposed to replace total adiponectin determination in clinical laboratory.

Obesity, metabolic syndrome

W355

ELEVATED POSTPRANDIAL GLUCAGON AND GLICENTIN SECRETION IN PATIENTS WITH POSTPRANDIAL HYPOGLYCEMIA-LIKE SYMPTOMS AFTER BARIATRIC SURGERY

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BACKGROUND-AIM

Gastric bypass is one of the most efficient strategies for long-term weight loss and reduction of the comorbidities associated with morbid obesity. However hypoglycemia or hypoglycemia-like symptoms have been identified as a late complication of gastric bypass in a small number of patients. The etiology and metabolic characteristics remain incompletely understood. The aim of this study was to establish relationships between glucose homeostasis and postprandial secretions of enteroinsular axis hormones in patients with hypoglycemic symptoms occurring after bariatric surgery.

METHODS

Fourteen patients who had undergone gastric bypass surgery and presented hypoglycemia-like symptoms were recruited for this study. Plasma glucose, C-peptide (Diasorin), glucagon-like peptide-1 (ELISA, ALPCO), glucagon and glicentin (ELISA, Mercodia) were measure before and 30, 60, 90 and 120 min after ingestion of a liquid mixed meal (FRESUBIN, 400ml, 800 kcal).

RESULTS

Among 14 patients with hypoglycemia-like symptoms, only 42 % (n=6) presented postprandial hypoglycemia (glucose< 3 mmol/L) through the 120 min period. We quantified postprandial hormone secretion of enteroinsular axis and calculated the area under the curve (AUC) for C-Peptide, GLP-1, glucagon and glicentin. We found a high positive correlation between glucose AUC and C-peptide AUC (p=0.0036). However we did not observe significant correlation between glucose AUC and AUC for GLP-1, glucagon and glicentin. Surprisingly we did not observed correlation between C-peptide AUC and GLP-1 AUC (p= 0.228) but we found significant positive correlation between C-peptide AUC and glucagon AUC (p=0.017) as well as between C-peptide AUC and glicentin AUC (p=0.006) suggesting that these hormones could be involved in insulin secretion in patients with hypoglycemia-like symptoms after bariatric surgery.

CONCLUSION

Glicentin is produced by the enteroendocrine L-cells after processing of the preproglucagon protein. It is secreted in response of luminal glucose stimulation. It was suggested that glicentin should stimulate insulin secretion. Ours preliminary results suggest that elevated secretion of glicentin by the intestinal tract might be involved in patients with postprandial hypoglycemia symtoms.

Obesity, metabolic syndrome

W356

SAGITTAL ABDOMINAL DIAMETER – A NEW AND BETTER PREDICTOR OF CARDIOMETABOLIC RISK AND THE OCCURRENCE OF METABOLIC SYNDROME IN OVERWEIGHT/OBESE WOMEN.

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BACKGROUND-AIM

The commonly used obesity indicators: waist circumference (WC), body mass index (BMI) and waist to hip ratio (WHR) have limited ability to estimate the visceral adipose tissue mass. Sagittal abdominal diameter (SAD) has been shown to predict the amount of visceral fat. We assessed SAD as a measure of cardiometabolic risk and compared with other anthropometric indices in overweight/obese women.

METHODS

Fasting glucose, HbA1c, lipids, apolipoprotein B and A-I , hsCRP were determined in blood obtained from women with excessive body mass (n=100; BMI≥25 kg/m2) and healthy controls (n=50; BMI<25kg/m2). Atherogenic ratios were calculated. All subjects underwent blood pressure and anthropometric measurements. SAD was measured in the supine position at the top of the iliac crest with a Holtain Kahn abdominal caliper.

