CENTRAL EUROPEAN CONGRESS ON OBESITY: FROM NUTRITION TO METABOLIC SYNDROME
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Stearoyl-CoA desaturase (SCD) is the rate limiting enzyme catalyzing the biosynthesis of monounsaturated fatty acids, mainly oleate and palmito-leoate, which are used as substrates for the synthesis of triglycerides, wax esters, cholesterol esters, and phospholipids. Recent studies have shown that SCD1, the main SCD isoform expressed in liver, is a key player in the regulation of lipid metabolism. SCD1 deficient mice have increased energy expenditure, reduced body adiposity, increased insulin sensitivity and are resistant to diet-induced obesity and liver steatosis. SCD1 was found to be specifically repressed during leptin-mediated weight loss and leptin-deficient ob/ob mice lacking SCD1 showed markedly reduced adiposity, despite higher food intake. In addition, SCD1 deficiency completely corrects the hypometabolic phenotype and hepatic steatosis of ob/ob mice, and attenuates fasting-induced liver steatosis in peroxisome proliferator-activated receptor-α–deficient mice. Consequently, increased SCD activity has been found in humans and animals which accumulate significant amounts of lipids in liver, whereas SCD1 deficiency ameliorates both high-fat diet induced and genetically induced hepatic steatosis. Much evidence indicates that the direct anti-steatotic effect of SCD1 deficiency stems from increased fatty acid oxidation and reduced lipid synthesis. The most recent study showed that hepatic SCD1 expression is required for carbohydrate-induced adiposity. Using a mouse model with a liver-specific knockout of SCD1 (LKO), it has been established that LK0 mice were protected from high-carbohydrate but not high-fat diet-induced hepatic steatosis, suggesting that SCD1 inhibition in extrahepatic tissues is necessary to protect mice from lipid-induced obesity and fatty liver. Taken together, all these findings indicate that SCD plays a significant role in the development of hepatic steatosis and that therapeutic manipulation of SCD might be of benefit in non-alcoholic fatty liver disease.

The major focus for dietary prevention of obesity and diabetes is on increasing the satiating power and thermogenic effects of the diet. Many popular diets (e.g. Atkins, Zone, South Beach) seem to have found a possible solution by increasing the protein content to more than is normally recommended. Many national dietary guidelines have recommended that only 10–20% of calorie content should stem from protein, whereas 30–40% of the calorie content in the aforementioned diets stems from protein, at the expense of carbohydrates. Newer research indicates that the high protein content may be the reason for their partial success in inducing weight loss without restricting total calories. We have shown that diets with higher protein contents are more satiating and thermogenic, and produce more weight loss than a higher carbohydrate diet in ad libitum conditions. Diets with fat content fixed at 30% of calories produced more weight loss when high in protein (25% of calories) than when normal in protein (12% of calories). Weight loss was 9.4 vs. 5.9 kg in favour of the high-protein diet over 6 months. After 1 year the evidence suggested that protein may reduce visceral fat more than expected from the fat loss. Apart from the beneficial effect of weight loss on insulin sensitivity, an increased protein/carbohydrate ratio may also have a weight loss independent effect. The metabolic mechanisms behind protein’s effects on energy balance are not fully known, but they may partly be due to the increased thermogenic effect and increased hepatic gluconeogenesis promoting satiety. Low-fat dairy products can also contribute to weight loss and maintenance, mainly due to the high protein content, but also due to specific effects of dairy calcium on energy balance. Calcium bind dietary fat in the gut, and increase fecal fat excretion, but calcium might also have a role in the metabolic control of appetite. There is accumulating evidence to support that calcium deficiency during energy restriction has an adverse effect on the chance of weight loss success.
ROLE OF BARIATRIC SURGERY IN MULTIDISCIPLINARY APPROACH TO SEVERE OBESITY

M. Fried1,2
1Clinical Center for Minimally Invasive and Bariatric Surgery ISCARE-Lighthouse, Prague, Czech Republic; 21st Faculty of Medicine, Charles University, Prague, Czech Republic

The prevalence of obesity is increasing world-wide at an alarming rate. In Europe is reported in the range of 10–20% in men and 15–25% in women. Thus almost half of the European population is overweight or obese (BMI > 25). Overweight and obesity play a crucial role in the development of type 2 diabetes, impairs quality of life (QoL) and reduces life expectancy. Mortality attributable to excess weight is a serious public health problem in Europe. Severe obesity with its health and psychosocial consequences substantially increases not only the health costs but also the socioeconomic burden. The only way to tackle obesity is through adoption of comprehensive action. Prevention has an important role, especially in the fields of healthy lifestyle, diet and physical activity. However, treatment of more than 100,000,000 EU adult citizens who are already suffering from obesity is of enormous importance as well. Multi-disciplinary, scientific medical approach to obesity treatment is one of the key long-term success factors, ideally concentrating obesity management to specialized and dedicated centres. There is sufficient variety of obesity treatment modalities available, such as diet, physical activity, psycho-behavioral intervention and drug treatment. However, it is widely accepted that bariatric surgery has proved to be the most (and the only) effective in treatment of morbidly obese patients (BMI > 35). Bariatric surgery (either limiting food intake, or absorption of nutrients and energy) carries low risks and is significantly beneficial not only from dramatic excess weight loss achieved in long-term (approx. 60–80% EWL), however, it substantially improves and/or resolves serious metabolic disorders (such as Type 2 Diabetes, and others) in more than 85% of obese patients. Recent long-term studies show, that there is a substantial reduction in mortality after bariatric surgery, as well as decreased risk of developing new obesity-related co-morbidities, decreased health-care utilization and decreased direct health-care costs.

WHAT TO EAT OR NOT TO EAT? CAN THE “OMICS” TECHNOLOGY GIVE US THE ANSWER?

W.H.M. Saris
Dept. Human Biology, Nutrition Research Institute NUTRIM, Maastricht University, Maastricht, The Netherlands

Since the publication of the sequence of the Human Genome in 2001 a rapid development of the omics technology has taken place. From Transcriptomics of large number of genes in tissues, Proteomics and profiling of the Metabolome in blood or tissue, we understand much better the effects of nutrients on the sequence of events in specific metabolic pathways. In this respect the omics technology has yield already enormous progress in the Nutritional Sciences in the last decade. But with the introduction of the Nutrigenomic science there was also high expectation to come with better biomarkers in particular to detect early changes in metabolism with specific dietary interventions such as in the case of body weight control. So far the results are disappointing since it takes much more time before suggested early biomarkers are accepted in the scientific world. Perhaps the most interesting area of research is the Personalized Nutrition concept. Can we, based on the omics technology, better predict what we need or what is good for our health such as body weight control in term of food and nutrients compare to the traditional nutritional science? So far the genetic profiling on which a personalized advice is given by companies, is not very well based on solid scientific evidence. On the other hand the large scale Whole Genome Scans of thousands of cases and controls gives rapidly a better insight in which genetics variations are important to predict later life disease as well as how to modulate later life risks by changing our diet. In this respect omics technology will certainly contribute to a more personal dietary advice what to eat or not to eat in the near future.
Both overweight and obesity are associated with large consequences for public health. Although obesity has a stronger relation to disease outcome, overweight is even more expensive than is obesity, because of the higher prevalence of overweight. As obesity is more strongly related to morbidity and disability than to mortality, obese subjects have both a reduced life-expectancy, and an increased number of unhealthy life-years. Prevention should become an essential part of chronic disease management approached, when aiming at reducing obesity and its consequences. Portfolios linking prevention and treatment programs should be developed, in which responsibilities for different professionals and transferrals to different professionals are carefully described, based on existing or coming evidence. Individuals will need to be equipped with capacities to take own responsibilities in weight management. Professionals should be equipped with capacities and tools to take care of patients and offer them a chronic disease management approach.

In the next few years, we will need to learn from concerted actions developing chronic disease management protocols in which monitoring of activities and evaluations will be key in our prevention challenges. Prevention is now high on the political and research agenda. It should soon become high on the medical agenda.

Objective: Growth monitoring of children is a basic component of surveillance of the health status of any child population. Collected data are used for the constructing and updating of growth charts, tools essential in preventive care of children. Furthermore, the charts facilitate monitoring of prevalence of overweight and obesity as well as underweight. Child growth is also a sensitive indicator of socio-economic conditions in the society.

Methods: Czech Republic belongs among the countries with long tradition of large anthropological surveys. Since 1951, such surveys have been carried out in regular 10-year intervals. The latest, 6th survey, was done in 2001. Gathered data facilitate monitoring of long-term changes in height, weight and the weight/height ratios. These surveys are complemented by other studies, which have recently focused on prevalence of overweight and obesity.

Results: The results indicate that in the past 60 years important changes have occurred in height, body weight and BMI-for-age among Czech children. In comparison with results from earlier surveys, several phenomena have been observed in the Czech child population: secular trend of increased height, accelerated growth, shift in timing of the adiposity rebound (the time when a child reaches the lowest BMI before his or her BMI gradually begins to increase) to earlier age and an earlier onset of maturation. The most dramatic changes in growth patterns were observed among school-age children, where the BMI values for the 90th and 97th percentile increased while they decreased for the 10th percentile. Yet, our findings indicate that contemporary adolescent girls appear to be thinner than in the past. Growth charts of all body characteristics used in pediatric practice have been updated in 2001. The increased values of BMI have, however, prompted a decision to construct BMI-for-age and weight-for-age charts on basis of the 1991 data. Based on the current data, the prevalence of overweight and obesity among Czech children in the 6–17 year age group does not appear as dramatic (13%) as in some other European countries (19%) and in the USA (32%). Nonetheless, the upward trend is evident.

Conclusions: The results of child growth monitoring are clearly important for pediatric practice. They should, however, also become an important basis for policy decisions that impact on the quality of health care and those that may also influence socio-economic situation of families with children.
Increased understanding of adipose tissue biology in the last years has led to better recognition of mechanisms linking obesity and insulin resistance. One of the key elements in pathogenesis of insulin resistance is the obesity induced chronic, systemic low-grade state of inflammation. Biomarkers of inflammation such as C-reactive protein, TNF-\(\alpha\), Interleukin-6 are increased in obesity and seems to predict the development of type 2 diabetes with complications. It is now obvious that the active participant in generation of inflammatory states is the adipose tissue. Adipocyte secretes a variety of cytokines. Moreover the adipose tissue of obese people is infiltrated with macrophages, which contribute also to the cytokine production. In addition to inflammation and insulin resistance within adipose tissue, the same processes most likely occur in the liver and skeletal muscle. Liver contains a large amount of tissue-resident macrophages (Kupffer cells) which could play a role in hepatic insulin resistance. Although the connection between inflammation and insulin signaling in myocytes is poorly understood, the probability of macrophage mediated skeletal muscle insulin resistance exists. On the other hand, little attention has been paid to cytokine inhibitory molecules. If obesity could induce inflammation, the inflammatory reaction in the reactive phase could also induce anti-inflammatory molecules like IL-1Ra and IL-10 as part of a host-defense mechanism. It remains to be clarified what is the order of triggering events, which tissue(s) or tissue cell types are primarily involved in this processes and also whether these primary events are of metabolic or inflammatory origin. In this review I shall focus on the role of initiating factors of the inflammation and anti-inflammation response not only in the obesity induced insulin resistance, but also in hormone driven changes of increased adipose tissue content in humans. The role of different adipose tissue depots in the development of inflammation will be also discussed.

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Adipose tissue is a storage site for persistent organic pollutants (POPs), like polychlorinated biphenyls, polychlorinated pesticides, insecticides, dioxins and dibenzofurans, which, because of their lipophilicity, and resistance to biological and chemical degradation, impart persistency and propensity to bioaccumulate in it. The main source of human exposition by POPs is food, especially fatty fish, meat and milk products. Concentration of different POPs congeners in adipose tissue, which can range over several orders of magnitude, and interactions among different classes of POPs compounds, frequently with opposing effects, complicate hazard evaluation and risk assessment of factual complex mixtures present in adipose tissue. However POPs may crossroad or modulate the effect of endogenous ligands of nuclear transcription factors, participating in differentiation, metabolism and the secretory function of adipocytes. These mechanisms include, most importantly: (i) endocrine disrupting potency of POPs' mixtures on androgen, estrogen or thyroid hormone metabolism/functions in WAT, (ii) interference of dioxin-like chemicals with retinoic acid homeostasis, where there is supposed impact on retinoids receptors and (iii) interaction with transcriptional activity of peroxisome proliferator-activated receptors. Thus, the accumulation and action of POPs in WAT represents a unitary mechanism explaining, at least in part, the effects of POPs in whole organism. By modulating WAT differentiation, metabolism and function, the POPs could affect not only the physiological role of WAT but they may also influence the development of obesity-associated diseases. Review of recent knowledge of POPs possible effects in adipose tissue as well as results of proper studies considering POPs association with secretory functions of adipose tissue will be presented.
Brown adipose tissue, long thought to be of significance only for body temperature control in newborn babies and to be without significance for adult man, has now re-emerged as a putative factor in human weight control. The heat production derives from the activity of uncoupling protein 1 (UCP1) in the mitochondria of brown adipose tissue. Classically, this adaptive heat production is of importance for the comfortable acclimation of small mammals to cold environments, i.e. nonshivering thermogenesis can develop to replace shivering. In rodents, it is now evident that loss of thermogenic activity in brown fat can influence energy balance such that obesity develops, contrary to general concepts that decreased food intake should compensate for decreased energy expenditure. Obesity development due to inactivity of brown fat is dependent upon the mice being housed at thermoneutrality. This temperature regime is comparable to that normally experienced by adult man. In adult man, the thermogenic activity of UCP1 has, however, not been considered to be of importance because of an accepted absence of brown fat in adults. Although minor amounts of UCP1 have been detected in various white fat depots in adults, these have not been believed to be quantitatively important. Recent reports from MRI studies of labelled glucose uptake demonstrate, however, that indeed adult man possesses not insignificant depots of brown fat. These depots are not found in quite the same areas as in rodents and this may be a reason for the earlier oversights. It thus appears reasonable to anticipate that indeed in adult man varying amounts of brown fat and UCP1 can influence energy balance to a greater extent than has until now been supposed and that the amount and activity of brown fat and UCP1 may be open to pharmacological intervention.


(1) Beyond the proper balance between macronutrients necessary to maintain healthy feeding the proportion of the chemical components within a single macronutrient counts also for healthy nutrition. A good example is the ratio between saturated and poly-unsaturated fatty acids (PUFAs) in the nutrients containing lipids. If the optimal ratio does not fit the healthy requirements during early development metabolic misimprinting may occur. Supplementation of n-3 PUFAs (fish oil) in the food of pregnant rats during pregnancy and lactation leads to a lean body composition in young adult age of offspring and improves blood lipid profile and metabolic hormone levels first of all those of insulin and leptin, and enhances insulin sensitivity. Contrary, even a relatively moderate deficit in n-3 and n-6 PUFAs during development results in opposite tendencies, i.e. sustained and increased body weight gain and abdominal fat deposition, a decreased glucose tolerance and a diminished leptin sensitivity suppressing food intake. Metabolic imprinting, therefore, may well be a useful research field to understand environmental risk factors for childhood obesity.

(2) The overbalance of body weight regulation leading to obesity depends not only on the amount and nature of macronutrient consumed but also on the genetically or epigenetically inherited regulatory set-points of fuel metabolism. Mice selectively-bred for high wheel-running activity are resistant to high-fat feeding and do not evolve the signs of metabolic syndrome and overweight, which are clearly present in control animals subjected to high-fat food. Metabolic properties making the organism resistant to high-fat food are worth to survey, since it highlights the way to prevent and treat obesity.

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Objective and Methods: Weight reduction induced by hypocaloric diet promotes a marked improvement of metabolic profile of obese subjects. The candidate mechanisms that link the weight reduction and/or negative energy balance to improvements of metabolic profile, namely increase of insulin sensitivity, are only partly understood. Diet-induced modifications in plasma non-esterified fatty acids (determined mainly by the rate of adipose tissue lipolysis) and modifications of levels of metabolically active adipokines figure among the most frequently suggested mechanisms.

Results: The hypocaloric diet is associated with modifications of the regulation of lipolysis in adipose tissue (AT): this concerns the adrenoceptor-mediated as well as atrial natriuretic peptide-regulated pathways. Consequently, the AT expression of the target lipolysis-regulating enzyme, hormone-sensitive-lipase, is modified. Hypocaloric diet-induced weight reduction is associated with changes in expression of several metabolically active adipokines, although the results are not unequivocal. The pattern of changes of adipokine expression during the time-course of the diet-induced weight reduction is clearly different from those of the whole-body insulin sensitivity. While insulin sensitivity is steadily increasing during the dietary program, the modification of adipokine expression is different during the initial phase of severe calorie restriction when compared to a subsequent weight maintenance phase. Mechanism that underlie this differential response of adipokine expression in AT are to be suggested: a differential infiltration of macrophages in AT during the respective dietary phases may be a potential candidate.

Conclusion: The diet-induced weight reduction is associated with changes in metabolism and endocrine function of AT. Understanding of the underlying mechanisms may provide a pathway toward a rational strategy of treatment of obesity-related disorders.

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IN VIVO BIOACTIVITY OF DIETARY POLYPHENOLS

J. Keijer1, V. de Boer1, E. van Schothorst1, P. Hollman2
1Human and Animal Physiology, Wageningen University; RIKILT-Institute of Food Safety, Wageningen, The Netherlands

Objective: Identification of in vivo effects of dietary polyphenols. Background: The polyphenol quercetin is associated with reduced cardiovascular risk and, to a smaller extent, reduced lung cancer risk. In vitro studies have shown a wide spectre of effects, including activation of the metabolic regulator SIRT1. However, most studies were carried out with unmetabolized quercetin, which does not circulate in the body and has a different bioactivity.