RESULTS

SAD correlated with most of the biochemical markers and blood pressure values. As the only one, SAD correlated with glucose (r = 0.22, P = 0.05) and ApoB/ApoA1 ratio (r = 0.26, P = 0.03) and was more strongly related to HbA1c (r = 0.32, P = 0.005), ApoA1 (r = -0.43, P = 0.00009) and hsCRP (r = 0.44, P = 0.0001) than other anthropometric indices. SAD the most strongly predicted cardiometabolic risk with OR 1,4 (95% CI 1.18-1.62) p=0,00004; OR 1,2 (95% CI 1.01-1.41) p=0,03; OR 1,9 (95% CI 1.51-2.33) p=0,00000001; OR 1,3 (95% CI 1.14-1.50) p=0,00006; OR 1,8 (95% CI 1.34-2.27) p=0,00002; OR 1,3 (95% CI 1.13-1.57) p=0,0004 for having elevated glucose, TG, hsCRP, ApoB/ApoA1, TG/HDL, SBP and reduced HDL-C with OR 1,7 (95% CI 1.40-2.07) p=0,000005. Furthermore SAD more strongly predicted metabolic syndrome with OR 1,7 (95% CI 1.38-2.11) p=0,000005 than common anthropometric indices. SAD had highest values of AUC for glucose, HbA1c, ApoB, ApoB/ApoA1 ratio and hsCRP concentration in comparison with WC, WHR and BMI.

CONCLUSION

A stronger correlation between SAD and cardiometabolic risk factors supports its use as a new better predictor of prediabetes and atherogenic risk in young overweight/obese women.

Obesity, metabolic syndrome

W357

INTERACTION OF ADIPOQ AND ADIPOR2 POLYMORPHISMS ON INSULIN RESISTANCE WITH INCREASE OF PRO-INFLAMMATORY MARKERS

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BACKGROUND-AIM

Insulin resistance (IR) is a state characterized by an impaired cellular response to insulin. Its development is the result of interaction between environment factors and predisposition genes, conferring susceptibility. The goal was to determinate the interaction between ADIPOQ single nucleotide polymorphisms (SNPs) (-11391 G/A, and 45 T/G), and its receptor 2, ADIPOR2 (rs767870 A/G) in Mexican-Mestizo with IR.

METHODS

183 individuals were included in a cross-sectional, all participants met a physical examination, and completed a questionnaire about medical history, also, anthropometrics and corporal composition measures were taken. We obtained venous blood samples to extract gDNA for genotypes determination, using PCR-RFLP technique and to measure biochemical markers by routine methods. Subjects were classified in accordance with Stern criteria in a control group (BMI $\geq$ 18.5 kg/m2 & HOMA-IR < 3.60), and individuals with IR (BMI $\geq$ 27.5 kg/m2 & HOMA-IR $\geq$ 3.60). Multidimensional Reduction (MDR) analysis was made to find out the possible interaction between SNPs and IR.

RESULTS

In our study group we found important correlations of insulin serum levels and HOMA-IR magnitude with total body fat percentage (r= 0.60, P < 0.001; r= 0.60, P < 0.001), waist (r= 0.48, P < 0.001; r= 0.48, P < 0.001), and C reactive protein (r= 0.47, P < 0.001; r= 0.45, P < 0.001). The genotypic frequencies were found in accordance with Hardy-Weinberg equilibrium for the three SNPs [-11391 G/A: G/G= 148 (93.1%), G/A= 11 (6.9%), A/A= 0 (0.0%); 45 T/G: T/T= 104 (65.4%), T/G= 47 (29.6%), G/G= 8 (5.0%); rs767870 A/G: A/A= 120 (75.5%), A/G= 36 (22.6%), G/G= 3 (1.9%)]. We observed no differences among IR and control groups in genotypic and allelic frequencies, neither linkage disequilibrium in haplotypes analysis was found. However, do exist difference (P = 0.041) in haplotypes proportion in IR group against control. The combination of genotypes: -11391G/G, 45T/T, and rs767870A/A was determined as low risk, by MDR analysis, for IR.

CONCLUSION

The adiposity and pro-inflammatory state are directly associated to IR development, besides, the presence of at least one polymorphic allele is a risk factor for IR establishment.

Obesity, metabolic syndrome

W358

MCP-1 SERUM LEVELS AND INFLAMMATION MARKERS ASSOCIATED WITH THE PHENOTYPE G- OF POLYMORPHISM -2518G>A IN A MEXICAN POPULATION WITH INSULIN RESISTANCE

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BACKGROUND-AIM

Obesity is the storage in excess of white adipose tissue, in which a low-grade, chronic, sub-clinic inflammatory reaction, called “metabolic inflammation”, is manifested secondary at the increment of the adipose tissue. Insulin resistance (IR) develops from this inflammatory state, which is the first step in the development of type 2 diabetes mellitus. The major molecule perpetuating the inflammatory process is MCP-1 (secreted by white adipose tissue), which promotes monocyte migration to adipose tissue. The polymorphism -2518 G>A has been suggested regulates expression of the MCP-1 gene and has been associated with obesity comorbidities and inflammatory process. AIM: To determine the association of levels of sMCP-1 and inflammatory markers with polymorphism -2518G>A MCP-1 in Mexican mestizos with RI.