Methods: To identify in vivo relevant effects of quercetin, we have 1) tested SIRT1 activation for physiological relevance, 2) identified target tissues and relevant metabolites and 3) applied genomics approaches to identify effects in vivo.

Results: We show that quercetin cannot activate the metabolic regulator SIRT1 in vivo and that this is most likely due to its metabolism, since the major metabolite quercetin-3-glucuronide cannot stimulate SIRT1 in vitro. In a rat feeding study, we identified lung and testis as the primary target tissues of quercetin. Using whole genome arrays, in lung tissue we identified small but consistent effects of dietary quercetin on lipid catabolism. Quercetin was also found to lower plasma free fatty acid levels.

Conclusions: Metabolism affects bioactivity of dietary polyphenols, hampering interpretation of in vitro results obtained with quercetin aglycone. Dietary polyphenols affect lipid metabolism in vivo.
Among the factors influencing weight loss and its maintenance, psycho-behavioral, nutritional, metabolic, hormonal and hereditary predictors play an important role. Both hormones and psychobehavioral factors are under genetic control. Several studies demonstrated an important contribution of factors (restraint, disinhibition, hunger) of the Eating Inventory (EI) and Beck Depression Inventory to the outcome of weight management. In our 12-month sibutramine trial, the baseline BMI, depression score, restraint score of the EI and total energy intake predicted weight loss at 12 months. These predictive variables accounted for 43.8% of the variance in BMI loss. When relationships between the BMI loss and changes in psychobehavioral and nutritional parameters were considered after 12 months of treatment, a drop in the disinhibition score of the EI appeared the only significant factor affecting the BMI decrease. This association of the sibutramine-induced weight loss with a decrease in disinhibition score may contribute to the improvement of cardiometabolic risks. Our recent studies demonstrated a strong relationship between the dietary disinhibition and abdominal obesity and cardiometabolic risks. An outcome of the short-term weight reducing treatment is improvement of cardiometabolic risks. Our recent studies demonstrated a strong relationship between the dietary disinhibition and abdominal obesity and cardiometabolic risks. Among the factors influencing weight loss and its maintenance, psycho-behavioral, nutritional, metabolic, hormonal and hereditary predictors play an important role. Both hormones and psychobehavioral factors are under genetic control. Several studies demonstrated an important contribution of factors (restraint, disinhibition, hunger) of the Eating Inventory (EI) and Beck Depression Inventory to the outcome of weight management. In our 12-month sibutramine trial, the baseline BMI, depression score, restraint score of the EI and total energy intake predicted weight loss at 12 months. These predictive variables accounted for 43.8% of the variance in BMI loss. When relationships between the BMI loss and changes in psychobehavioral and nutritional parameters were considered after 12 months of treatment, a drop in the disinhibition score of the EI appeared the only significant factor affecting the BMI decrease. This association of the sibutramine-induced weight loss with a decrease in disinhibition score may contribute to the improvement of cardiometabolic risks. Our recent studies demonstrated a strong relationship between the dietary disinhibition and abdominal obesity and cardiometabolic risks. An outcome of the short-term weight reducing treatment is mainly affected by a change in energy and nutrient intake and physical activity and thus the impact of other factors is usually suppressed. In order to reveal hormonal determinants of weight loss, a 4-week in-patient comprehensive weight reduction program was introduced in which food intake and physical activity were under the strict control. Correlation analysis revealed that baseline concentrations of several hormones were significantly associated either with a higher (free T3, C-peptide, GH, PP) or with a lower (IGF-I, cortisol, adiponectin, NPY) reduction of anthropometric parameters in response to weight management. In the backward stepwise regression model, age and initial BMI together with baseline levels of GH, PPY, NPY and C-reactive protein predicted 49.8% of variability in weight loss. On the other hand, psychobehavioral factors as items of the EI and Beck depression score did not contribute to weight change induced by a well-controlled short-term weight reduction program. It is concluded that both psychobehavioral factors and hormones should be considered as important determinants of weight loss.

Obesity and overweight are highly and increasingly prevalent chronic conditions worldwide. Recently published guidelines recommend that drug treatment be considered as adjunctive therapy in patients with a body mass index 30 or 27–29.9 kg/m² with medically complicated obesity. The three drugs approved for the long term treatment of obesity are orlistat, a gastrointestinal lipase inhibitor, sibutramine, a centrally acting monoamine reuptake inhibitor, and rimonabant, an endocannabinoid receptor antagonist. A recent review identified 10 long term (>1 year) studies with sibutramine (7 weight loss and 3 weight maintenance trials). Patients receiving sibutramine lost 4.2 kg (3.6 kg to 4.7 kg; eight studies) or 4.3% (3.7% to 5.0%; 10 studies) more weight than those taking placebo. Compared with placebo, sibutramine increased systolic blood pressure by 1.7 mm Hg (0.1 mm Hg to 3.3 mm Hg; seven studies), diastolic blood pressure by 2.4 mm Hg (1.5 mm Hg to 3.3 mm Hg; seven studies), and pulse rate by 4.5 beats/min (3.5 beats/min to 5.6 beats/min; seven studies). The Hypertension-Obesity-Sibutramine (HOS) Study included 171 obese hypertensive patients. After a 2-week run-in period, patients receiving 1 of the 3 antihypertensive combination therapies (felodipine/ ramipril, verapamil/ trandolapril or metoprolol/ hydrochlorothiazide) were assigned randomly to sibutramine (15 mg) or placebo. Office SBP and DBP changes from baseline did not differ significantly between the sibutramine and placebo groups. In the 24-hour blood pressure analysis, SBP was lower in both groups, whereas DBP was increased in the sibutramine group compared with placebo (SBP = −0.3 ± 1.1 versus −0.9 ± 1.2 mm Hg, P = 0.6936; DBP 2.1 ± 0.8 versus −0.3 ± 0.8 mm Hg, P = 0.0403). Comparison of changes in blood pressure responses by sibutramine and placebo in the 3 cohorts did not reveal statistically significant differences. A neutral effect on both systolic and diastolic blood pressure was observed in a weight loss study including 30 obese patients treated with sibutramine 10 mg for 6 months in our center (baseline vs. end of study: SBP 124.6 ± 15.3 vs. 121.5 ± 14.8, DBP 78.8 ± 11.7 vs. 76.5 ± 11.6 mmHg, P = NS). Conclusions: The observed increase in blood pressure and heart rate with sibutramine are of potential concern, although not confirmed by all studies, and blood pressure should be monitored during treatment.
OBESITY TREATMENT AND CARDIOVASCULAR RISKS OF OBESE PATIENTS

Š. Svačina
Charles University, 1st Medical Faculty, Prague, Czech Republic

Treating obesity it is necessary to treat all cardiovascular risk factors. The combination of obesity and diabetes presents the highest cardiovascular risk. Therefore, it is very important to prevent and to treat diabetes related risks (for instance using bariatric surgery). Controversial situation is in lipids. Simple weight loss and orlistat treatment have only limited effect on lipids. Sibutramine in monotherapy has positive effect on lipids increasing HDL cholesterol and decreasing triglycerides in most studies. Today many obese patients are using statin and the sibutramine statin interaction in the effect on therapy was not evaluated yet. The aim of our study was to evaluate effect of 15 mg sibutramine on lipid level in 44 obese patients – mean age 50.8 years, mean BMI 37.2 kg/m², mean weight loss –6.7 kg/3 months. 18 patients continued the stable statin dose combined with new sibutramine therapy. 26 newly sibutramine treated patients had no hypolipidemic therapy. We are evaluating the first 3 months of sibutramine therapy using paired Wilcoxon nonparametric test.

Results: Lipid levels changed in the following way: cholesterol 5.18→4.96 mmol/l (p = 0.02), LDL cholesterol 2.98→2.90 mmol/l (p = 0.29), HDL cholesterol 1.18→1.25 mmol/l (p = 0.001), triglycerides 1.89→1.69 mmol/l (p = 0.04). Comparing both groups there was no significant difference in statin treated and untreated patients. Weight decreased by 6.7 kg in all patients. There was a lower weight decrease in statin treated patients –4.3kg vs. –8.6kg in only sibutramine treated patients (p = 0.001). No significant differences in blood pressure and heart rate between groups were detected. Sibutramine effectively decreases triglycerides and total cholesterol level and increases HDL cholesterol level in 3 month therapy. The effect is the same in statin treated patients. It is useful to use sibutramine effect on lipids even in obese patients with established statin therapy. If really statin treated patients lose less weight has to be confirmed in a next study. Conclusion: Complex intervention of cardiovascular risk factors is possible in obese patients especially using sibutramine therapy.

OBESITY MANAGEMENT

H. Toplak
Department of Internal Medicine, Medical University Graz, Graz, Austria

Objective: Outline the clinical skills in exerting behavioral changes including lifestyle approaches in obese patients.

Methods Used: The patients attending obesity clinics are rarely easy to treat. In normal clinics nutritional advice is given together with some suggestions for lifestyle changes including “increase in exercise” which is somehow accepted by the patient but does not lead to substantial lifestyle changes as needed for a major treatment success. We therefore critically evaluate our patients following psychosocial models (holistic approach). We carefully ask for present behavior including eating, drinking, motivation of eating and social aspects of eating like place and influence form the family. At least 3–4 questions covering possible symptoms of underlying and not overt depression are asked. Whenever there is any doubt depression scales and questionnaires are used for further examination. If a major depression is diagnosed patients receive antidepressive medication without potential of weight gain before obesity treatment is started. Minor depression or mood disturbances and patients with carbohydrate craving and binge eating might be properly treated by sibutramine. Craving can also be treated with rimonabant which considerably improves metabolic results also. Meal replacement strategies can be used in either regimen, especially in women, where protein content of the meals used is normally low.

Results: Introducing behavioral aspects has improved results considerably. Our data show that patients have to be seen at least monthly to maintain weight loss results. People learn why and how they eat what and obtain more control through better understanding and avoiding of critical situations. Drugs improve results, especially when used on the long term. It has to be stated that people expect from obesity drugs that they make the job without lifestyle modification and in a short period of time. Both is not true. Drugs on top help and are better on the long term, better for weight maintenance than for weight loss itself.

In Conclusion, obesity management has changed to a complex treatment process in group or individual treatment and has to be individualized, even when performed in patient groups. Behavioral and concrete lifestyle changes set the basis for a success which can be further improved by meal replacement and the use of weight loss drugs. Underlying psychiatric disease has to be detected before start of treatment and treatment has to be started prior any intervention to at least give some chance for success.
Background: Biliopancreatic Diversion/Duodenal Switch (BPD/DS) is rarely used in the East and Central Europe. Although its effectiveness for the treatment of morbid and super obesity is clear, its availability for the less than morbidly obese patients is discussible. Acceptance of BPD/DS for treating Diabetes mellitus type 2 (DM2) and/or dyslipidemias independently on initial weight is attractive.

Material and Methods: Series of 187 open BPD/DS is presented. Patient’s initial weight was 136.2 ± 24.0 (94–207) kg, mean BMI – 47.8 ± 7.3 (35.3–71.7) kg/m ². 25 of them had BMI <40 kg/m ², 103 – BMI- 40–49.9 kg/m², 59 -BMI> 50 kg/m². 40 patients in the total group suffered from Diabetes mellitus type 2.

Results: Mortality was zero. Major early complication rate is 5.3% (wound infection–5, duodenal stamp leakage–1, rhabdomyolisis, acute renal failure–1, duodenoileal anastomositis–1, haemoperitoneum–1, perigastric abscess –1). Late complications were: small bowel obstruction -3.2%, clinically significant protein malnutrition -1.1%, incisional hernias- 11.8%, verified urolithiasis – 2.5%. Mean excess weight loss (EWL) at 2 years was 75.6 ± 16.6%. All patients with DM2 were normoglycemic soon after BPD/DS and had normal HbA1C after 6 months. Total cholesterol has become normal in all patients. BPD/DS was evidently effective in the 6 patients with bulimia nervosa. EWL depended on initial BMI, but no patients have reached BMI below normal ranges.

Conclusions: BPD/DS may be recommended as rather safe operation providing excellent weight loss, resolution of DM2 and other positive metabolic effects. BPD/DS appeared to be acceptable in every BMI groups including patients with BMI 35–40 kg/m² with metabolic syndrome and/or uncontrollable eating behavior. Degree of gastric restriction and malabsorption may be varied depending on initial BMI. Careful follow-up control is absolutely necessary after BPD/DS.

Conservative treatment has been shown in long-term studies to be ineffective in morbid obesity. Surgical treatments break down into restrictive, malabsorptive, combined restrictive and malabsorptive or motility-reducing procedures. Laparoscopic implantation of an adjustable gastric band is an efficient restrictive measure for treating the majority of patients with this condition. The adjustable gastric band enables weight loss and food intake to be adapted to the individual patient’s need. Eighty percent to 90% of these patients can expect to lose 55–70% of their excess weight. Vertical banded gastroplasty is losing ground among the restrictive options. Preliminary experiences are encouraging but the long term results are disappointing when assessed by the standard criteria. Gastric Sleeve Resection is becoming very popular in Europe due to excellent short term results. Gastric bypass is gaining ground in Europe and a standard procedure in USA. This operation is estimated to give 70–80% excess weight loss and provide better quality of life than restrictive procedures. The biliopancreatic diversion with duodenal switch combines a sleeve gastrectomy with a duodenoileal switch to achieve maximum weight loss. Consistent excess weight loss between 70% and 80% is achieved with acceptable decreased long-term nutritional complications. The laparoscopic approach to this procedure has successfully created a surgical technique with optimum benefit and minimal morbidity, especially in the super obese patient. Intra-gastric stimulation is the least invasive surgical procedure at present. However, the excess weight loss is lowest with this method at only 32% in the first two years after the operation. Provided safety recommendations are observed, laparoscopic operations for obesity are fairly low-risk. The mortality rate in centres with experienced staff is less than 0.3%. Currently, surgery offers the only viable treatment option with long term weight loss and maintenance for the morbidly obese. There is no one operation that is effective for all patients.
Vascular endothelium is a metabolically active tissue, serving as a source of multiple factors that are critical for normal homeostasis. These include growth stimulators and inhibitors, vasoconstrictors and vasodilators, various pro- and anti-thrombotic factors, fibrinolytic activators and inhibitors, potent arachidonate metabolites, leukocyte adhesion molecules and multiple cytokines. It is a vital organ whose health is essential to normal vascular physiology and whose dysfunction can be a critical factor in the pathogenesis of vascular disease. Adipose tissue (especially abdominal) secretes a variety of hormones (adipokines) that can modulate endothelial function. Abdominal obesity is often connected with insulin resistance, which is thought to underlie the metabolic syndrome. Insulin resistance (IR) is closely related to endothelial dysfunction (ED). IR seems to be an intrinsic factor of endotelopathy. Glucotoxicity (caused by hyperglycemia), lipotoxicity (elevated levels of FFA, observed in insulin-resistant states including diabetes, obesity and dyslipidemias) and arterial hypertension are thought to be the extrinsic factors of endothelopathy. ED contributes to cardiovascular diseases, including atherosclerosis and coronary artery disease, which are also characterized by IR and these cardiovascular diseases are associated with increased circulating levels of inflammatory markers. Atherogenesis seems to be a more complex mechanism. In obesity, metabolic syndrome, diabetes, dyslipidemias and cardiovascular diseases, multiple pathogenetic stressors simultaneously cause IR in metabolic tissues and ED in vascular tissues. Therefore the reason of the association of metabolic and cardiovascular diseases may be that multiple stressors independently cause IR and ED. Microalbuminuria, a marker of angiopathy, which correlates with ED, may be the best measurable risk factor in everyday praxis. Therapeutic interventions demonstrate that improving endothelial function ameliorates IR and improving insulin sensitivity ameliorates ED. Lifestyle modifications including hypocaloric diet with weight loss and physical exercise decrease IR and improve ED. This must be the first line therapy in every case. Pharmacological interventions must be oriented to agents that improve insulin sensitivity (thiazolidindiones, metformin) and to agents that improve endothelial function (ACE inhibitors, ARBs, statins, fibrates). Potential effects on ED may have also anti-obesity treatment, some studies oriented to cardiovascular outcome of anti-obesity treatment are ongoing.

Over the last ten years, the genetic analysis of obesity led to the identification of confirmed major genes. While such major genes have a clear influence on the development of the phenotype, they are however rare and thus of minor clinical importance. Polygenic effects concern a clearly larger number of affected subjects; the variants are also found in healthy individuals. Therefore, a polygene can only be identified and validated by statistical analyses: the appropriate gene variant (allele) occurs more frequently in affected than in healthy subjects. Each single polygene has only a small contribution to the development of the respective phenotype. The first truly validated polygenic variant with an influence on body weight pertains to the V103I polymorphism in the melanocortin-4 receptor gene (Geller et al., Am J Hum Genetics 2004). The I103 allele leads to a mean BMI reduction in the magnitude of 0.5 kg/m². Genome wide association studies (GWA) have made it possible to for the first time detect polygenes underlying complex disorders on a large scaled basis. The FTO (fat mass and obesity associated) gene was found to be associated with obesity as based on a GWA; statistical adjustment for BMI revealed that this association actually reflects an association with obesity (Frayling et al., Science 2007). This finding has subsequently been replicated in large independent study groups. In the first genome wide association study for obesity, which was based on obese children and adolescents and lean adult controls a FTO SNP was significantly associated with obesity after correction for multiple testing (Hinney et al., PLoS One 2007). Mean BMI increases by 1.2 kg per allele. Recently a variant downstream of the melanocortin-4 receptor gene was also identified as having an influence on body weight; the mean effect of a single allele corresponds to +0.22 kg/m² (Loos et al., Nature Genetics 2008).
**DIFFERENCES IN BMI AND RELATIVE BODY FAT OF HUNGARIAN SCHOOLCHILDREN: 1980–2005**

J. Mészáros, Zs. Mészáros, B.M. Szmodis, M. Uvacsek, F. Ihász, M. Zsidegh

Department of Health Sciences and Sports Medicine, Faculty of Physical Education and Sport Sciences, Semmelweis University, Budapest, Hungary

**Objective:** The prevalence of juvenile excess weight keeps growing in the more developed world. The aim of the study was to compare the prevalence of over-weight and obesity among Hungarian schoolboys in 1980 and 2005.

**Methods:** Two representative anthropometric data collections were carried out in volunteer non-athletic schoolboys aged between 6.51 and 18.50 years in the same 90 settlements of the country in 1980 (n = 13,061) and 2005 (n = 13,060). Height, body mass and five skinfolds (biceps, triceps, subscapular, suprailiac and calf) were measured by the same investigators in both data collections. The categories of overweight and obesity were determined by using the suggestions of Cole and associates (2000) and Lohman (1992). Between samples differences were compared by khi²-tests.

**Results:** The pair-wise differences between height means were consistently significant in the studied 12 age groups. Body mass differences were not exactly proportionate with height. The boys of 2005 had significantly greater BMI and more relative body fat than those of 1980. The prevalence of overweight and obesity was significantly higher in 2005. The frequency increase of obese children and adolescents exceeded that of overweight ones.

**Conclusions:** The marked differences in BMI and fat content that had occurred during these 25 years are an indirect evidence for how severely the average physical condition had declined, respectively how the health risks of the respective middle socio-economic layers of children had increased. If one relies on Bouchard’s norms (2000), the Hungarian children’s classification of being over-weight when combined with their only fair level of cardio-respiratory performance points to a higher cardiovascular risk than the simple arithmetic sum of two risky states. Dollman and associates (1999) have also inferred that in the first decades of intense economic development the physical activity and cardio-respiratory performance of children usually decreases, and is replaced largely by electronic and screen-based entertainment. After a general improvement of economic conditions this trend becomes reversed in most countries. In view of the observed changes in body fat and physical performance, respectively of the associated higher risks one can but wonder how long it will take until this trend would get reversed in Hungary.

**IN SCHOOL SNACKING AND BREAKFAST CONSUMPTION OF IRANIAN NORMAL AND OVERWEIGHT HIGH SCHOOL GIRLS**

M. Maddah

Department of Human Nutrition. School of Public Health. Guilan University of Medical Sciences. Rasht, Iran

**Objective:** To investigate the relationship of snacking during school hours and breakfast consumption by weight status of Iranian high school girls in urban and rural areas in Guilan Province, Iran. Method: Representative sample of 2302 school girls (1106 in Rasht City and 1196 in rural areas) selected by multi-stage cluster sampling. Data on breakfast skipping, snacking habits at school, sleeping time, body weight and height were collected by self-administered questionnaire and body weight and height were measured. Differences in the frequency of the measured variables between the urban and rural girls and overweight and normal weight girls were tested using Chi Square test, P < 0.05.

**Results:** The overall prevalence of overweight/obesity was relatively lower in urban areas (22.0% (19.2–25.4) than the rural areas 23.8% (19.8–26.3) p < 0.05). Skipping breakfast was common among both urban (55.5%) and rural (52.3%) girls. Prevalence of overweight/obesity was significantly higher in those skipped breakfast than others. Consumption of junk foods as snack during school day, especially in rural areas was notable in this population. The school girls in rural areas obtained junk foods from school buffets more frequently than the urban school girls (82.2% vs. 59.6% p < 0.0001).

**Conclusion:** The school environment may contribute to the high prevalence of overweight/obesity observed among Iranian adolescent females. Students should be encouraged to eat breakfast and choose nutritious snacks during the school day.
**INCREASING FRUIT AND VEGETABLE CONSUMPTION IN PRIMARY SCHOOLS**

V.A. Kovacs, O. Nagy, J. Schmidt, Gy. Arato, A. Rozsa Danielne, E. Martos
National Institute for Food and Nutrition Science, Budapest, Hungary

**Objective:** Regular consumption of fruits and vegetables (FV) may be protective against obesity and other chronic diseases. On the other hand, previous observational studies demonstrated inadequate FV intake among children. The ‘Healthy might be Tasty’ campaign was designed to increase nutritional knowledge and FV consumption in primary school children. The campaign also aimed to determine the most effective approach by comparing three different types of intervention.

**Methods:** 750 fifth grade children (mean age 12 yrs) from 15 primary schools were recruited for the 2-months long program. The participants were divided into three groups: (1) Education only – E, (2) Education and apple-providing vending machines (0.1 Euro per apple) – E + VM, and (3) Education and free availability of FV as a snack – E + Free FV. At baseline and after the program, all children filled out questionnaires about nutritional knowledge, and about FV consumption habits (based on the questionnaire used in the ProChildren Study).

**Results:** At baseline, only one third (33%) of the participants knew the amount of sufficient daily FV intake. On the effect of education, the number of correct answers increased up to 55%. There was no significant difference in nutritional knowledge improvement between the 3 groups. FV consumption increased significantly after the program. The increment was 0.42 in the mean number of serving per day for fruit (1.53 ± 1.05 vs. 1.95 ± 1.3, p < 0.0001) and 0.2 for vegetable (1.46 ± 1.05 vs. 1.66 ± 1.12, p < 0.005). In addition, we found significant group differences in the magnitude of changes: net increase of FV intake in group E was 39 gr/day, in group E + VM was 84 gr/day, and in group E + free FV was 103 gr/day.

**Conclusions:** Providing free availability of FV together with education seems to be the most effective approach in improving nutritional knowledge and increasing FV intake in children. The ‘Healthy might be Tasty’ program could provide guidance for upcoming FV promotion strategies.

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**WHO LOOKS FAT? ARE PERFECTIONISM AND GENDER CORRELATED WITH CONCEPTS OF THE IDEAL BODY SIZE?**

F.P.V. Lin¹, C. Chew², S.K.R. Ng³
¹Dept of Psychological Studies, Nanyang Technological University, Singapore; ²Dept of Sports Sci & Phy Edu, the Chinese University of Hong Kong, Hong Kong; ³Phy Edu Section, the Hong Kong Polytechnic University, Hong Kong

**Objective:** The purpose of this study is to examine the relationships between perfectionism and gender and concepts of ideal body size. Specifically, the present study sought to assess if: a) perfectionism was correlated with higher ideals in terms of body size; b) perfectionism was correlated with lower Body Mass Indices (BMI); c) both genders’ concepts of the ideal body size for females was different from their concepts of the ideal body size for males.

**Methods:** Eighty-nine Singaporean undergraduate and postgraduate students completed questionnaires which tapped into the different variables of interest (perfectionism was measured using Frost’s Multidimensional Perfectionism Scale). These students either completed the questionnaires during class or were approached to complete the questionnaires whilst they were in the canteen. All participation was voluntary. Data were analyzed using SPSS (version 15.0) employing Analysis of Variance (ANOVA), correlational methods, and regression methods.

**Results:** The results showed that a) global perfectionism was not correlated with higher ideals in terms of body size [however, slight relationships were noted between the different subscales of perfectionism and ideal body size]; b) perfectionism was not correlated with lower BMI; and c) both genders’ concepts of the ideal body size for females was smaller than their concepts of the ideal body size for males.

**Conclusions:** Global perfectionism was not found to be correlated with higher ideals. This is believed to be due to the fact that societal perceptions of ideals in terms of body size have impacted the individuals’ own perceptions of the ideal body size, resulting in a rather uniform ideal. Perfectionism was also not correlated with lower BMI, this is believed to be because there was not enough variance in BMI in the current sample. The finding that the ideal body size for females as perceived by both males and females was smaller than their concepts of the ideal body size for males suggests that traditional concepts of attractiveness for males and females are still held by the sample today.
FIT FOR THE FUTURE – A PRIMARY CARE OBESITY PROGRAMME: COMPLEX PATIENTS AND THEIR OUTCOMES

H. Gibbs, N. McLean
Cambridgeshire Community Services, Nutrition & Dietetic Department, Ida Darwin, Fulbourn CB215EE, United Kingdom

Objective: To compare the degree of obesity and co-morbidities in patients seen in Fit for the Future (FFF), a primary care run weight management programme against the cut-offs described for primary care and specialist obesity management in the National Institute of Clinical Excellence (NICE, 2006) guidelines on obesity management.

Methods: An audit of patients in the FFF programme (n = 183) was undertaken looking at BMI, co-morbid conditions, motivation and demographics. These were compared against the standards suggested by NICE (2006).

Results: The typical patient seen in the FFF programme was BMI 37.6 (95% CI 36.7 to 38.6) and had on average 1.7 co-morbidities (95% CI 1.5 to 1.9). There were some trends within the data showing that younger, lower BMI individuals were more motivated when questioned at the beginning of the programme. According to the NICE guidance these patients should be considered for pharmacotherapy and referral to specialist services. Given that the typical patient in FFF is complex enough to be considered for specialist support, the mean weight loss of 2.43 kg (95% CI 1.17 to 3.70 kg) in 12 weeks for those completed the programme (n = 83), and that 28% of these achieved at least a 5% weight reduction are commendable outcomes.

Conclusions: Patients on our FFF programme are more obese and more ill than would be recommended by NICE guidance for primary care intervention. Despite this, practitioners are doing an excellent job and achieving significant weight loss in a substantial group of these patients.


FAT SOLUBLE VITAMINS AS METABOLIC SYNDROME MARKERS

A.-T. McGill1,2, J.M. Stewart2, F.E. Lithander1,3,4, S.D. Poppitt1,3
1Human Nutrition Unit, 2School of Population Health, 3School of Biological Sciences & 4School of Medical Science, University of Auckland, Auckland, New Zealand

Objective: Blood micronutrient levels may be markers of metabolic health. We explored fat soluble vitamins (FatSolVits) and correlates of the International Diabetes Federation metabolic syndrome (MSX).

Methods: Blood tests and anthropometry were taken in a cross-sectional sample of 250 overweight/obese adults and analysed by standard laboratory and statistical (Pearson) methods.

Results: Serum vitamin E (VitE) correlated with age (r = 0.40, p = 0.0001), men (r = 0.13, p = 0.04), MSX (r = 0.16, p = 0.01), triacylglyceride (Trig) & blood pressure (BP) (r = 0.51 & 0.32, both p < 0.0001); vitamin A (VitA), with age & men (r = 0.35 & 0.32, both p < 0.0001), MSX (r = 0.20, p = 0.002), Trig & BP (r = 0.41 & 0.27, both p < 0.0001); vitamin D (VitD), with adiponectin (Adipn) (r = 0.22, p = 0.0006), but inversely with Waist (r = -0.14, p = 0.03); betaCarotene (bCarot), with age (r = 0.19, p = 0.04), women (r = 0.18, p = 0.04), HDL-C (r = 0.27, p = 0.0001), & Adipn (r = 0.30, p < 0.0001) but inversely with MSX (r = -0.18, p = 0.005), Waist (r = -0.36, p = 0.0001), HOMA-IR (r = -0.20, p = 0.003) & CRP (r = -0.28, p < 0.0001). In a subgroup, n = 21 women & 9 men, bCarot in women alone, correlated with Adipn, & its high, medium & low molecular weight oligomers: Adipn (r = 0.51, p = 0.02), HMW (r = 0.52, p = 0.02), MMW (r = 0.41, p = 0.07) & LMW (r = 0.54, p = 0.01).

Conclusions: FatSolVits, with variable antioxidant properties, correlated in different ways with MSX and related factors. BCarot correlated directly with less, and inversely with more, metabolic stress factors. Novel (Adipn, HOMA-IR, CRP) and traditional (Waist, HDL-C, Trig, BP) cardio-metabolic risk factors were included. VitE tended the same way. The converse was seen with VitA & VitE; both correlated with MSX, and traditional risk factors (Trig & BP). In a Westernised food environment, possible explanations involve bCarot as a marker of fruit/vegetable intake (incorporating many carotenoids). A few foods contain BCarot colouring. VitA is naturally plentiful in meat fats. VitE is frequently added to fatty, processed foods as an anti-oxidant preservative. Thus, serum levels of FatSolVits (uncorrected for serum lipids) may be nutritional markers of food quality and quantity in MSX. This study is small and cross-sectional, but these results, together with the failure of anti-oxidant supplements to ameliorate Type II diabetes and cardiovascular disease (advanced MSX), may indicate that FatSolVits in MSX should be studied further.

15CENTRAL EUROPEAN CONGRESS ON OBESITY: FROM NUTRITION TO METABOLIC SYNDROME

ORAL SESSIONS
Objective: Epidemiological and experimental studies have shown a strong correlation between stressful events (nutritional, hormonal or environmental) in early life and the development of adult chronic diseases such as obesity, diabetes and cardiovascular failure. This phenomenon is known as programming. Leptin regulates food intake and energy expenditure. We have shown that leptin administration during lactation programmes the thyroid function and adrenal catecholamines content and secretion, as well as cardiovascular parameters. In this study, we evaluated the effect of hyperleptinaemia during lactation on the insulin sensitivity and hepatic morphology in adult rats.

Methods: Wistar male rats were injected with saline or leptin (8 µg/100 g of body weight, daily, for the first 10 days of life). Rats were weighed during the experimental period. When they were 150 days old, we evaluated the glucose tolerance and the insulin response through glycemia measurement after glucose or insulin i.p. administration. We determined serum leptin, insulin, adiponectin, triglycerides and cholesterol levels by commercial kits. Glycogen content was measured in liver and skeletal muscle. Liver samples were collected for histological analysis.

Results: As expected, the leptin group had lower body weight during treatment (–10%, p < 0.05), but higher body weight (+10%, p < 0.05) and hyperleptinaemia (+78%, p < 0.05) at adulthood. The programmed rats showed hyperinsulinaemia (+32%, p < 0.05), hypoadiponectinaemia (–45%, p < 0.05) and intolerance to the glucose administration (+10%, p < 0.05). Besides, they presented higher liver glycogen (+36%, p < 0.05) and hypertriglyceridaemia (+37%, p < 0.05). We also observed microsteatosis (low grade) around the porta hepatis space and the central lobular regions.

Conclusion: Neonatal hyperleptinaemia programmed for insulin resistance at adulthood even though rats did not present hyperglycemia in basal conditions. Besides, the hypertriglyceridaemia and the hepatic steatosis are highly associated to insulin resistance. The higher liver glycogen content may be a consequence of the hyperleptinaemia, since leptin decreases its degradation in the hepatocytes.

Support: CAPES, CNPq and FAPERJ.

Objective: Leptin is a hormone secreted by adipocytes in proportion to fat stores that plays a major role in regulating energy homeostasis by decreasing food intake and increasing energy expenditure. Leptin stimulates the oxidation of fatty acids and the uptake of glucose and prevents the accumulation of lipids in nonadipose tissue. Rodents with diet-induced obesity and most obese humans are resistant to the effects of leptin. Previous studies demonstrated that leptin modulates the activity of the AMP-activated protein kinase (AMPK) by stimulation of phosphorylation and activation of the alpha2 catalytic subunit of AMPK and that the AMPK is therefore a key regulator of the effect of leptin on food intake and fatty acid oxidation. The aim of the study was to investigate the significance of AMPK for the leptin effect in post-weaning mice using alpha2 AMPK KO mice.

Methods: Male alpha2 AMPK KO mice and B6 mice were fed standard chow, housed one per cage and maintained on 30 °C. Fourteen days after weaning were injected with saline (control) or leptin intraperitoneally (3 mg/kg). Food intake of individually housed mice was assessed per 24 hours period. AMPK and ACC activity was measured in gastrocnemius muscles and plasma leptin levels were determined by RIA kits. The metabolic rate of mice was assessed by indirect calorimetry.

Results: We have demonstrated that leptin decreased respiratory exchange ratio (indicating increased fatty acid oxidation) in B6 mice, however there were no differences in alpha2 AMPK KO mice. We have observed the anorexigenic effect of leptin in B6 mice, but this effect was absent in alpha2 AMPK KO mice. However, alpha2 AMPK KO mice injected with leptin still tended to eat less than alpha2 KO mice injected with saline.

Conclusions: Our results indicate that absence of alpha2 AMPK subunit leads to disruption of signaling pathway for leptin suggesting that alpha2 AMPK subunit is necessary for the effect of leptin.
INTERACTION BETWEEN VISCERAL AND SUBCUTANEOUS FAT AND FATTY ACIDS ON INSULIN SENSITIVITY AND OXIDATIVE METABOLISM IN SKELETAL MUSCLE CELLS

School of Medicine, University of Adelaide, South Australia, Australia

Objective: To determine the effect of intra-abdominal (IAB) and subcutaneous (SC) fat and free fatty acids (FFAs) on energy metabolism in skeletal muscle (L6) cells in an adipose tissue-myotube co-culture system.

Methods: The co-culture system was validated. The effect of adipose tissue-conditioned medium (CM) alone and together with palmitic acid (PA), docosahexaenoic acid (DHA) and linoleic acid (LA) (400 μM) on basal and insulin-stimulated (100 nM) 2-deoxyglucose uptake was determined in L6 cells. L6 cells were cultured for 24 hrs with FFAs in the presence or absence of CM during the last 6 hrs of incubation. mRNA expression of PGC-1α, AMPKα1 & α2, SCD1, PDK4, LKB1, SPTLC1 & SPTLC2 was measured by RT-PCR.