METHODS

In a cross-sectional study with ethical considerations, 380 Mexican-mestizos, classified by BMI and RI were included. Were measured by routine methods inflammatory markers, metabolic and adiposity, sMCP-1 by ELISA and polymorphism -2518G>A by PCR-RFLP.

RESULTS

The following differences (P <0.05) were observed between individuals with and without RI:
1) genotype frequencies (GG: 14%, 29%; GA: 53%, 41%; AA: 33%, 30%), with higher contribution of the A+ phenotype;
2) in individuals with A# phenotype (genotype GG) versus A+ phenotype (GA plus AA genotypes) differences were observed in sLeptin (#x= 7.7 ±7.68; #x= 49.4 ±3.44 ng/mL) and sAdiponectin levels (##x= 4,926 ±334, #x= 3,722 ±430 ng/mL); and
3) in individuals with G- phenotype (AA genotype) versus G+ (GG plus GA genotypes) in sMCP-1 (#x= 280 ±21.6, #x= 191 ±14.9 ng/mL), C-reactive protein (#x= 2.8 ±2.98, #x= 2.2 ±2.29 mg/L) and hip circumference (#x= 104 ±11.4, #x= 101 ±9.7 cm). sMCP-1 correlated with inflammation markers, metabolic and hip circumference (r= 0.190 to 0.350).

CONCLUSION

sMCP-1 levels and G- phenotype are associated with low-grade inflammatory process, adipokine profile and abnormal body fat distribution in Mexican-Mestizo population with insulin-resistance.

Obesity, metabolic syndrome

W359

INTERACTION OF ADIPOQ AND ADIPOR2 POLYMORPHISMS ON INSULIN RESISTANCE WITH INCREASE OF PRO-INFLAMMATORY MARKERS

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BACKGROUND-AIM

Insulin resistance (IR) is a state characterized by an impaired cellular response to insulin. Its development is the result of interaction between environment factors and predisposition genes, conferring susceptibility. The goal was to determinate the interaction between ADIPOQ single nucleotide polymorphisms (SNPs) (-11391 G/A, and 45 T/G), and its receptor 2, ADIPOR2 (rs767870 A/G) in Mexican-Mestizo with IR.

METHODS

This cross-sectional study included183 individuals, all participants met a physical examination, and completed a questionnaire about medical history, also, anthropometrics and corporal composition measures were taken. We obtained venous blood samples to extract gDNA for genotypes determination, using PCR-RFLP technique and to measure biochemical markers by routine methods. Subjects were classified in accordance with Stern criteria in a control group (BMI $\geq$ 18.5 kg/m2 & HOMA-IR < 3.60), and individuals with IR (BMI $\geq$ 27.5 kg/m2 & HOMA-IR $\geq$ 3.60). Multidimensional Reduction (MDR) analysis was made to find out the possible interaction between SNPs and IR.

RESULTS

In our study group we found important correlations of insulin serum levels and HOMA-IR magnitude with total body fat percentage (r= 0.60, P < 0.001; r= 0.60, P < 0.001), waist (r= 0.48, P < 0.001; r= 0.48, P < 0.001), and C reactive protein (r= 0.47, P < 0.001; r= 0.45, P < 0.001). The genotypic frequencies were found in accordance with Hardy-Weinberg equilibrium for the three SNPs [-11391 G/A: G/G= 148 (93.1%), G/A= 11 (6.9%), A/A= 0 (0.0%); 45 T/G: T/T= 104 (65.4%), T/G= 47 (29.6%), G/G= 8 (5.0%); rs767870 A/G: A/A= 120 (75.5%), A/G= 36 (22.6%), G/G= 3 (1.9%)]. We observed no differences among IR and control groups in genotypic and allelic frequencies, neither linkage disequilibrium in haplotypes analysis was found. However, do exist difference (P = 0.041) in haplotypes proportion in IR group against control. The combination of genotypes: -11391G/G, 45T/T, and rs767870A/A was determined as low risk, by MDR analysis, for IR.

CONCLUSION

The adiposity and pro-inflammatory state are directly associated to IR development, besides, the presence of at least one polymorphic allele is a risk factor for IR establishment.