Results: In the controls, insulin induced a 1.5-fold increase in glucose uptake, which was reduced by 18% (P < 0.001) in the presence of CM (1:128) from IAB but not from SC fat. Insulin-stimulated glucose uptake was: decreased by 66% (P < 0.0001) with PA in controls and 73% with PA in either CM (P < 0.001), unaffected by DHA and LA alone but reduced by 40–50% when either was combined with PA and/or IAB fat (P < 0.05). In CM from SC fat, DHA partially and LA totally reversed the PA effect. CM from both depots induced a 3-fold increase in AMPKα2 mRNA (P < 0.05). In the presence of either CM, the addition of PA induced a 2-fold increase in SCD1 (P < 0.001) and reduced PGC-1α mRNA by 45% (P < 0.01). LA and DHA increased gene expression in fat oxidative pathways: LA increased PGC-1α mRNA by 35% (P < 0.05); DHA increased AMPKα1 and α2 mRNA by ~75% (P < 0.01) and 85% (P < 0.001) respectively. DHA or LA combined with PA increased AMPKα2 (P < 0.05) and decreased SCD1 mRNA (P < 0.001) in the presence of either CM, suggesting a shift of FFA metabolism towards oxidation.

Conclusions: The adverse effect of CM from IAB fat on insulin sensitivity cannot be explained by changes in the expression of the genes selected even though CM from both depots modified the effects of FFAs on these genes. The effects of inflammatory cytokines from activated immune cells are being explored. DHA and LA increased gene expression in fat oxidative pathways in the presence of either CM and partially reversed the adverse effect of PA, highlighting the importance of dietary fatty acid composition to increase muscle oxidative metabolism as a strategy to increase insulin sensitivity and thus improve diabetes prevention and management.

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SERUM CONCENTRATIONS OF NOVEL METABOLIC REGULATOR FGF-21 IN PATIENTS WITH OBESITY AND TYPE 2 DIABETES MELLITUS: THE INFLUENCE OF VERY LOW CALORIE DIET AND PPAR-α AGONIST TREATMENT

M. Mráz1, M. Bártlová1, D. Haluziková2, Z. Lacinová1, M. Haluzík1
13 Dept. of Medicine, 2Dept. of Sports Medicine, 1 Faculty of Medicine, Charles University, Prague, Czech Republic

Objective: Fibroblast growth factor-21 (FGF-21) is a recently described metabolic regulator produced primarily by the liver that can improve glucose and lipid homeostasis in animal models of obesity and insulin resistance. The aim of our study was to measure serum FGF-21 concentrations in patients with obesity (OB), obesity and type 2 diabetes mellitus (T2DM) and healthy control subjects (C) and to assess whether its levels are affected by short-term hyperinsulinemia (n = 12, 3 hours isoglycemic-hyperinsulinemic clamp), diet intervention (n = 18, 3 weeks of very low calorie diet (VLCD) - 550 kcal/day) and by the 3-months treatment with PPAR-α agonist (fenofibrate, 267 mg/day).

Methods: 25 patients with obesity (BMI 45.0 ± 1.67 kg/m²), 12 patients with obesity and type 2 diabetes mellitus (BMI 36.1 ± 2.24 kg/m²) and 31 healthy normal-weight control subjects (BMI 23.8 ± 0.34 kg/m²) were included into the study. Serum FGF 21 and adiponectin levels were measured by commercial ELISA kits (BioVendor, CZ), serum insulin levels by commercial RIA kit (Cis Bio International, France). Biochemical parameters were measured by standard laboratory methods.

Results: Serum FGF 21 levels were significantly higher in both patients with obesity and type 2 diabetes relative to healthy controls [331 ± 45.2 pg/ml (OB) and 312 ± 49.4 pg/ml (T2DM) vs. 213 ± 24.7 pg/ml (C)], while obese and diabetic groups did not significantly differ. Both 3-hours hyperinsulinemia and 3 weeks of VLCD significantly increased FGF 21 levels. 3 months treatment of diabetic patients with fenofibrate also significantly increased FGF-21 levels (312 ± 49.4 pg/ml vs. 577 ± 64.2 pg/ml). In a combined population of all groups FGF 21 significantly positively correlated with BMI, blood glucose, HOMA index and insulin levels and it was inversely related to adiponectin levels.

Conclusions: We conclude that FGF-21 levels are increased in obesity and type 2 diabetes mellitus despite the presence of insulin resistance in these patients. This increase may represent a contrarregulatory mechanism to compensate for insulin resistance in these patients.
Objective: n-3 polyunsaturated fatty acids, especially eicosapentaenoic acid and docosahexaenoic acid (DHA), exert hypolipidemic effects and prevent development of obesity and insulin resistance in animals fed high-fat diets. We sought to determine whether chemical DHA-derivatives, substituted at the C(2)-position, could exert a higher efficacy as anti-obesity and anti-diabetic agents, compared to DHA.

Methods: C57BL/6 mice were given a corn oil-based high fat (35% weight/weight) diet (cHF), or cHF with 1.5% of lipids replaced with α-methyl DHA ethyl ester (Substance-1), α-ethyl DHA ethyl ester (Substance-2), α,α-di-methyl DHA ethyl ester (Substance-3), or α-thioethyl DHA ethyl ester (Substance-4) for 4 months. We also investigated whether Substance-2 could reverse glucose intolerance in obese cHF-fed mice. Plasma markers of glucose and lipid metabolism, glucose tolerance, tissue morphology, lipid content and gene regulation were characterized.

Results: cHF induced obesity, hyperlipidemia, impairment of glucose homeostasis and adipose tissue inflammation. Except Substance-3, all other substances prevented weight gain and Substance-2 exerted the strongest effect (63% of cHF-controls). Glucose intolerance (area under the curve) was significantly prevented (~67% of cHF) by both Substance-1 and Substance-2. Moreover, Substance-2 lowered fasting glycemia, plasma insulin, triacylglycerols, and nonesterified fatty acids (73, 9, 47, and 81% of cHF-controls, respectively). Substance-2 reduced accumulation of lipids in the liver and skeletal muscle, as well as adipose tissue inflammation associated with obesity. It also reduced obesity and reverted glucose intolerance in the obese mice.

Conclusions: Substance-2 represents a novel compound with a promising potential in the treatment of obesity and associated metabolic disturbances.
Objective: An excess of adipose tissue (AT) leads to obesity-related disorders. Dietary weight loss programs are used to reduce body fat mass and improve insulin sensitivity. However, the role of energy restriction, weight loss or stabilization and of the composition of the diet is poorly understood.

Methods: Obese women followed dietary interventions varying in duration, extent of energy restriction and composition in fat and carbohydrate. At each time point, body composition, plasma parameters and insulin sensitivity were assessed and subcutaneous AT biopsies were performed. Variations in mRNA levels were determined using DNA microarrays and RT-qPCR.

Results: Two ten week hypocaloric diets varying in fat and carbohydrate content induced similar weight loss and changes for most of the biological variables. A thousand genes were regulated by energy restriction. An effect of the fat-to-carbohydrate ratio was observed for a few genes with increased expression during the moderate fat diet. In a multiple phase weight loss program, 3 patterns of variations in gene expression were observed. The first cluster was composed of genes downregulated during energy restriction (ER), upregulated during a weight stabilization phase (WS) and unchanged during entire dietary intervention (DI). A second cluster comprised genes not or up-regulated during ER and downregulated during WS and DI. A third cluster showed genes upregulated during DI. Genes downregulated during ER belonged mostly to adipocyte metabolism while inflammatory and macrophage genes were repressed during DI. Similarly, genes explaining changes in insulin sensitivity were different between ER and DI.

Conclusions: Energy restriction had a more pronounced impact on variations in human adipose tissue gene expression than macronutrient composition. However, a subset of genes is sensitive to macronutrient composition. Distinct sets of AT genes are regulated during calorie restriction and weight stabilization revealing an unexpected temporal pattern in the link between AT and insulin sensitivity during weight loss.

EFFECT OF GLUCOSE ON HYPOTHALAMIC GHERLIN

T. Handjieva-Darlenska, N. Boyadjieva
Department of Pharmacology and Toxicology, Medical Faculty, Medical University – Sofia, Bulgaria

Introduction: Ghrelin plays an important role in the regulation of appetite and energy homeostasis. It is well known that glucose activates the appetite. We have previously confirmed that ghrelin increases the appetite in rats. There are not enough investigations on in vitro effects of glucose on ghrelin in hypothalamic neurons. The question is whether glucose regulates the hypothalamic ghrelin.

Aim: The aim of this study was to investigate the effect of glucose on ghrelin from cultured hypothalamic cells.

Materials and Methods: Hypothalamic cells were isolated from 1-day new-born rats and cultured in HDME medium with serum supplement for a period of 9 days. Then cells were treated with or without glucose for different periods of time (2, 4, 24 and 48 h). The medium and cells were collected and ghrelin levels were determined by rat ghrelin ELISA (BioVendor). The cells were also used for determination of protein levels.

Results: The results demonstrated that glucose modulates the ghrelin levels in hypothalamic cells in a time-dependent manner. Taken together, our previously documented in vivo data and in vitro results from the present study suggest that glucose may play a role in the regulation of hypothalamic ghrelin.

METABOLIC EFFECTS OF CONJUGATED LINOLEIC ACID IN AN EXPERIMENTAL MODEL OF METABOLIC SYNDROME

H. Malínská, M. Maxová, M. Hubová, L. Kazdová
Institute for Clinical and Experimental Medicine, Prague, Czech Republic

Objective: Conjugated linoleic acid (CLA) is isomer of linoleic acid (C18:2n6) naturally present in fat and dairy products from ruminal species. Dietary intervention with CLA showed in some studies diminution of fat depots, anti-diabetic and anti-atherogenic effects. The mechanisms of these actions of CLA are not fully clarified at present. This study investigated whether dietary CLA could attenuate visceral adiposity and insulin-resistant state in non-obese hereditary hypertriglyceridemic rats.

Methods: Groups of adult male hereditary hypertriglyceridemic rats were fed ad libitum for 2 months, a high carbohydrate diet (70 cal % sucrose) with CLA (2 g/100 g) or with the same amount of sunflower oil (control group). The insulin sensitivity of adipose tissue and skeletal muscle tissues was measured by incorporation of 14C-U glucose into lipids and glycogen, respectively. Muscle fatty acid oxidation was determined in isolated soleus muscle by measuring the incorporation of 14C-U palmitic acid into CO2. Insulin concentrations were determined using Mercodia Rat Insulin ELISA kit (Mercodia AB, Uppsala, Sweden) and adiponectin concentrations by using Rat Adiponektin ELISA kit (B-Bridge International, CA, USA).

Results: Dietary CLA supplementation did not alter feed intake, but body weight (382 ± 8 g vs. 422 ± 15 g, p < 0.05) and weight of visceral adipose tissue (3.55 ± 0.25 g/100g b.wt. vs. 4.15 ± 0.21 g/100g b.wt., p < 0.01) were lower in CLA treated rats. Serum triglycerides (3.6 ± 0.4 vs. 5.01 ± 0.49 mmol/L, p < 0.01), free fatty acids (0.86 ± 0.05 vs. 1.25 ± 0.06 mmol/L p < 0.001), glycemia (5.6 ± 0.4 vs. 7.0 ± 0.4 mmol/L, p < 0.05) and adiponectin (7.48 ± 0.38 vs. 6.10 ± 0.33 µg/ml, p < 0.01) were distinctly reduced by CLA supplementation. In addition, CLA treated rats exhibited increased insulin sensitivity of adipose tissue (basal lipogenesis 287 ± 19 vs. 207 ± 16 nmol g⁻¹ g⁻¹ h⁻¹, p < 0.01; insulin stimulated: 432 ± 59 vs. 262 ± 18 nmol/g/2h, p < 0.05), palmitate oxidation in skeletal muscle (151 ± 7 vs. 124 ± 5 nmol palm./g/2h, p < 0.01), and basal (p < 0.01) and adrenaline stimulated release of fatty acids (p < 0.001).

Conclusions: These results suggest that CLA supplementation ameliorates insulin resistance, serum lipid levels and protects against weight gain of visceral adipose tissue. Increased fatty acid oxidation and elevated adiponectin secretion may play a role in the mechanism of these CLA actions.

Study was supported by grant MZ 000023001 from MH CR.
DIETARY N-3 ALPHA-LINOLENIC ACID AND N-3 TO N-6 FATTY ACIDS RATIO PREDICT IMPROVEMENT IN GLUCOSE METABOLISM DISTURBANCES AFTER INTERVENTION ON LIFESTYLE IN JAPANESE-BRAZILIANS

D.S. Sartorelli1, R. Damiao2, R. Chaim3, A. Hirai2, S.G.A. Gimeno2, S.R.G. Ferreira3, JBDSG2

1Social Medicine, School of Medicine of Ribeirão Preto, University of São Paulo (USP); 2Preventive Medicine, UNIFESP; 3University of Sagrado Coração (USC); 4Nutrition, School of Public Health, USP, Brazil

Objective: To investigate whether lifestyle-induced changes in dietary fat quality are related to improvements on glucose metabolism disturbances in Japanese-Brazilians.

Methods: 148 individuals from 1st and 2nd generations, with impaired glucose tolerance (IGT) or impaired fasting glycaemia (IFG), who attended a lifestyle counselling program during a 12-month follow-up period, were studied in Bauru, SP, Brazil. Baseline and 12-month follow-up dietary fatty acid values were estimated using 3 24-hour recall. The effect of dietary fat intake on glucose metabolism was investigated by multiple logistic regression models.

Results: At baseline, mean participant age (SD) and body mass index were, respectively, 60 (11) years and 25.5 (4.2) kg/m². After 12 months, 92 individuals had normal plasma glucose levels and 56 remained in pre-diabetic conditions. In logistic regression models adjusted for age, gender, baseline and 12 months practice of physical activity, waist circumference, total caloric intake, and basal nutrient intake, odds ratio [OR (95% CI)] for reversion to normoglycaemia, was 2.80 (1.10; 7.10) in the second tertile of n-3 α-linolenic acid consumption, when compared with lower intakes. Similarly, in the highest tertile of n-3 to n-6 fatty acids ratio, showed a higher chance of improving glucose disturbances, when compared with lower ratio intakes [2.60 (1.02; 6.66)].

Conclusions: Our findings support the evidence of an independent protective effect of n-3 α-linolenic acid and of the ratio n-3 to n-6 fatty acids on the glucose metabolism of high risk individuals.

THE ASSOCIATION BETWEEN ANXIETY, DEPRESSION, ALEXITHYMIA AND BINGE EATING IN OBESE PATIENTS

A. Zak-Golab1, B. Zahorska-Markiewicz2, R. Tomalski2, M. Holecki1, M. Bak-Sosnowska2

1Department of Pathophysiology, Medical University of Silesia, Katowice; 2Department of Psychiatry and Psychotherapy, Medical University of Silesia, Katowice; 3Department of Psychology, Medical University of Silesia, Katowice, Poland

Objective: The aim of the study was to investigate the relationships between anxiety, depression, alexithymia and binge eating in obese patients.

Methods: 103 obese patients (mean age 45.4 ± 13.2 yrs; BMI 37.3 ± 6.3 kg/m²) during the first visit in Obesity Outpatient Clinic completed self-report questionnaires including Hamilton Anxiety and Depression Scale (HADS), Binge Eating Scale (BES) and Toronto Alexithymia Scale (TAS 26).

Results: Prevalence of alexithymia was 42.72% and binge eating – medium and high – 34.95%. Women (n = 84) had higher level of anxiety (9.0 ± 4.0 vs. 6.7 ± 3.9; p < 0.05) and degree of binge eating (16.6 ± 9.8 vs. 10.3 ± 8.1; p < 0.01) in comparison to men (n = 19). Younger obese patients (<45 yrs) presented higher level of depression (6.7 ± 3.1 vs. 5.3 ± 3.8; p < 0.05) and binge eating (17.9 ± 9.8 vs. 13.5 ± 9.3; p < 0.01) than elder persons.

There was a correlation between anxiety and depression levels and the degree of binge eating (p < 0.0000001). Alexithymia had no effect on binge eating.

Conclusions: Prevalence of alexithymia and binge eating was high in examined group. Gender, age and degree of obesity had influence on anxiety and depression in obese patients.
LOSING WEIGHT AND MAINTAINING HEALTHY LIFE STYLE THROUGH INTERNET AND SMS

I. Málková, J. Divoká
STOB, Poljanovova 3158, Prague, Czech Republic

Introduction: Obesity represents a serious health and social problem in the Czech Republic. This problem is exploited by the business industry, which offers obese people thousands of crash diets. Primary health care alone cannot take long-term care of obese and overweight people who form half of the nation and therefore a comprehensive weight management program was formed in the Czech Republic. This approach integrates the broad scale of professional therapeutic possibilities from specialized medical care for complicated obesity at clinics to activity of STOB Society (STop OBesity) for people with a lower level of obesity. STOB was established in 1989 and has trained over 200 instructors and offers programs that help about 50 thousand people a year.

Activity of STOB: The main activities consist of organising weight reduction courses based on cognitive behavioural therapy, which are held in 100 towns. Besides courses for adults there are also specialized courses for men, diabetics and family courses for obese children.

In our paper we focus on a distant program for weight loss and life style maintenance.

STOB – publishes – self-help manuals
– an internet magazine
– organizes internet courses

We will describe an Internet course “Play and Stay Fit” for children (up to 150 schools – 4,500 children at the age of 6 to 15 were approached through this course) and an Internet course for adults “Live Healthy Easily” (8,500 people participated in this course).