Obesity, metabolic syndrome

W360

RELATIONSHIPS OF CD36 RECEPTOR EXPRESSION ON MONOCYTE MEMBRANE AND SOLUBLE LEVELS, WITH ADIPOSITY AND METABOLIC MARKERS IN OBESE AND HEALTHY ADULTS

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BACKGROUND-AIM

Adipose tissue has radical changes in obesity, this includes mainly infiltration of pro inflammatory macrophages, and the increase in size and number of adipocytes. These two cells express the CD36 receptor; in adipocytes serves as a fatty acid translocase and in macrophages acts as the main recipient of oxLDL. The close cross-talk that occurs between this cells has not been completely established on physiological and pathologic states. The aim was to determine CD36 receptor expression on monocyte membrane, soluble levels of the receptor and immune-metabolic profile in two groups: obese and healthy subjects.

METHODS

Cross sectional study was conducted that included 112 individuals classified by Deurenberg´s adiposity index, in two groups: with and without obesity. The measurement of CD36 expression was performed on peripheral blood mononuclear cells by flow cytometry, subsequently software analysis were performed to determine Mean Fluorescence Intensity (MFI). Inflammatory, metabolic and adiposity markers were measured by routine methods, and soluble levels of CD36 by ELISA.

RESULTS

We found differences (P< 0.001) on levels of lipid profile, glucose, insulin, and C-reactive protein, and erythrocyte sedimentation rate between both groups.
Also we observed on the obese group, a higher expression on the monocyte membrane CD36 receptor, than healthy subjects (average = 227.24 ± 106.41 vs 170.10 ± 105.05 P = 0.046, MFI), however the levels of the soluble portion of the CD36 receptor no differences showed (average = 11.52 ± 18.51 vs 12.49 ± 23.79 ng/mL), respectively. Negative correlation of sCD36 levels with the expression on monocyte membrane CD36 receptor, was found (r= -0.279, P = 0.029); as well as the MFI with hip circumference (r= 0.307, P = 0.015), waist-to-height ratio (r= 0.253, P = 0.048) and low density lipoprotein cholesterol (LDLc) levels (r= 0.342, P = 0.006).

CONCLUSION

The obese subjects shown increase of CD36 receptor expression on monocyte membrane and correlates to soluble levels of the CD36 receptor. This suggest that CD36 receptor may be an important modulator in the metabolic transition observed in obesity.

Obesity, metabolic syndrome

W361

HORMONAL STUDY OF OBESITY IN PATIENTS BEFORE AND AFTER BARIATRIC SURGERY AND NORMOWEIGHT CONTROLS

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BACKGROUND-AIM

Obesity is a health problem of first magnitude worldwide. Understanding the role of hereditary, biochemical, behavioral and environmental factors in the control of body weight may greatly help to optimize current therapeutic approaches such as bariatric surgery. We have tried to further increase this knowledge by assessing the hormonal state of morbid obese patients with respect to normoweight controls, as well as the evolution of hormones in patients undergoing bariatric surgery.

METHODS

Adiponectin (ADI), ghrelin (GHR), leptin (LEP) and insulin (INS) were quantified by ELISA (EMD Millipore Corporation) in serum samples from 59 normoweight volonteers (body mass index, BMI < 25), 64 morbid obese patients (BMI > 40), and 64 morbid obese patients undergoing bariatric surgery just before and one year after intervention. Statistical analysis was performed using t-student test with SPSS v17.0.

RESULTS

Serum levels of control subjects were (mean ± SD): ADI, 44.25±31.14 ng/mL; GHR, 618.61±325.50 pg/mL; LEP, 16.84±12.81 ng/mL and INS, 5.59±3.85 uU/mL. In the case of obese patients, the concentrations obtained were: ADI, 25.36±28.39; GHR, 304.53±207.72; LEP, 45.96±17.45 and INS, 29.04±18.44. In morbid obese patients undergoing bariatric surgery the hormonal levels before intervention were: ADI, 20.44±17.92; GHR, 257.2±205.3; LEP, 45.16±14.54 and INS, 34.60±20.99; one year after surgery the concentrations obtained were: ADI, 47.62±31.93; GHR, 314.4±254.5; LEP, 13.35±12.12 and INS, 8.36±9.15. The differences between morbid obese and control subjects achieved statistical significance in all cases (P <0.01). Differences were also significant in patients before bariatric surgery and one year after bariatric surgery concerning ADI, LEP and INS (P <0.01), but not in the case of GHR.