Conclusions: Nowadays an activity of STOB society focuses on programs influencing many people at a low cost. The activities involve not just weight reduction but mainly maintenance of a gained weight loss. We try to be in contact with people in a new way – now also by means of internet courses and we offer also helpful text messages (SMS). We would like to help people not only to acquire knowledge but also to transfer it into real life situations.

EXERCISE THERAPY IN THE TREATMENT OF MORBID OBESITY

E. Halmy1, L. Halmy2
1Hungarian Association for Overweight and Obese; 2Hungarian Society for the Study of Obesity, Budapest, Hungary

Objective: Morbid obesity (BMI > 40 kg/m2) is coming into prominence. Its prevalence in Hungary is estimated to reach 150,000. Its significance is highlighted not only by the co-morbidities (ischemic heart disease, heart failure, type-2 diabetes, sleep apnea) but by its impact on quality of life too. Surgical treatment is not available in a majority of the patients, which makes necessary the introduction of life-style therapy. The start of life-style therapy is rendered more and more difficult with the progress of obesity, due to changes in weight, fitness and cardiac function. Further problem is the impatience of the patients who whish to lose a lot of weight in short-term. Psychological support is therefore inevitable.

Aim of Our Study: To investigate whether life-style therapy is successful in significant weight loss and in preparing patients to surgical therapy.

Material: 69 morbidly obese patients, 36 males and 33 females. Their age was between 29–72 years, median 44. Mean length of treatment was 20 days.

Method: 1000–1500 kcal/day diet, underwater exercise, exercise, and brisk walking controlled with Omron HJ-113-E step meter. Bio-impedance was measured by InBody 720.

Results: Mean body weight decreased from 139.84 to 132.11 kg, BMI from 47.89 to 45.25 kg/m2, arm circumference from 53.05 to 49.96 cm, fat mass from 65.47 to 60.53 kg, waist circumference from 136.12 to 130.27 cm, hip circumference from 139.71 to 135.01 cm, intra-abdominal fat area from 205.80 to 196.86 cm2. All parameters showed strongly significant decrease. In some cases weight loss during the following outpatient care reached more than 40 kg. Calculated basal metabolic rate decreased from 1923.53 to 1870.47 kcal. Decrease of body weight in percent was 5.53%. Patients requiring surgical treatment became suitable for the operation. Risk factors decreased significantly.

Mean walking distance of the patients during the treatment was 125.74 km, meaning 256,448 steps. Energy requirement for walking was 11,999.28 kcal.

Conclusion: The introduction of life-style therapy proved to be effective in the treatment of morbid obese patients. Significant decrease of body weight or the preservation of the smaller weight is only feasible with cooperation and the aid of organized follow-up.
APPETITE AND SATIETY HORMONAL LEVELS IN ADULT WOMEN WITH OBESITY AND BINGE EATING DISORDER

1Department of Social Medicine, 2Department of Physiological Sciences, Universidade do Estado do Rio de Janeiro, RJ, Brazil

Objective: The study evaluated the hormones levels that regulate the process of appetite and satiety in obese adult women.

Methods: We studied three groups of adult women: Lean (GL), Obese (GO) and Obese with Binge Eating Disorder (BED). Serum hormones levels: insulin, peptide YY3-36 (PYY3-36), ghrelin, adiponectin and orexin, were measured by radioimmunoassay. Blood samples were collected before meal intake, and at 15, 60, and 90 minutes after a meal provided (55% carbohydrates, 15% protein and 30% lipids). Repeated measures were analyzed among groups and over time.

Results: Insulin levels of GO group (140.4 ± 80.3) were higher (p = 0.01) than BED (99.4 ± 43.2) and GL (67.1 ± 27.4) and over time (p < 0.0001). Adiponectin levels of BED group (29.8 ± 12.7) had lower concentration (p = 0.01) than GO (36.1 ± 20.0) and GL (46.7 ± 15.6) and were not found statistical difference over time (p = 0.88). Ghrelin levels of BED group (740.8 ± 215.6) were lower (p = 0.002) than GO (945.2 ± 421.6) and GL (976.6 ± 281.0), and were not found statistical difference over time (p = 0.35). Orexin levels of BED group (2.4 ± 0.35) was lower (p < 0.0001) over time than GO (2.3 ± 0.45) and GL (2.3 ± 0.37), however, was not found statistical difference among groups (p = 0.73). PYY3-36 levels in BED group (78.5 ± 32) were lower (p = 0.02) than GO (115.5 ± 33.2) and GL (97.3 ± 41.9) groups, and statistically different over time (p = 0.03).

Conclusions: The results show among the hormones only PYY is differently associated to obesity and BED.

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PREGNANCY FOLLOWING BARIATRIC SURGERY (SAGB)

K. Dolezalova, M. Fried
1Clinical Center for Minimally Invasive and Bariatric Surgery, ISCARE-Lighthouse, Prague, Czech Republic; 21st Faculty of Medicine, Charles University, Prague, Czech Republic

Objective: Large number of morbidly obese women suffers from impaired fertility. If they at all become pregnant, their pregnancy usually have to be considered as high risk, because of often present co-morbidities, i.e. hypertension, T2DM, etc. They are more likely to end up with Caesarean section. Weight loss after gastric banding may increase pregnancy capability, and reduce incidence of pregnancy associated complications.

Methods: In a retrospectively designed study, all patients who became pregnant within 3 years after SAGB were included. Number of complications related to both SAGB and pregnancies/deliveries were recorded, as well as patients' weight development during and after pregnancy.

Results: From January 2005–January 2007, 724 women (80.8% of all patients) underwent SAGB implantation. Out of that were 386 (53.3%) in child bearing age. All post SAGB pregnancies (17 (2.4%) were reported during the first year after bariatric surgery, and were incidental. In the period of 1–6 months after surgery 9 pregnancies (52.3%) occurred. Mean % EWL prior to pregnancy was 21.7. Fifteen women (88.1%) gained only 2–3 kg, until the 7th month of pregnancy, as they were in the rapid weight loss phase. Mean total weight gain during pregnancies was 9 kg. There was no Caesarean section in this group of women. Neonatal weight was within the normal range of mean birth weights in the country. In 2 patients non-SAGB related complications – acute cholecystitis and appendicitis – occurred during pregnancies.

Conclusions: Gastric banding (SAGB) does not interfere with pregnancy after bariatric surgery, and is safe and well-tolerated.
Objective: Laparoscopic sleeve gastrectomy (LSG) became common bariatric method and on the basis of last studies and many experiences seems to be possible to use as a single restrictive bariatric method for morbid obesity (MO). The outcomes and initial results of LSG have been evaluated.

Method: 63 MO patients (20 males, 43 females) underwent LSG from January 2006 to June 2008. Average age was 37.3 years (29–65), height was 168 cm (151–187), weight was 118 kg (97–181) and average BMI was 41.8 (36.1–60.4). The gastric resection (the linear stapler Echelon60, Ethicon, blue load) started 6 cm from pylorus and ended in the angle of Hiss. For guiding gastric resection the 38F intragastric tube was used.

Results: Mean operating time was 105 min (80–170), no conversion to open surgery. An eighteen-month follow-up was in 39 MO patients. Average weight loss was 31.3 ± 5.1 kg, average % excess BMI-Loss reached 73 ± 2.4 % 18 months and average % EWL was 81% ± 6.4 % after the procedure.

Conclusions: The LSG seems to be rather safe bariatric procedure with good results in weight loss and quality of life.

Objective: Laparoscopic adjustable gastric banding is a safe and effective procedure for management of morbid obesity. However, band slippage and dysphagia are a common complication with variable presentation that can be rectified by a second surgical procedure.

Methods: We studied case series of 38 consecutive patients who suffered from band slippage and dysphagia between 1989 and 2004 years from a group of 546 open and laparoscopic gastric banding procedures performed during this time. The decision of whether to remove/reposition or replace the band was made prior to the operation, although the specific method used when replacement or repositioning was deemed suitable was determined by the operative findings. In 22 patients with band slippage who had inadequate weight loss we used new method of revisional operation. During reoperation band reposition was performed. After the reposition of the band we performed Roux-en-Y gastric bypass. The diameter of the stoma between proximal gastric pouch and jejunum was 5–7 mm. So this method of revisional operation includes the restrictive and shunting effects. After operation we can control the diameter of the stoma between proximal and distal parts of the stomach so we can regulate the volume of food passing by natural way.

Results: There was no mortality. 15 revisional operations were performed laparoscopically and 7 by open method. Wound complications were observed in 2 patients after open procedures. After a follow-up of 3 years all 22 patients were satisfied and had good results. The average loss of excess weight was 62.5 ± 5.7%. There were no symptoms of dysphagia in all 22 patients, no symptoms of malabsorption were seen.

Conclusions: Band slippage is not a rare complication after gastric banding. Combined revisional operations with band reposition and Roux-en-Y gastric bypass are effective enough for achieving adequate weight loss without syndromes of malabsorption.
ESTIMATION AND CORRECTION OF NUTRITIONAL STATUS OF PATIENTS WITH TYPE 2 DIABETES ON BASIS OF THE MODERN METHODS OF NUTRIMETABOLOMICA

Kh. Sharafetdinov, V. Zykina, O. Plotnikova, A. Vasiliev, G. Maltev
Institute of Nutrition of RAMS, Moscow, Russia

Objective: The aim of this study was to investigate nutritional status of type 2 diabetes patients using modern techniques of nutrimetabolomica – the multilevel diagnostic system of disturbance of nutritional status and estimation of the alimentary-dependent disease risk ‘Nutritest-IN 3’. On basis of findings individualization of dietary therapy was realized using the multilevel system of the correction of nutritional status disturbance and correction of alimentary-dependent disease ‘Nutricor-IN 3’.

Methods: Sixty type 2 diabetes mellitus patients aged 56 ± 0.9 years were observed, 96% of them had obesity with body mass index 38.9 ± 0.7 kg/m². Nutritional status was assessed by method of indirect calorimetry, bioimpedance analysis, immunoenzyme method, biochemical method, computer-based assessment of food consumption.

Results: Dietary energy redundancy was observed in 80 per cent of the subjects. Overwhelming majority of these patients had redundant fat consumption 136 ± 5.4 g/day. Average consumption of carbohydrate was 294 ± 7.6 g/day, protein intake – 108 ± 4.7 g/day. The mean fasting glucose plasma concentration was 9.0 ± 0.3 mmol/L. 85% and 93% patients had increased level of total cholesterol and triacylglycerol accordingly. Data of indirect calorimetry were shown the decrease metabolism rate and rate of fat oxidation.

Individualization of dietary therapy of type 2 diabetes patients was included modification of protein, fat and carbohydrate contents in diet with use of vitamin and mineral complexes. It was shown the decrease of basal level of glycaemia by 30% and improvement of lipid parameters.

Conclusions: Estimation of nutritional status of patients with type 2 diabetes pointed to need individualization of standard dietary treatment allows to improve glycaemic and lipid parameters in these patients.

IMPAIRED GLUCOSE TOLERANCE IN WOMEN WITH POLYCYSTIC OVARY SYNDROME: ONLY OBESE SUBJECTS ARE AFFECTED MORE COMMON THAN HEALTHY FEMALES

J. Vrbikova1, M. Fanta2, D. Cibula2, B. Bendlova1, K. Vondra1
1Institute of Endocrinology, Prague, Czech Republic; 2Dept of Obstetrics and Gynecology, Charles University, Prague, Czech Republic

Objective: To compare the prevalence of impaired glucose tolerance (IGT) according to WHO criteria in lean and obese women with polycystic ovary syndrome (PCOS) of fertile age with the data from population sample.

Methods: Retrospective study of women affected with hyperandrogenic symptoms evaluated during 10 years at tertiary referral centre. Both National Institute of Health (NIH) and European Society for Human Reproduction (ESHRE) criteria were applied to diagnose PCOS. PCOS-affected women underwent oral glucose tolerance test. Prevalence of IGT in control white healthy females was extracted from the published data from NHANES II (1).

Results: Between 1997 till 2007. 346 women with hyperandrogenic conditions were evaluated and 327 and 272 subjects fulfilled ESHRE and NIH diagnostic criteria, respectively. In ESHRE+ women (n = 260), IGT was present in 7/120 (5.8%) lean and in 18/140 (12.8%) obese subjects. Diabetes mellitus type 2 (T2DM) was diagnosed in 1/120 (0.8%) lean and in 3/140 (2.1%) obese women. In NIH+ women (n = 221), IGT was diagnosed in 6/98 (6.1%) lean and in 18/123 (14.6%) obese subjects and T2DM in 1/98 (1.0%) lean and in 4/123 (3.3 %) obese subjects. In sample of 643 women from NHANES II, the crude rate of IGT was 5.9 %. IGT was significantly more common only in obese PCOS subgroups than in NHANES II cohort (ESHRE+: chi square 6.25, p < 0.01; NIH+: chi square 7.32, p < 0.007).

Conclusions: Impaired glucose tolerance was found significantly more often only in obese, but not in lean PCOS women in comparison with healthy controls.

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CHANGES OF GLUCOSE METABOLISM IN OBESE CHILDREN
N. Lasztity, S. Almassy, É. Németh, A. Czinner
I. Department of Pediatrics, Heim Pal Children Hospital, Budapest, Hungary

Pediatric obesity is associated with the development of cardiovascular risk factors including type 2 diabetes, hypertension, dyslipidemia, and the metabolic syndrome. Obese children and adolescence seem to have increased risk to develop disturbed glucose metabolism. The prevalence of childhood obesity and type II diabetes has increased in the last two decades. In our previous study we found that 70% of investigated obese children had insulin resistance, impaired glucose tolerance was presented in 25% of children. We measured the daily activity of these children. High level of moderate physical activity was associated with lower incidence of glucose intolerance. In 2007 we examined 237 obese children (109 girls and 128 boys, age groups: 5–10 years: 59, 11–14 years: 116, 15–18 years: 60). Beside the anthropometric measurements (body mass index, body composition with multi-frequency segmental bioelectrical impedance analysis), abdominal ultrasound examination, 24 h blood pressure monitoring, measurements of serum lipids we performed the 3 h oral glucose tolerance test (OGTT). In 51 cases we determined the serum insulin levels at 0, 30 and 120 minutes during the OGTT. We diagnosed IGT in 5/51, impaired fasting glucose (IFG) in 1/51, metabolic syndrome in 4/51 children, hyperinsulinism was found in 36/51 children. Obese children with increased serum insulin levels without the presence of IGT according to WHO criteria, had serum glucose levels above the fasting value or decreased, sometimes hypoglycemic values at the 180th minute of the test. Comparing the groups of children with normal and increased insulin levels there were no significant differences in anthropometric values (abdominal circumference, body fat %, waist to hip ratio), serum lipid and C-reactive protein levels. According to our results the hyperinsulinism and disturbed glucose metabolism showed increased prevalence in obese children. Several signs of insulin resistance and impaired glucose regulation might predict an increased risk for cardiovascular complications. Early intervention (proper nutrition, increased physical activity) and identifications of these children is important for the prevention of cardiovascular diseases.

RAPID WEIGHT LOSS LEADS TO IMPROVEMENT IN LIVER SIZE AND FUNCTION
K. Owen, N. Machková, V. Komárek
Iscare Clinical centre, Obesity Treatment Unit, Prague, Czech Republic

Objective: Nonalcoholic fatty liver disease (NAFLD) is a significant health problem affecting large proportions of adult populations worldwide. The mechanisms underlying this disease have not been clarified yet, however, insulin resistance and obesity-related inflammation are among the most likely causes. Therefore, we have tried to establish the role of rapid weight loss in improving the metabolic and ultrasound markers of NAFLD.

Methods: At the time of writing of this abstract, 44 patients underwent metabolic and ultrasound screening at the beginning of a 3-month lifestyle modification period prior to metabolic surgery (mostly SG), with a subset of patients where lifestyle modification was reinforced by sibutramine. After a weight loss of a minimum of 5% of their initial weight, at the end of that period, LFT and ultrasound examination have been repeated, in order to establish the difference in ALT and AST, their ratio, and the size of liver in MCL. A control group of patients who did not lose the target amount of weight, or even gained weight, are being used for comparison.

Results: 29 patients (20 women, 9 men) have lost the target weight, 15 have not (8 women, 7 men). Weight loss of 5 or more per cent initial weight lead to an average reduction in liver size by ~2.8 mm in MCL, as opposed to a slight increase in liver size in control group of +0.8 mm. There seems to be a corresponding reduction in corresponding liver function tests, but, due to a relatively small number of patients so far, with a large spread.

Conclusion: Preliminary data suggests that rapid weight loss pre-surgery is associated with a marked reduction in liver size, probably accompanied by improvement in liver function. These results will be verified in time of the congress on a larger sample, which will allow proper statistical evaluation as well as comparative evaluation of the mode of weight loss (lifestyle vs. lifestyle plus sibutramine).
**RELATIONSHIP BETWEEN ANTHROPOMETRIC INDICES AND MEATABOLIC SYNDROME IN PATIENTS WITH CAROTID ATHEROSCLEROSIS**

*M. Maksimovic, Dj. Radak, J. Maksimovic, M. Gajic, J. Jorga*

1Institute of Hygiene and Medical Ecology, School of Medicine, University of Belgrade, Serbia; 2Vascular Surgery Clinic, Dedine Cardiovascular Institute, Belgrade, Serbia; 3Institute of Epidemiology, School of Medicine, University of Belgrade, Serbia; 4Institute for Statistics, School of Medicine, University of Belgrade, Serbia

**Objective:** The aim of this study was to show relationships between anthropometric indices and metabolic syndrome in patients with carotid atherosclerosis.