CONCLUSION

The serum hormonal profile of morbid obese patients is markedly different to that of normoweight controls. One year after bariatric surgery these differences are attenuated since INS and LEP significantly decrease while ADI increases. However, GHR does not recover after surgery. Further studies are needed to verify the diagnostic and predictive value of hormonal biomarkers in these patients.

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Obesity, metabolic syndrome

W362

INCREASED CARDIOMETABOLIC RISK FACTORS IN OVERWEIGHT, OBESE AND ABDOMINALLY OBESE CHILDREN AND ADOLESCENTS OR ABDOMINAL OBESITY

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BACKGROUND-AIM

Obesity potentiates the development of cardiometabolic disorders due to its association with low-grade inflammation, hypertension and dyslipidemia. We aimed to assess the presence of cardiovascular risk factors in overweight, obese or abdominally obesity children and adolescents from a semirural city in southern Brazil.

METHODS

A total of 399 children and adolescents of public schools, aged 6-15 y, 52% girls, participated in this sectional study. Fasting blood was collected for laboratory analysis. The small dense LDL-cholesterol (sd-LDL-c) was measured by the homogeneous LDL-c method after the precipitation of lipoproteins. Anthropometric variables and blood pressure were measured and nutritional status was defined according to the percentile of BMI-for-age. Abdominal obesity was established from the circumference measurement according to sex and age. Differences in the variables according to nutritional status were detected by the chi-square test or ANOVA (significance $P < 0.05$).

RESULTS

The results for the prevalence of students with overweight, obesity and abdominal obesity were 13.3, 11.5, and 26.8%, respectively. Obese students had higher levels of triglycerides (95.0 mg/dL) and sd-LDL-c (50.5 mg/dL) and low HDL-c levels (47.1 mg/dL) than eutrophic students (66.1, 35.0 and 56.6 mg/dL, respectively; $P < 0.001$). Values for the prevalence of hypertriglyceridemia and low HDL-c were, respectively, 2.6 and 17.2% in eutrophic, 13.2 and 26.4% in overweight, 21.7 and 37.0% in obese and 3.1 and 22.0% in abdominally obese students ($P < 0.015$). There was a higher prevalence of hypertension grade I and II in students with abdominal obesity (18.7 and 6.3%, respectively), overweight (11.3 and 7.5%) and obesity (30.4 and 19.6%) compared with eutrophic students (7.9 and 1.5%) ($P < 0.001$). The prevalence of high levels of hs-CRP and uric acid increased, respectively, from 8.9 and 1.5% in eutrophic to 7.5 and 19% in overweight, 15.6 and 19.6% in abdominally obese and 28 and 39% in obese students ($P < 0.001$).

CONCLUSION

Our results confirmed that clusters of cardiometabolic risk factors are present in a significant number of children and adolescents with obesity and abdominal obesity, which may increase the risk for cardiovascular disease in adulthood.

Obesity, metabolic syndrome

W363

METABOLIC SYNDROME IN CHILDREN AND ADOLESCENTS FROM A SEMIRURAL CITY IN SOUTHERN BRAZIL

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BACKGROUND-AIM

Obesity in childhood and adolescence is increasing worldwide and the prevalence of cardiovascular risk factors associated with metabolic syndrome (MS) is also becoming a cause for concern. In this study, we assessed normal weight, overweight and obese children and adolescents in a semirural city in southern Brazil for the presence of MS, and the prevalence of associated risk variables was determined.

METHODS

We evaluated 399 students (6-15 y; 52.1% girls; 67.2% eutrophic, 13.3% overweight, and 11.5% obese). Anthropometry and laboratory analysis were performed. MS was defined as the presence of at least three of the following components: increased serum triglycerides, glucose, blood pressure and waist circumference (WC) and decreased serum HDL-cholesterol. Insulin resistance (IR) was identified from the homeostasis model assessment for IR (HOMA-IR) index. LDL particle size was estimated by [LDL (nm) = 26.262 - 0.776 (TG mmol.L^{-1}/HDL-c mmol.L^{-1})], and small dense LDL-cholesterol (sd-LDL) was measured by the homogeneous LDL-c method after the precipitation of lipoprotein. Differences were detected by the chi-square test or ANOVA (significance $P < 0.05$).