**Methods:** The research involved 530 patients with verified carotid atherosclerosis 64.96 ± 8.34 years old who referred to the Vascular Surgery Clinic Dedine in Belgrade. Body Mass Index (BMI) was calculated as weight (kg) divided by height (m²) and categorized according to WHO criteria. Waist circumference (WC) was measured at the midway between lower rib and crista iliaca. Body fat was calculated according to method proposed by Durnin and Womersley. According to NCEP III criteria, patients were classified as having metabolic syndrome (MSy) or not. Carotid atherosclerosis were estimated by high resolution B-mode ultrasonography, and according to the level of stenosis patients divided into group with stenosis more than 50% and less than 50%. Data were analyzed using SPSS package version 9.

**Results:** Patients with MSy had higher average BMI than patients without it (28.52 ± 3.97 kg/m² vs. 24.95 ± 3.09; F = 142.465, p = 0.000). Percent of body fat was higher in patients with MSy than in patients without it (33.94 ± 6.59 vs. 28.31 ± 6.45; F = 106.923, p = 0.000). Patients with significant carotid stenosis had higher WC than patients without it (93.20 ± 11.68 vs. 96.86 ± 10.80 cm, F = 4.326, p = 0.038).

**Conclusion:** These results suggest that obesity, especially expressed according to WC have a very important role in the development on the inflammation associated with the metabolic syndrome initially, progression of carotid diseases and later cerebrovascular consequences.

**EFFECTS OF REGULAR DAILY INTAKE OF BLACK TEA ON OXIDATIVE STRESS AND SERUM C-REACTIVE PROTEIN LEVELS IN THE OVER-WEIGHT PATIENTS WITH TYPE 2 DIABETES**

*T.R. Neyestani, N. Shariatzade, A. Kalayi, A. Gharavi, N. Khalaji*

Laboratory of Nutrition Research, National Nutrition and Food Technology Research Institute and Faculty, Shaheed Beheshti University (M.C.), Tehran, Iran

**Objective:** This study was undertaken to evaluate the possible effects of different daily doses of black tea intake on certain biomarkers of oxidative stress and inflammation in the over-weight patients with type 2 diabetes mellitus (T2DM).

**Methods:** A total of 45 patients of known cases of over-weight T2DM (16 males and 29 females) (25 < body mass index ≤ 30) were enrolled in the controlled clinical trial and randomly assigned to either test (57.0 ± 7.9 yrs, n = 23) or control (55.4 ± 8.3 yrs, n = 22) group. Patients were instructed to have only one cup (150 mL) of black tea/day, as a 2.5 g tea bag for one week (washout period). Patients in the test group were instructed to have 300, 450 and 600 mL in the weeks 2, 3 and 4, respectively, while patients in the control group continued taking in only one cup of black tea by the end of the study. In the end of each week, fasting venous blood samples were taken (from both test and control groups) and dietary assessment was done for all the patients.

**Results:** Daily intake of black tea up to 4 cups (10 g/day significantly increased serum total antioxidant capacity (TAC). The enhancing effect of black tea on TAC was, however, similar for 1 to 4 cups/day. Daily intake of 2 cups of black tea showed the most suppressing effect on serum malondialdehyde (MDA), a lipid peroxidation product, but serum C-reactive protein significantly decreased by daily intake of more than 3 cups of black tea.

**Conclusion:** Daily intake of more than 3 cups of black tea may help to prevent long-term complications, notably CVD, through attenuating oxidative stress and inflammatory processes in the over-weight diabetic patients.
Objective: This study aimed to investigate the association of maternal educational levels and overweight and obesity among Iranian adolescent girls 14-17 y in rural areas in Guilan province in 2006.

Method: A multistage sampling method was used and 1036 randomly selected school girls were studied in rural areas in Guilan-Iran. Data on age and mother’s years of schooling were collected using questionnaire and body weight and height were measured. Overweight and obesity were defined according to the International obesity task force (IOTF). Data analysis included two groups based on mother’s years of schooling as less educated (≤ 7 schooling) and more educated (≥ 8 y schooling).

Results: These results showed that the overall prevalence of overweight and obesity in this population were 18.6 and 5.2 percent, respectively. Results of logistic regression showed that the risk of overweight was higher in the lower age group (OR=2.5, 95% CI 0.16-3.3). In this study, overweight was more common in girls with more educated mothers than the girls with less educated mothers (30.0% vs. 20.3% P=0.001).

Conclusion: These data indicated that overweight/obsity is highly prevalent among the adolescent girls, especially in higher maternal educational level and the rate is exceeding those reported in urban residents. Preventive strategies need to be adopted to combat the epidemic of overweight in this population.

Objective: The aim of this research is comparison of eating habits of children, of ages between 4 and 6 and attend to private and government pre-school education, and evaluation of their tendency to obesity

Methods: Anthropometric measurements and questionnaire was used.

Results: There exist a difference between family incomes between the children who attend to private and government pre-schools (p<0.05). The daily cereal group consumption of the children who attend to private pre-schools is 73.0%, whereas it is 67.0% for children who attend government pre-schools. Children that attend to private pre-schools consume more fast-food than that attend to government pre-schools. There exists no apparent difference between their total milk consumption (p>0.05). There exist differences in total consumption of meats with respect to children’s family income. In general 44.5% of the children consume vegetables and 88.1% of them consume fresh fruits daily. There hasn’t been found an apparent difference in BMI with respect to the type of school (p>0.05). There exists an apparent difference between mean heights of the two groups (p<0.05) however there hasn’t been found and apparent difference between their weights (p>0.05).

Conclusions: In conclusion there has been found a slight difference between the BMI of children who came from families with various family incomes. In general the tendency to obesity has been found to be low for the children of this region.
MACRONUTRIENTS INTAKE AND ANTHROPOMETRIC PROFILE OF OVERWEIGHT WOMEN FROM PORTO ALEGRE, BRAZIL

B. Weber, G.H. Cibeira, C.M. Laflor, M. Caleffi
Moinhos de Vento Hospital, Porto Alegre, Brazil

Objective: To evaluate the macronutrients consumption and the anthropometrical profile of a sample of overweight women registered at the Núcleo Mama Porto Alegre (NMPOA) research project. The NMPOA project is a screening program for breast cancer that has 9233 women registered who will be followed for 10 years.

Methods: A retrospective transversal study that included overweight women [Body Mass Index (BMI) ≥ 25 kg/m²] directed from Programas de Saúde da Família and Unidades Básicas de Saúde (Family Health Program and Health Basic Unit) accredited at NMPOA has been carried out. 1033 women were evaluated with mean age of 49.36 ± 9.79 years. Weight, height, BMI, waist and hips circumference and consumption of macronutrients were verified.

Results: Dietetic analysis showed a dairy consumption of 2.192.72 ± 953.92 calories, 48.25 ± 9.34% of carbohydrate, 15.14 ± 4.30% of protein and 36.62 ± 9.30% of lipid. 79.9% of women were sedentary and 20% were smoking. The anthropometric evaluation showed a mean of BMI of 32.24 ± 5.16kg/m² and abdominal and hips circumference were respectively of 98.58 ± 10.97 and 109.46 ± 10.05.

Conclusion: The excessive consumption of calories, mainly from lipids, and the high BMI identified at this group of women, emphasizes the importance of dietetic intervention. We understand that a program of nutritional counseling needs to be continued, with the intention to change the patients lifestyle, in special alimentary habits, to prevent chronic diseases as breast cancer.

SECULAR TENDENCY OF THE BMI IN BOYS BRAZILIANS

L.P.G. Mascarenhas1, A. C. Smoralek2, R. Bozza2, T.S. Fiola2, M.C.S. Boguszewski2
1Unidade Endocrinologia Pediátrica, Universidade Federal do Paraná; Brasil; 2CEPEE, Universidade Federal do Paraná; Brasil

Objective: Of this study was monitored longitudinally changes in BMI in children.

Methods: The sample was composed of 707 boys (age 10.57±0.86) from Curitiba, Brazil. To analyze the data were formed three groups, with the first assessment conducted between the years of 1990 to 1993 (37% of the sample), the second between the years of 2000 to 2003 (54%) and the third group of year 2007 (9%). Every child was evaluated once a year at total of 1807 measures. The BMI was measured following the usual procedures anthropometrics. For statistical analyses were used the descriptive statistics, anova and regression binaries, with p <0.05.

Results: Table 1 shows the variables measure and in table 2 the comparisons between the values of percentile by the years.

<table>
<thead>
<tr>
<th>Body Mass (Kg/m²)</th>
<th>1990-1993 (n=229)</th>
<th>2000-2003 (n=321)</th>
<th>2007(n=157)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI P85</td>
<td>18.75 ab</td>
<td>21.02</td>
<td>21.94</td>
</tr>
<tr>
<td>P95</td>
<td>20.54 ab</td>
<td>23.55</td>
<td>24.46</td>
</tr>
</tbody>
</table>

Conclusion: The study show that during periods assessed the BMI comes increasing gradually over the years. The BMI increased about 22 and 13 percentile points between the period of 1990-1993 to 2000-2003 for overweight and obesity respectively. Observing data 2007 noticed that obesity increased almost 5 percentile points compared with group 2000-2003.
SHORT STATURE AND OBESITY IN A MULTILEVEL ANALYSIS IN STATE CAPITAL CITIES IN BRAZIL
R. Sichieri1, E. C. Moura2
1Dept of Epidemiology, State University of Rio de Janeiro, Brazil; 2Instituto de Ciências da Saúde da Universidade Federal do Pará, Brazil

Objective: We investigated the associations between individual and city-level measures of socioeconomic status and short stature (a marker of early undernutrition) with body mass index (BMI) and obesity among Brazilian adults, by using a multilevel analytical approach.

Methods: A cross-sectional telephone survey was conducted in 2006. The study probabilistic sample consisted of 54,369 adults, from the urban areas of all 27 state capital cities in Brazil. Data was collected from about 2,000 households in each of the cities. Weight and height were self-reported.

Results: After controlling for individual and city socio-demographic characteristics and behaviors, high BMI was strongly associated with short stature of individuals, but not with the mean stature of the cities’ residents. Prevalence of short stature (< gender 5th percentile) varied from 1% to 9% among cities. More than 95% of BMI variation for both men and women was due to short stature of individuals. Among women of short stature the odds of being obese was 2.9 (95% CI 2.1-4.1) compared to those with stature greater than the 5th percentile. Among men, this Odds Ratio was 2.1 (95% CI 1.5-2.7).

Conclusions: Despite the growing body of evidence that environmental factors such as poor food choices and physical inactivity are the main determinants of the worldwide obesity epidemic, the greater difference in BMI and prevalence of obesity in the Brazilian capitals was explained mainly by individual factors. We found a strong association between obesity and short stature after adjustment for diet, physical activity, and many environmental factors. Intra and inter-generational consequences of undernutrition are an alternative explanation for the regional disparities in obesity in Brazil.

Funded by Brazilian Minister of Health

BODY MASS INDEX AND PERCEPTIONS OF BODY AMONGST ASIAN UNIVERSITY STUDENTS
F.P.V. Lin1, L.R.C. Chew2, S.K.R. Ng3
1Dept of Sports Sci & Phy Edu. the Chinese University of Hong Kong, Hong Kong; 2Dept of Psychological Studies, Nanyang Technological University, Singapore; 3Phy Edu Section, the Hong Kong Polytechnic University, Hong Kong

Objective: The prevalence of both obesity and eating disorders are on the rise worldwide, especially in the young. This study explored the relationship between different weight status as measured by body mass index (BMI) and the perception of body image and health among university students.

Methods: Students were recruited from different universities in Hong Kong and Singapore to fill in a bilingual self-administered questionnaire. Respondents had to match 9 men (and women) drawings of different sizes with words such as sickly, healthy, underweight, and obese. They also recorded their current and ideal body images. BMI was calculated using self-reported weight and height. Body image discrepancy (BID) was the difference between ideal and current body images selected from the 9-figure rating scale. Spearman’s rho correlation analyses were conducted separately for men and women.

Results: As the pilot of a large scale survey, 40 men (mean age 21.4 ± 1.4 years) and 41 women (mean age 21.3 ± 1.2 years) took part in the study. The mean BMIs were 21.9 ± 4.0 and 20.0 ± 3.0 kg/m² for men and women respectively. For men, 32.5% wanted to be thinner whereas 37.5% wanted to be fatter. For women, 58.5% wanted to be thinner whereas 9.8% wanted to be fatter. BID was negatively correlated with BMI in men (r=-.656) and women (r=-.545). Most underweight men (BMI <18.5) did not describe the skinny figure as sickly, whereas most overweight men (BMI >23.0) did not describe the skinny figure as sickly. Similar results were found in women. In the perception of “healthiest”, overweight men perceived the fatter male figures as the healthiest; but slimmer female figures as the healthiest. On the other hand, overweight women perceived slimmer male figures as the healthiest; and fatter female figures as the healthiest.

Conclusions: The study indicates that an increase in BMI aggravates an increase in BID. Weight status influenced the gender perception of the healthiest figure. Overweight people tended to regard slim as healthy in opposite gender, but for the same gender fat is healthy. The study highlights a need for interventions to help young adults develop a healthy and realistic body image and healthy ways to manage their weight.
Obesity in Brazil: Prevalence and Social Distribution, 2007

E.C. Moura¹, D.C. Malta², C.A. Monteiro²

¹Universidade Federal do Pará, ²Ministério da Saúde, ³Universidade de São Paulo

Objective: To estimate the prevalence of obesity and its association with schooling among adults of all the 26 provincial capitals and the Federal District of Brazil, in 2007.

Methods: A probabilistic sample of more than 54,000 subjects was studied based on computer-assisted telephone interviewing. Weight and height were self-reported in order to determine the body mass index (BMI). Obesity was considered when the BMI was ≥ 30 Kg/m². All the estimates were done using weighting factors, which took into account the socio-demographic distribution of the adult population of each city according to the 2000 Demographic Census. Poisson regression was used to assess the age-adjusted association between obesity and level of schooling.

Results: The overall prevalence of obesity was 12.9% being higher among men (13.7%) than among women (12.0%), particularly for individuals with higher level of schooling. Among men, there was no difference in the prevalence of obesity by schooling level, but for women the prevalence decreased with the increase of schooling level: from 18.8% for women with less than four years of schooling to 7.5% for women with 12 or more years of schooling. Men presented higher prevalence of obesity, comparatively to women, in the two highest level of schooling: nine to 11 years (12.6% vs. 9.0%) and 12 and more years (15.3% vs. 7.5%). The age-adjusted association between level of schooling and obesity was significant among women (p < 0.001) but not among men.

Conclusion: Higher level of schooling is a protective factor against obesity only for women.

The Influence of the Established Goals on the Decrease of Body Mass


Department of Pathophysiology, Medical University of Silesia, Katowice, Poland

Objective: The aim of this study was to assess the influence of the established goals of the treatment on the decrease of the body mass in patients treated in the complex weight loss programme.

Methods: The study group involved 27 obese subjects starting complex group weight reduction treatment (age 44.8 ± 13.4 years). Before and after treatment weight and height were measured and BMI was calculated. Before treatment patients were asked to mark in BFPQ figure which they would like to achieve after therapy. On the basis of calculated BMI we marked in BFPQ questionnaire figures which had study subjects (a) and compare this figure with figure marked by patients (b) and on the basis revealed results we divided to 3 subgroups A - possible goals (subtraction a-b ≤ 1); B - mild-possible goals (subtraction a-b = 2 or 3) and C - impossible goals (subtraction a-b ≥ 4).

Results: There were no differences between decrease of body mass and the established goals of the treatment set by patients before starting weight reduction programme.

There were no correlations between the level of the established goals set before treatment and decrease of the body mass and decrease of BMI.

Conclusions: The established goals set by patients before treatment doesn’t influence the decrease of body mass in patients participated in the complex group weight reduction programme.
THE INFLUENCE OF THE COMPLEX GROUP WEIGHT LOSS PROGRAMME ON THE PERCEPTION OF THE OWN FIGURE AND ON THE POSSIBILITY OF THE GOALS


Department of Pathophysiology, Medical University of Silesia, Katowice, Poland

Objective: The complex group weight loss programme could change, by education and psychotherapy, the perception of the own figure and the possibility of the achieved goals apart from the influence on the decrease of body mass. The aim of this study was to assess the influence of the complex group weight loss programme on the perception of the own figure and the possibility of the goals.

Methods: The study group involved 27 obese (age 44.8 ± 13.4 years, BMI 37.04 ± 6.45 kg/m²). Before and after treatment weight and height were measured and BMI was calculated; patients were asked to mark in BFPQ questionnaire their own figure at the time (a) and figure they would like to achieve (b).

Results: There were no differences between the perception of the own figure before and after treatment. After therapy significantly fewer patients set themselves impossible goals (chi² = 4.52; p < 0.05).

Conclusions: The complex group weight reduction programme does not influence perception of the own figure. However, it helps patients set realistic therapeutic goals.

PERCEPTION OF THE OWN FIGURE IN PATIENTS STARTING THE COMPLEX WEIGHT LOSS PROGRAMME


Department of Pathophysiology, Medical University of Silesia, Katowice, Poland

Objective: The aim of present study was to assess the perception of the own figure in overweight and obese subjects starting the complex weight loss programme.

Methods: 80 subjects starting complex group weight reduction treatment (age 41.8 ± 11.9 years, body mass 93.6 ± 14.8 kg, BMI 35.7 ± 5.3 kg/m²). Weight and height were measured and BMI was calculated. Patients were asked to mark in BFPQ questionnaire their own figure. Then we compare calculated BMI of study subjects with marked figure.

Results: 67 subjects (79.0%) indicated the proper figure (subtraction: figure marked to the real BMI – figure marked in questionnaire ≤ 1), 17 subjects (21%) indicated the wrong figure (subtraction ≥ 2) – 7 of them enlarged their figure and 10 of them lowered it. We also divided study group according to BMI: A - 25.0 – 29.9 kg/m²; B - 30.0 – 34.9 kg/m²; C - 35.0 – 39.9 kg/m²; D - ≥ 40 kg/m².

Subjects with BMI < 35.0 kg/m² had significant higher tendency to perceive the own figure greater than it is when compared to subjects with BMI ≥ 35kg/m² (chi² = 7.61; p < 0.01).

Conclusions: Most obese subjects starting the complex group weight reduction treatment perceive their own figures in proper way. Subjects with overweight and I grade obesity had significantly greater tendency to perceive their own figure as very obese.
THE POSSIBILITY OF THE GOALS SET BY PATIENTS STARTING THE COMPLEX WEIGHT LOSS PROGRAMME


Department of Pathophysiology, Medical University of Silesia, Katowice, Poland

Objective: Patients starting the complex group weight loss programme set themselves different goals, which can influence the effect of treatment. The aim of this study was to assess the possibility of fulfilling goals set by patients before starting the complex weight loss programme.

Methods: 80 subjects starting complex group weight reduction treatment (age $41.8 \pm 11.9$ years, BMI $35.7 \pm 5.3$ kg/m$^2$) chose appropriate figure in BFPQ scale (a), patients were asked how many years they had been obese and to mark in BFPQ questionnaire (adapted by Stunkard) figure they would like to achieve after therapy (b). On the basis of possibility of set goals subjects were divided to three subgroups A - possible goals (subtraction $a-b \leq 1$); B - mild-possible goals (subtraction $a-b = 2$ or $3$) and C - impossible goals (subtraction $a-b \geq 4$).

Results: There were no correlations between possibility of the goals and gender, age, time of being obese and ratio: time of being obese / age and BMI study subjects.

Conclusions: Patients starting the complex group weight reduction treatment did not set their own aims realistic. It is interesting that older subjects set own realistic goals more frequently.

HERITABILITY OF BODY MASS INDEX (BMI) IN CHILEAN MONOZYGOTIC (MZ) AND DIZYGOTIC (DZ) TWINS

D. Ivanovic1,2, E. Llop3, J. Alvear1, H. Pérez1, N. Díaz1, B. Leyton1, A. Almagià4, C. Larrain5, Y. Herrera1, J. Alvarez1-2, E. Hazbún1, Y. Orellana1

1University of Chile, Institute of Nutrition and Food Technology (INTA); 2Loma Linda University, School of Public Health, California, USA-Adventist University of Chile; 3University of Chile, Faculty of Medicine, Institute for Biomedical Sciences, Human Genetic Program; 4Catholic University of Valparaíso, Institute of Biology; 5German Clinic of Santiago, Department of Magnetic Resonance Imaging Service

Objective: The purpose of this study was to evaluate genetic and environmental influences on BMI in MZ and DZ twins.

Methods: A representative sample of 112 twin pairs, 66 MZ twin pairs (29 male and 37 female pairs) and 46 DZ twin pairs (20 male and 26 female pairs) reared together graduated from high school in the Chile’s Metropolitan Region on 2004 (mean age 18 y) was randomly chosen from the Chilean School-age Children Twin Registry. Zygosity was determined through the questionnaire method. BMI (weight/height$^2$) was compared with NCHS and Garrow Tables and nutritional diseases at an early age were registered. Energy intake and physical activity were evaluated according to FAO/OMS/UNU, 2002 pattern. Socioeconomic status was measured through the Graffar’s modified method. The field study was carried out during 2005-2006. Statistical analysis included MX statistical modelling and the Statistical Analysis System (SAS).

Results: Intraclass correlation ($r_i$) was higher in MZ ($r_i = 0.837$) compared with DZ ($r_i = 0.492$) ($p < 0.003$). Under the best fitting model, high heritability was observed for BMI (86.4%) and the contribution of non-shared environmental factors (13.6%) was negligible. In MZ and DZ twins, undernutrition at an early age and inadequate food habits, were the most relevant non-shared environmental factors that explains BMI. In MZ and DZ twins, energy intake ($r = -0.204$, $p < 0.05$ and $r = -0.226$, $p < 0.05$, respectively) and physical activity ($r = 0.042$, NS. and $r = -0.119$ NS, respectively) did not contribute to explain BMI.

Conclusion: In summary, our results suggest that BMI is highly heritable and non-shared environmental effects are small. These findings can be useful for public policies focused to prevent obesity and for genetic research.

Support: Supported in part by Grant S SOC 04/19-2, DI, University of Chile.
EFFECTS OF REGULAR PHYSICAL ACTIVITY ON HAEMODYNAMICAL, BIOCHEMICAL AND HAEMATOLOGICAL INDICES IN HEALTHY UNIVERSITY STUDENTS

P. Monostori, A. Baunok, E. Deak, S. Turi
Department of Paediatrics, University of Szeged, Szeged, Hungary

Objective: Regular physical activity is recommended in both the therapy and prevention of certain cardiovascular diseases. Young adulthood is critical with respect to long-term cardiovascular risk. We set out to compare haemodynamical, biochemical and haematological indices of students attending the Department of Physical Education and Sports Science and the Faculty of Medicine of the University of Szeged.

Methods: Twenty-one trained and 24 sedentary young adults (SP and NSP groups, respectively) were recruited for the exercise test, performed on a cycle ergometer (target heart rate (HR): 150/min, duration: 13 min, plus 2 min recovery). The haemodynamical indices (HR, HR recovery, blood pressure) were recorded before, during and after the exercise test. From blood samples drawn prior to and after cycling, levels of oxidized and reduced glutathione (GSSG, GSH) and endothelin-1 were measured, and the GSH stability test, based on an in vitro oxidative insult of the blood, was performed. For the determination of haematological parameters, fasting blood samples were obtained from 26 SP and 28 NSP students.

Results: The resting HR was lower in the SP group (p<0.01), and exhibited a negative correlation with the number of years spent with regular exercise (p<0.05, r=-0.5589). The 1 min HR recovery was faster in the SP subjects (p<0.01). The resting systolic blood pressure was lower in the NSP group (p<0.05) and was increased to a similar extent in both groups after the exercise test (p<0.05). The ratios GSSG/GSH, the concentrations of endothelin-1 and the residual levels of GSH after the in vitro oxidative insult were similar both before and after cycling in the two groups. The levels of total and LDL cholesterol were lower, whereas the haemoglobin values and haematocrits were higher in the SP subjects (all p<0.05).

Conclusions: Our results suggest that regular physical activity in young adulthood is primarily associated with favourable alterations of haemodynamical indices and lipid profile.

INTERNATIONAL COMPARISON OF BLOOD PRESSURE AND BMI VALUES IN SCHOOLCHILDREN AGED 11-16 YEARS

Á. Baráth1, K. Bodá2, M. Tichy1, É. Károly3, S. Túri1
1Department of Paediatrics, University of Szeged, Szeged, Hungary; 2Department of Medical Informatics, University of Szeged, Szeged, Hungary; 3County Hospital, Szolnok, Hungary

Objective: The present study comprised part of a larger cross-sectional survey performed in Hungary in the period 2005-2006, which was designed to reveal the representative age-, gender- and height-specific percentile values for the SBP and the DBP in Hungarian children aged 11-16 years. We now compare our findings with data on Italian, Israeli Arab, Ghanaian, Chinese and Turkish adolescents. A second aim was to determine the prevalence of overweight and obesity.

Methods: Analyses were performed on 14290 Hungarian children aged 11-16 years. All BP measurements were made with a validated, automated, digital device. Criteria recommended by international guidelines were used.

Results: The prevalence of overweight and obesity among the Hungarian children was found to be 23.4% (3347 adolescents; International Obesity Task Force criteria). The Hungarian, Italian and Israeli Arab adolescents have higher BP levels than their Ghanaian and Chinese counterparts. The Hungarian adolescents proved to be taller and heavier than their Turkish counterparts, and accordingly have higher SBP levels. The differences decreased with age.

Conclusions: Regional differences in morphometry (different prevalences of overweight and obesity) and the genetic background, disparate eating habits and other cultural factors may account for differences in BP levels during childhood. Thus, each individual population needs to use its own normal standards to define a measured BP level in childhood. Reference values for the SBP and the DBP were not previously available on Hungarian children (aged 11-15 years); accordingly, our study is the first to provide data on the BP distribution in a large cohort of Hungarian (and Central European) children and adolescents. As the prevalence of overweight and obesity is increasing worldwide, it is important that countries carefully monitor the weight and BP status of their children and adolescents.
NEW WHO GROWTH STANDARDS FOR CHILDREN (0-2 YEARS)

M. Paulová1, J. Vignerová1, L. Lhotská2, J. Riedlová3

1National Institute of Public Health, Prague, Czech Republic; 2Geneva Infant Feeding Association, Geneva, Switzerland; 33rd Faculty of Medicine, Charles University, Prague, Czech Republic

Objective: Increasing prevalence of obesity is one of the reasons why more attention is currently paid to the physical growth and nutrition of individuals in increasingly younger age groups. An essential condition for correct assessment of child growth is the use of adequate reference data, especially in the youngest age categories.

In 2006 World Health Organization (WHO) published new growth standards for children. Aware of an immense importance of breastfeeding for child health and development and for prevention of childhood obesity, WHO determined growth of a breastfed child as a norm. WHO now recommends implementation of these standards at national level, stressing, among others, their use for early detection and prevention of obesity. The purpose of presented study is to compare Czech national growth charts for children 0-2 years with the new WHO standards.

Methods: We compared the currently used Czech national growth charts (based on Nationwide Anthropological Survey 1991 and 2001) with the new WHO standards for body length, weight, BMI and weight-for-length.

Results:
1/ In case of national implementation of the WHO standards, we remain concerned about over reporting in length for majority of children and its likely effect on the assessment of all related characteristics.
2/ We are concerned about the impact of the significantly different trajectory for infants < 6 months in the WHO charts when used in practice.
3/ The use of the WHO charts for BMI may contribute to prevention of overnutrition and obesity in Czech Republic.

Conclusions: Despite evident positive features of the new WHO standards, at present we do not consider adoption of the standards for assessment of child growth in their entirety appropriate. On the other hand, it would be desirable to test the WHO standard and the results of our comparison on a sample of Czech children exclusively breastfed and breastfed for an extended period. Simultaneously, it is an imperative to promote correct use of growth charts in the current pediatric practice.

This research was supported by Health programmes of Ministry of Health, Czech Republic, 2007.

ASSESSMENT OF WAIST HIP RATIO AND ITS ASSOCIATIONS WITH DEMOGRAPHIC FACTORS AND NUTRITION IN A TURKISH POPULATION (ANKARA CITY, TURKEY)

N. Yabancı1, E. Göcgeldi2, I. Şimşek1

1Dep of Food and Nutrition Education in Vocational Educational Faculty in Gazi University, Ankara, Turkey; 2Dep of Public Health in Gulhane Military Medical Academy, Ankara, Turkey

Objective: Body mass index (BMI), waist circumference and waist hip ratio (WHR) are the most commonly used tools for assessing obesity due to their simplicity, low cost, and strong correlation with body fat. Our aim was to assess WHR and its association with demographic factors and nutrition in the Ankara region.

Methods: The cross-sectional study included 1080 adults (540 men, 540 women) ranging in age from 20 to 65 old studying in Ankara, Turkey. Weight, height, waist and hip circumferences were taken for each subject using standard protocol. BMI, WHR were calculated using standard formulas. We evaluated the effects of demographic factors, energy and nutrient intakes on WHR.

Results: The prevalence of obesity (BMI ≥ 30.0 kg/m²) was 9.9%: 8.9% in men and 10.9% in women. The combined prevalence of overweight (BMI between 25.0-29.9 kg/m²) and obesity was 44.6%. The prevalence of central obesity was 23.7%: 11.3% in men (WHR ≥ 1.0), 36.1% in women (WHR ≥ 0.85). The mean value of BMI and WHR in men (25.3 ± 3.3 kg/m²; and 0.90 ± 0.08) was significantly higher than in women (24.4 ± 4.4 and 0.81 ± 0.09, respectively) (p<0.001). WHR increased with age and BMI (p<0.001). Central obesity was positively associated with daily energy intake, percentage of energy from fats, saturated fat and sugar intakes, whereas it was negatively associated with daily fiber intake.

Conclusions: The rate of central obesity in relation to metabolic syndrome should be decreased. Healthy nutritional habits and physical activity are very important both obesity and central obesity.
Effects of Balance Improvement Program in Overweight and Obese Postmenopausal Women

G. Koroknai1, D. Jobst1, B. Molics1, G. Horváth2, J. Kránicz1,2

1Institute of Physiotherapy and Dietetics, Faculty of Health Sciences, University of Pécs, Pécs, Hungary; 2Department of Orthopedics, Medical Faculty, University of Pécs, Pécs, Hungary

Objective: Due to the increased number of fractures in osteoporotic postmenopausal women, apart from weight control, coordination exercises play an important role in prevention. Our aim was to investigate the possible benefits of a balance improving program using objective methods, in overweight and obese women.

Methods: 13 untrained patients aged 57.46 (SD: 4.37) years, having 91.67 (SD: 6.95) kg body weight and BMI 34.36 (SD: 4.28) kg/m² were included in the study. Our program lasted 12 weeks in 24 sessions. 50 minute training sessions each, increasing in stepwise fashion during the program: low-impact and pulse-controlled aerobic trainings were also supplemented by static and dynamic balance improving exercises.

Before and after the program, coordination was assessed using Bretz-type stabilometric device. Body weight was checked, body fat percentage was measured using monophasic bio impedance scale. The static equilibrium was assessed with stabilometer with the Romberg test. The dynamic equilibrium was assessed with the device’s five other programs. Our results were analyzed with paired 1 tail-test with Statistics for windows program.

Results: There was no statistically significant difference observed in static equilibrium (p>0.05). Significant difference was detected between the patients regarding dynamic exercises. (p<0.05).

The following parameters significantly decreased at the end of the therapy (p=0.00): body weight mean decreased from 91.67 kg to 89.06 kg, the BMI mean from 34.366 kg/m² to 33.37 kg/m², body fat mean from 45.39% to 44.10%.

Conclusions: Improvement in dynamic equilibrium is possibly due to the greater number of dynamic exercises in our program.

Dietary Habits and Body Size Satisfaction in Young Athletes

R. Mikulán1, B. Picó2

1National Institute of Sport Medicine, Budapest, Hungary; 2Dept of Psychiatry, University of Szeged, Faculty of Medicine, Szeged, Hungary

Objective: Optimal nutrition is necessary for good performance in sport. In our study we examined eating attitude and body size satisfaction in young athletes.

Methods: The study was carried out in 46 male and 48 female 14-18 years old athletes. The subjects completed a questionnaire regarding dietary habits, the regularity (the occurrence or skipping of main meals) and the composition (fast food, high sugar content beverages, fruits, vegetables) of meals, frequency of snacking, willingness to take the appropriate quantity and quality of food, body size satisfaction and dieting behaviour.

Results: Boys ate more regularly than girls. If any meal is skipped that is usually the breakfast. Great majority of the subjects ate fruits and vegetables at least once a day, fast food is eaten only rarely. A lot of candy is consumed. They drink high sugar content beverages very frequently. Majority of them judge their body weight to be optimal. Girls are less satisfied with their body size than boys. More girls desire to be slimmer than boys. Girls diet more often than boys. The level of performance and frequency of training has no relation to the eating attitude.

Conclusions: The dietary habits of athletes are not characterized by health risk nutrition.
THREE SESSION MODERATE PHYSICAL ACTIVITY IS ENOUGH TO CHANGE CARDIO RESPIRATORY FITNESS AND BODY COMPOSITION

A. Jafarī, M. Moradichaleshtori, J. Moradichaleshtori
1Department of physical education Islamic Azad University, Shahrekord Branch, 2Faculty of physical education and sport sciences, Tehran University, 3Islamic Azad University, Borojerd Branch

Objective: Change in body composition is relate more to amount than to intensity of exercise but many of researches suggest that high-intensity training is more effective in improving cardiopulmonary (VO2max) fitness than moderate-intensity training. Many of over weight women can not train in intensive level and they prefer moderate level of physical activity. The goal of this study was to assess the effects of amount of ergometer cycle training on VO2max and body composition in over weight women.

Methods: Forty-one sedentary premenopausal women, age 25 to 45 years, were randomly assigned in three groups. Cycle ergometer training consisted of 1 day per week for group A, 2 days per week for group B and 3 days per week for group C. Participants trained 60 min in any session with moderate intensity (50-60% VO2max) for 12 weeks. Participants were counselled not to change their diet. There were no significant differences among variables in three groups at baseline.

Results: After 12 weeks ANOVA test indicated there was significant difference among mean body composition among three groups. Use of Tukey post-hoc tests showed that difference in theses groups is because of group C. Paired T test showed that there was significant difference between mean body composition (p<0.01) in group C after that, we use theses tests for VO2max too. Paired T test showed that VO2max in group B and C improve 12% and 21% (p<0.01) respectively. But in group A it was not changed significantly.

Conclusions: These findings indicate that three days in week with 60 min of moderate-intensity cycle ergometer training is sufficient to improve body composition and VO2max in over weight women. With two days training (120 min) in week only VO2max improve so two days regular training without change in body composition is a useful strategy for improving VO2max in overweight women. These findings strongly suggest that, absent changes in diet, a higher amount of activity is necessary for improve in body composition and VO2max.