RESULTS

The prevalence of MS was 8.8% in the total sample and 2.2% in eutrophic, 18.9% in overweight and 41.3% in obese students ($P < 0.001$), with no differences between boys and girls. Compared to normal students, MS students had higher levels and prevalence of all components of MS, in addition to sd-LDL-c, LDL particle size, insulin and IR ($P < 0.001$). High blood pressure was found in 77.1%, hypertriglyceridemia in 68.6% and low levels of HDL-c in 65.7% of students with MS. Prevalence of sd-LDL-c higher than 50% of LDL-c was 37.1 in MS students and 16.2% in normal students ($P = 0.002$). Obese students with MS had higher prevalence of IR (75.0%), low HDL-c (56.6%), high blood pressure (55.5%) and hypertriglyceridemia (50.0%) compared to overweight and eutrophic MS students ($P < 0.03$).

CONCLUSION

Obese children and adolescents from a semirural city in southern Brazil showed a high prevalence of MS. Cardiovascular risk factors, such as IR and sd-LDL particles, were also evident in this population, highlighting the need to create therapeutic intervention programs.

Obesity, metabolic syndrome

W364

ASSOCIATION BETWEEN ADIPONECTIN 45T/G, 5522C/T AND 276G/T POLYMORPHISMS, LEPTIN G2548A POLYMORPHISMS AND OBESITY RISK A TUNISIAN COMMUNITY BASED STUDY

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BACKGROUND-AIM

Adiponectin (ADIPOQ) is a plasma protein produced by the adipose tissue,with insulin sensibility, anti-inflammatory and anti-atherogenic properties.
Leptin(LEP)is secreted by adipocytes and plays an important role in the regulation of appetite,atherogenesis and growth.We studied the association between three ADIPOQ (45T/G,4522C/T and 276G/T) polymorphisms,G2548A LEP gene and the risk of obesity and lipid profile in a tunisian community based study HSHS«Hammam Sousse Sahloul Heart Study»

METHODS

We have recruited from the HSHS 375 nonobese(mean age 47,36 ± 13,43 years; mean body mass index(BMI)25,67±2,85 kg/m2)and 221obese(BMI≥30kg/m2)(mean age 50,47±11,18years;BMI33,95±3,33kg/m2).Genotyping was performed using polymerase chain reaction restriction fragment length polymorphism.Serum lipids and anthropometric parameters were measured.Statistic analysis was performed on SPSSv19

RESULTS

The frequencies of the ADIPOQ genotypes don't differ significantly between the nonobese and obese groups;
-45T/G frequencies (TT:59.5%,TG:37.3%,GG:3.2%) vs (TT: 62.4%,TG:33%,GG:4.5%)[p=0.453]
-4522C/T frequencies (CC: 58.7%, CT:33.6%,TT:7.7%) vs (CC:57.9%,CT:34.8%,GG:7.2%) [p=0.941]
-276G/T frequencies (GG:19.7%,GT:50.9%,TT:29.3%) vs (GG:19.9%,GT:51.1%,TT:29%) [p=0.995]
Mutated genotypes of 4522C/T were associated with increase in HDL-C(mmol/l) (TT:1.18±0.34; CT:1.12±0.34;CC:1.11±0.29),p=0.017
Whereas mutated genotype of 276G/T were associated with lower LDL-C(mmol/l) (GG:3.55±0.82;GT:3.3±0:73;TT:3.2±0.7),p=0.011
A significant association was observed between G2548A of Leptin and obesity risk and persists after adjustment to potential confounder factors. The adjusted odds ratio of obesity associated to AG and AA compared with GG were respectively 2.22[1.33-3.69],p=0.002 and 2.56[1.97-3.3],p<0.001 and mutated genotypes had significantly higher BMI(p<0.001),waist (p<0.001) and Hip circumference(p<0.001)

CONCLUSION

This study showed that G2548A Lep polymorphisms,but not the three ADIPOQ polymorphisms,was associated with obesity risk and with higher waist and hip circumferences

Obesity, metabolic syndrome

W365

CLINICAL AND ANALYTICAL EFFECT OF WEIGHT LOSS IN A POPULATION OF METABOLICALLY HEALTHY OBESE WOMEN

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BACKGROUND-AIM

There is much uncertainty about whether the weight loss in metabolically healthy obese (MHO) subjects brings benefits in terms of metabolism. The main aim was to compare the metabolic benefit in MHO, a loss of light or heavy weight.

METHODS

105 MHO women were included, with a body mass index (BMI) 30-50 kg/m2 and an age between 35-55 years. MHO subjects with one or no cardiovascular risk factor (PA ≤135/85 mmHg, basal fasting glucose ≤100 mg/dl, c-HDL≤50 mg/dl or triglycerides ≤150 mg/dl) was considered. Population were randomized into two groups: non-responder group (NRG), who lost weight over 1% and responder group (RG), who lost weight over 10%.

RESULTS

Anthropometric, analytical, adipokines and inflammatory markers at baseline and after weight loss were analyzed in a period of time of 3 months. The mean age of the population was 44.4 ± 3.7 years. NRG slightly decreased their weight (91.2 ± 13.8 vs 90.3 ± 13.9 kg; p=0.01). Uric acid, total cholesterol, c-LDL, fatty liver index, resistin, IL-6, TNF-a decreased significantly. Instead, levels of insulin, HbA1c, and adiponectin were increased significantly. RG decreased significantly their weight (92.5 ± 14.2 vs 83.2 ± 13.4 kg; p <0.0001). The levels of glycemia, HOMA index, total cholesterol, c-LDL, ApoB100, IL-6, TNF -a, and fatty liver index were decreased significantly.

CONCLUSION

Only the MHO sujects who achieved significant weight loss, managed to improve the sensitivity to insulin, lipoprotein profile and normalize adipokines levels.

Obesity, metabolic syndrome

W366

INCREASED LEVELS AND PREVALENCE OF SMALL DENSE LDL PARTICLES AND INSULIN RESISTANCE IN OVERWEIGHT, OBESE AND ABDOMINALLY OBESE CHILDREN AND ADOLESCENTS

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BACKGROUND-AIM

Obesity and overweight in children and adolescents are associated with adverse health effects, including dyslipidemia and insulin resistance (IR), which increase cardiovascular risk. We aimed to assess the presence of the more atherogenic lipoproteins, small dense LDL (sd-LDL) and IR in students with overweight, obesity or abdominal obesity from a semirural town in southern Brazil.

METHODS

Volunteer children and adolescents attending public schools (n = 399), aged 6-15 y, 52% girls, participated in the study. Fasting blood was collected for laboratory analysis. IR was identified by the homeostasis model assessment for IR (HOMA-IR) index. The sd-LDL-cholesterol (sd-LDL-c) was measured by the homogeneous LDL-c method after the precipitation of lipoproteins, while LDL particle size was estimated using the formula [LDL (nm) = 26.262 - 0.776 (TG mmol.L^{-1}/HDL-c mmol.L^{-1})]. Differences in the variables according to nutritional status were detected by the chi-square test or ANOVA (significance $P < 0.05$).

RESULTS

Overweight was identified in 13.3% of students, obesity in 11.5% and abdominal obesity in 26.8%, while 48.4% were eutrophic. Mean levels of sd-LDL-c were 35.0, 36.1, 39.4 and 50.5 mg/dL in eutrophic, abdominally obese, overweight and obese students, respectively ($P < 0.001$). LDL-c levels were similar for all students regardless of nutritional status. The results for the prevalence of sd-LDL-c higher than 50% of LDL-c and LDL size $\leq$ 25.5 nm were, respectively, 12.3 and 9.5% in eutrophic, 29.9 and 30.9% in abdominally obese, 26.4 and 32.1% in overweight and 39.1 and 47.8% in obese students ($P < 0.001$ for both parameters). Insulin levels increased from 5.0 μUI/mL in eutrophic students to 8.7, 7.4 and 9.4 μUI/mL in those with abdominal obesity, overweight or obesity, respectively ($P < 0.001$). No differences were observed for glucose levels. Prevalence of IR was 3.7 in eutrophic students and 15.6, 9.4 and 17.4% in students with abdominal obesity, overweight and obesity, respectively ($P < 0.001$).

CONCLUSION

The levels and prevalence of sd-LDL, insulin and IR are strongly related to the body composition of children and adolescents. The non-eutrophic conditions studied may represent an increased risk for developing metabolic disorders in adulthood.

Obesity, metabolic syndrome

W367

ELF TEST IN THE ASSESSMENT OF NON ALCOHOLIC FATTY LIVER DISEASE

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BACKGROUND-AIM

There is a wide spectrum of liver histology in Non alcoholic fatty liver disease (NAFLD), ranging from steatosis to steatohepatitis (NASH), fibrosis and cirrhosis. Steatosis usually remains stable but patients with NASH or fibrosis have a higher risk for complications.
Liver biopsy is the standard for the diagnosis of NAFLD but has risks and limitations, so that non-invasive diagnostic tools such as serum biomarkers and imaging methods have been developed.
ELF is a diagnostic algorithm of liver fibrosis that combines three serum direct markers: hyaluronic acid, procollagen III amino terminal peptide and tissue inhibitor of metalloproteinase 1. The result becomes a score without units that indicates the level of fibrosis.
Acoustic Radiation Force Impulse (ARFI) is a imaging technique that provides a quantitative measure of the tissue elasticity and correlates with the degree of fibrosis.
We aimed to assess feasibility of ELF to differentiate NAFLD from NASH and fibrosis in morbidly obese before bariatric surgery using liver biopsy as a reference standard.

METHODS

We selected 57 morbidly obesity patients who were to undergo bariatric surgery and were classed according to their hepatic biopsy findings. Group A: normal liver or simple steatosis; Group B: NASH and/or fibrosis. All patients were evaluated with ARFI (Acuson S2000, Siemens) before surgery and ELF test (ADVIA Centaur, Siemens) was calculated.

RESULTS

Significant differences in ELF results were found between the two groups (p=0,002). The area under the ROC curve for differentiating patients with NASH or fibrosis from those with normal liver or simple steatosis using ELF was 0,780 (p=0,002). The cut-off value was 8,69 (72,1% Sensitivity; 75,5% Specifity). Also ELF index showed a significant correlation with results of ARFI (r= 0,375 p=0,005).

CONCLUSION

A proper hepatic assessment enabling NAFLD to be differentiated from NASH or fibrosis would be fundamental for establishing a risk population. Our results show that ELF is a useful diagnostic tool for differentiating this in morbidly obesity patients.

Obesity, metabolic syndrome

W368

ABSENCE OF INTERLEUKIN-33 IN MICE DRIVES PREVALENCE OF PRO-INFLAMMATORY MACROPHAGES IN ADIPOSE TISSUE AND OBESITY DEVELOPMENT.

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BACKGROUND-AIM

Interleukin (IL)-33 is a member of the IL-1 family and the ligand of the ST2 receptor. IL-33 and ST2 levels are elevated in adipose tissue of obese humans and mice. The aim of this study was to investigate the development of obesity in IL-33 deficient (IL-33-/-) mice.

METHODS

IL-33-/- mice and IL-33+/+ littermates were fed either high fat diet (HFD) or low fat diet (LFD) for 18 weeks. Body weight was monitored weekly and oral glucose tolerance tests (oGTT) and insulin tolerance tests (ITT) were performed after 16 and 17 weeks on diet, respectively. Organs were weighed at the day of sacrifice, and stored for histological, mRNA and protein analyses. The stromal vascular fraction (SVF) was isolated from epididymal white adipose tissue (eWAT) and analysed by flow cytometry.

RESULTS

IL-33-/- mice displayed impaired glucose tolerance on both HFD and LFD ($p \leq 0.05$). Of note, 15 minute oGTT insulin levels were lower in IL-33-/- mice on HFD compared to wild type controls ($p \leq 0.05$). After 2 hours fast, IL-33-/- mice on HFD displayed higher blood glucose levels that littermate controls while ITTs revealed no obvious difference in insulin sensitivity. Body weight did not differ between IL-33-/- and IL-33+/+ mice after 18 weeks on a particular diet. Interestingly, SVFs of obese IL-33-/- mice contained a higher percentage of proinflammatory (M1-like) macrophages (38±2% as compared to 11±3% in IL-33+/+) and a lower percentage of antiinflammatory M2-like macrophages (23±2% as compared to 47±3% in IL-33+/+). Further, IL-10 mRNA levels were lower in SVF and adipocyte fractions obtained from eWAT of IL-33-/- mice on HFD as compared to HFD fed wildtype littermates.

CONCLUSION

IL-33 is protective during obesity development in mice by influencing glucose tolerance as well as adipose macrophage subset distributions.