PREVALENCE OF OVERNUTRITION IN CHILDREN ADMITTED IN A PAEDIATRIC DIGESTIVE ENDOSCOPY UNIT: A 5-YEARS STUDY

V. Hurduc, A. Manda, D. Pleșca, D. Dragomir
1Dr. Victor Gomoiu Clinical Children’s Hospital, Carol Davila University of Medicine and Pharmacy, Bucharest, Romania; 2Paediatric Department, Medicover, Bucharest, Romania

Objective: Lifestyle changes and type of food consumption have led to unexpected modifications of nutritional status of children. The aim of this study was to assess the nutritional profile in children who underwent esophagogastroduodenoscopy (EGD) for various reasons, mostly for uninvestigated dyspepsia.

Methods: This is a retrospective study of 469 children (313 girls, mean age 13.6 years, range 2-18 years) submitted for the first EGD in our unit during the last 5 years. Socioeconomic status, dietary and clinical data were analyzed. Weight, height and body mass index (BMI) for age were recorded based on growth charts provided by the Center for Disease Control(2000).

Results: Assessment of nutritional status of the patients had the following repartition: 135 children (28.78%) were underweight (BMI less than 5th percentile), 266 (56.72%) were healthy, and 40 (8.52%) were at risk of becoming overweight and 28 children (5.98%) were overweight (BMI greater than the 95th percentile). The underweight prevalence rate was directly correlated with age. The prevalence of overnutrition (children at risk of becoming overweight and overweight) was higher in primary school group (47.5% and 57.14%, respectively). This study revealed a high prevalence of both ends of the spectrum of poor nutritional status represented by undernutrition (28.78%) and overnutrition (14.5%). Of the 469 children, 286 (60.98%) had documented H pylori infection. The rate of H pylori infection in undernutrition and overnutrition children was 27.62%, respectively 16.78%.

Conclusions: This study shows a high prevalence rate of overnutrition in children with abdominal complaints and confirms that “nutritional paradox” is most frequently found in developing countries.
OBESITY AND FEMALE REPRODUCTIVE CAPACITY

M. Leppée1, N. Perković1, M. Eric2, D. Štimac1, J. Culig1, L. Paležac3

1Department of Social Medicine, Zagreb Institute of Public Health, Zagreb, Croatia; 2Department of Anatomy, Medical School of Novi Sad, Novi Sad, Serbia; 3Medical School of Zagreb, Zagreb, Croatia

Objective: Obesity is becoming increasingly common and is recognized as one of the major public health problem in Croatia. The aim of the study was to researched relationship between obesity and female repetitive capacity.

Methods: The study was carried out from period 2003-2007 in a typical sample of 1036 women of reproductive age. Most of the study women (55.3%) were from Northwest Croatia with the City of Zagreb and the rest were from Dalmatia (31.7%) and Slavonia (13.0%).

Results: A history of childbirth was recorded in 231 (53.3%) of 433 women with increased BMI and 343 (56.9%) of 603 women with normal BMI. According to regions, the percent of women with elevated BMI and a history of childbirth was 52.3%, 57.9% and 52.9% in Northwest Croatia, Dalmatia and Slavonia, respectively. Similar figures were recorded for the women with a history of childbirth and BMI within the normal limits: 57.1%, 57.0% and 56.0% in these three regions, respectively.

Conclusions: There was no statistically significant difference in reproductive capacity between the women with normal BMI and those with elevated BMI. There was no difference among various regions of Croatia either, although it may have been expected due to the considerable variation in the level of their cultural and economic development.

EVALUATION OF EFFECTIVENESS OF A LIFESTYLE MODIFICATION PROGRAM ON OBESITY BASED LIPID PROFILE IN CHD PATIENTS

J. Shahamfar1, N. Aslanabadi2, M.R. Shahamfar3

1Tabriz University of Medical Sciences, School of Medicine, Department of community medicine, Tabriz, Iran; 2Tabriz University of Medical Sciences, Department of Cardiology, Shahid Madani Heart Hospital, Tabriz, Iran; 3Tabriz University of Medical Sciences, School of Dentistry, Tabriz, Iran

Objective: To evaluate the effect of lifestyle modification on lipid profile of coronary heart disease patients.

Methods: We evaluated effectiveness of a behavior educational intervention on reducing of Lipid profile in CHD patients. A total of 100 patients (50 experimental, 50 control) aged less than 65 years were recurred for this study. A behaviorally based lifestyle modification program was performed in Experimental group patients while control patients received ordinary hospital care.

Setting: Coronary Care unit, cardiology department, Shahid madani heart hospital, TABRIZ.

Exclusion Criteria: All severely ill patients, patients aged more than 65 years and those out of TABRIZ.

Statistical analysis: SPSS.12 software was utilized

Results: The results of this study showed that LDL cholesterol levels decreased from mean of 146.07 mg/dl at baseline to 134.82 mg/dl after one year (P<0.05). Total cholesterol decreased from a mean of 211.94 at baseline to 188.86 mg/dl after one year (P<0.05) with 95% Confidence interval of the differences. HDL cholesterol Levels increased from 34.41 mg/dl to 38.43 mg/dl after modification of lifestyle. (P<0.05) Mean weight decreased from 77.45 at baseline to 73.88 after intervention. Waist/hip ratio decreased from 108.67 to 0.99 after education (p<0.05).

Conclusions: We found that the lifestyle modification program in experimental group can reduce the Lipid profile of patients without increasing cardiac morbidity and mortality.

Key words: Coronary artery disease, Lifestyle, Lipid profile, modification.
ANTHROPOMETRIC PARAMETERS AND GENE FOR PERILIPIN IN THE CZECH POPULATION

V. Adámková1,2, J.A. Hubáãek1,2, R. Bohuslavová1, I. Králová-Lesná1, M. Velemínsk˘2, P. Zimmelová2, V. Lánská1

1Institute for Clinical and Experimental Medicine, Prague, Czech Republic; 2South Bohemia University, České Budějovice, Czech Republic

Objective: The obesity is a major healthy problem in industrialised countries. Also low birth weight and short birth height are discussed like possible risk factors for obesity development, but the definitive conclusion can not be drawn yet. Also the possible effect of the perilipin (major protein of the lipid vacuoles in adipocytes) variants on obesity development is not clear.

Methods: We have analysed 1473 individuals from two Czech districts (540 males and 933 females, aged 18-45 years). Birth weight, birth length, body weight, height, waist, hip and BMI were correlated with two perilipin variants (A13041G -rs2304795 aA14995T -rs1052700). ANOVA, Levenes, Brown-Forsyth and Welch tests were used for statistical evaluation.

Results: Birth length is significantly higher in individuals with AA genotype of the rs1052700 variant in both districts (p < 0.05). Other parameters were not significantly influenced by perilipin variants. Individuals with genotypes GG (rs2304795) and AA (rs1052700) have (borderline nonsignificant) higher BMI than others.

Conclusions: TT carriers of the rs1052700 variant in perilipin gene have lower birth length, but the adult height was the same like in others. Other anthropometric parameters are not associated with the perilipin variants.

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THE SOCIAL STIGMA OF OVERWEIGHT PEOPLE

L. Wisniewska

The John Paul II Catholic University of Lublin, The Institute of Psychology, Lublin, Poland

Objective: The aim of this presentation is to emphasize the problem of stigmatization, devaluation and social exclusion of obese people on the basis of recent literature.

Methods: According to many psychological research carried out in different countries, the problem of obesity can not be considered without its psychosocial consequences. The different experiments, as well as other inquiries have shown that obesity can be a reason of psychological, social and even financial difficulties.

Results: It is shown that obese people, especially youth and women are less likely to get a job, have friends or graduate from university than their non-obese peers. They are also teased by their families, colleagues and medical staff. Stigmatized people have lower self-esteem and think that they are worse than others. They face problems in everyday functioning and with coping with daily duties and challenges.

Conclusions: With all medical consequences and threats, sometimes the psychological and social costs of obesity are equally significant. Obesity is an illness that in common belief, can be easily controlled and managed. Thus, obese people are discriminated. The society treats too many kilograms as those people’s own fault. Moreover, they can be easily seen and targeted in the society because their surfeit of weight is hard to be hidden. However, researches are mainly conducted in western societies. The question remains to what extent the results can be transferred directly into central and eastern European countries. Even though, the merging of different cultures and influence of western patterns of life can be easily found all over the Europe, obesity with its psychosocial consequences is still a new problem.
**COPING STYLES IN OBESE YOUTH**

L. Wisniewska¹, S. Tucholska¹, G. Kalmus²

¹Institute of Psychology, The John Paul II Catholic University of Lublin, Poland; ²Children’s Clinical Hospital, Ciechocinek, Poland

**Objective:** The aim of this poster is to present coping styles among obese youth and differences between overweight adolescents and their peers with normal weight in the area of coping.

**Methods:** The obese youth treated in slimming rest cure in one of the Polish spa (clinical group) and pupils from 2 different schools (control group) filled in following questionnaires: CISS by N.S. Endler and J.D. Parker (translated and adapted by Strelau and co-workers) and Stressverarbeitungsfragebogen by W. Janke, G. Erdmann and W. Boucsein (translated by E. Januszewska). Both of them were in Polish. The were 81 participants, 32 boys and 49 girls, in clinical group and 85, 35 boys and 50 girls in the control group. The average age of group was 13.26 years in the former group and 13.15 in the latter.

**Results:** There were only some statistical tendencies for differences between obese and non-obese youth in coping styles. More significant differences were within the adolescents with obesity. First of all, boys differed from girls in coping styles. Girls are more emotional, aggressive toward themselves and other people. Moreover, by using statistical methods of data analysis, three groups with different coping styles were separated from the obese youth. These three groups were named as following: • group with dominant avoidance-task-oriented style with low emotional coping (youngsters usually seek other’s help or use food, shopping, watching TV as a self-consolation, they don’t focus on their own thoughts or feelings), • group with dominant task-oriented style with general low coping activity (concentrate on dealing with problem, they try to change the situation), • group with mixed style with high coping activity (youngsters choose different coping strategies, none of them is dominant). The number of adolescents are almost equal: 25 in the first group, 27 in the second and 29 in the third.

**Conclusions:** Lacking in coping abilities and using food as a self-consolation, have been recognized as one of the causes of obesity. Differences between obese and non-obese were only partially confirmed in the study, thus, more important seems to be that there are some differences within the obese adolescents. Whereas group of obese youth has been perceived as a homogenic one due to the fact of shared illness, the inquiry has shown that it can be considered as heterogenic. Its variety has been also revealed in many other studies, mainly in western society. This fact can determine further research in that area, considering more variables.

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**OBESE CHILDREN EAT SWEETENED FOODS DIFFERENTLY FROM LEAN CHILDREN**

Y.A. Jang¹, J.J. Moon¹, H.S. Lee¹, H.J. Lee¹, Y. Lee¹, D.H. Kim¹, H.S. Nam², E.J. Lee², J.W. Kim², H.K. Park², C-I Kim³

¹Center for Nutrition Policy & Promotion, Korea Health Industry Development Institute, Seoul, Korea; ²Dept of Nutrition Evaluation, Korea Food & Drug Administration, Seoul, Korea

**Objective:** This study was conducted to find differences in eating habits between obese children and lean children by comparing the frequency of sweetened food consumption.

**Methods:** With a nationwide sampling of 120 survey sites/3,600 households, about 2,250 children under 20 years were subjected to dietary interviews and 1,573 responded. For infants and young children, proxy response was allowed and trained dietitians performed face-to-face interviews for the consumption frequency of specific sweetened food items using a structured food frequency questionnaire from November 2007 through February 2008 in Korea. The frequency results were converted to daily consumption frequency for each food item and compared among different weight groups by sex and age using SAS.

**Results:** The response rate was about 70% and more boys responded than girls (869 vs. 704). While 7.6% of children were lean, 11.4% were overweight and 7.5% were obese. Among school age (7-12 yrs.) boys, lean (L) children consumed breakfast cereal significantly more often than obese (Ob) children (p<0.05). However, Ob boys consumed pies and soft drinks more frequently than L boys (p<0.05). And Ob adolescent (13-19 yrs.) boys consumed sweetened sauces/dressings 3 times frequently than L adolescent boys (0.189 vs. 0.063, p<0.05). Among school age girls, on the other hand, consumption frequency for breakfast cereal tended to be higher in Ob girls than L girls. Also, Ob girls consumed sandwich style cookies and doughnuts more frequently than L girls (p<0.05). Among school age girls, on the other hand, consumption frequency for breakfast cereal tended to be higher in Ob girls than L girls. Also, Ob girls consumed sandwich style cookies and doughnuts more frequently than L girls (p<0.05). There was no significant difference in mean consumption frequency of sweetened foods between Ob and L adolescent girls.

**Conclusions:** This study revealed that obese children eat differently from their counterparts. They eat fatty/greasy & sweetened foods more frequently than lean children. It seems that intervention and/or nutrition education focusing on the fat content along with sugar content of foods will help children staying fit and prevent obesity.
**COST BURDEN OF OBESITY**

G. Gyenis¹, L. Halmy², K. Joubert³

¹Department of Biological Anthropology, Faculty of Science, Eötvös Loránd University, Budapest, Hungary; ²Hungarian Society for Study of Obesity, Budapest, Hungary; ³Demographical Research Institute, Central Hungarian Statistical Office, Budapest, Hungary

**Objective:** Obesity involves significant social costs in terms of the risk increase of severe diseases and mortality, healthcare costs to treat medical, psychological and psychiatric comorbidities, as well as reduction of employment accessibility, in wages and in social status, too. E.g. in the U.S., national costs attributed to both overweight and obesity medical expenses accounted for 9.1 percent of total medical expenditures in 1998 and may have reached as high as $78.5 billion ($92.6 billion in 2002 dollars). Therefore the purpose of this presentation is to highlight the danger of the obesity both in the highly industrialised and the developing countries of the world.

**Methods:** By the huge amount of data published during the last decades it can be seen the growing prevalence of obesity in all societies of the world and not only in adulthood, but what is more dangerous, in childhood, too. E.g. the childhood obesity in the U.S. is already a critical public health threat, because the prevalence of it has more than doubled for preschool children aged 2-5 years and adolescents aged 12-19 years since the 1970s, and it has more than tripled for children aged 6-11 years during that timeframe. At present, approximately nine million children over six years of age are obese.

**Results:** The obesity epidemic is more than an individual or a public health crisis, it is an economic crisis, too. The cost burdens of obesity include the pauperization caused by the reduction of the income and personal savings, significant impairments in quality of life, lowered self-esteem, higher rate of depression, continuously rising direct and indirect medical cares, workers’ compensation, lost productivity, and premature death.

**Conclusions:** Without the common actions of the individuals and the societies (i.e. prevention programmes starting already from childhood, appropriate caloric intake, proper weight control, physical activity during the whole life, and treatment and management of obesity within national health system) obesity will become the most dangerous epidemic/pandemic of the people all over the world in the 21st century.

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**NEW POSSIBILITY IN THE FUNCTIONAL DIAGNOSTICS OF THE SPINE OF OVERWEIGHTED PATIENTS**

G. Téglásy¹, E. Horák²

¹International Health Institute, Budapest, Dept. Internal Med.; ²Mediglobe Kft, Bicske

**Objective Aim of the work is to quantify negative impaction of obesity and sedentary lifestyle on functionality of the spine before the low back pain will beginning.**

**Methods:** The Spinal Mouse is such a functional spine examining measuring apparatus, based on electromechanic principle, that measures with an attached program the sagittal and frontal curvatures of the spine and visualizes them relating the dorsum and lumbar part of the spine. It has an important benefit in the everyday, by the check-up of the spine.

**Materials:** We made screening examination with the Spinal Mouse machine on 28 inactive overweighted citizens, who did sedentary jobs (clerks). The distribution according to genders was 12 men (average age: 38.92 y SD: 2.35) and 16 women (a.age: 36.75 y SD:1.8). The participants’ ages of both groups were between 35 to 42 years, so the average age of the whole group was 37.68 years, SD: 2.33. The examined persons BMI value: 30.19 SD:2.60 (men: 29.63 SD:3.37, women: 30.61 SD:1.84.)

**Results:** Among the examined people in 24 cases (86 %) founded increased dorsal kyphosis Th 5-10 segments, which exceeded the age group’s reference data territory. Pathological mobility (hypermobility) of lumbar spine: 25 cases (89%) Non-harmonic distribution of Range of Motion between segments: 26 cases (93%) Instability in lumbar spine: 16 cases (57%)

**Conclusions:** 3 pathological ratios have been occurred in very significant rate. We found instability more than at their half of the examined. The examination is suitable for define the amount of segments by the formed angles of vertebras. The machine could detect factual the deformity and the change of functions in early phase without X-ray radiation. With the help of the spinal mouse machine such functional changes can early measured like scoliosis, which has been highly evolved among the overweighted population. If the bodyweight reduction, the physical activity and the remedial gymnastics starts in time, the stability and the flexibility of spine could be restored, and the progression could be preventable.
Objective: The purpose of this study was to determine waist circumference distribution in the Czech population, its relation to socioeconomic factors, and to estimate the change in waist circumference between years 2000/2001 and 2005. Waist circumference was used as a marker of body fat distribution and an alternative indicator of obesity. Waist circumference is considered as independent risk factor of metabolic and cardiovascular diseases.

Methods: The quota representative sample of Czech adults was examined in November 2005 and in 2000/2001. The total number of subjects was 2096 in 2005 and 3053 in 2000/1. Subjects were selected according to the following quotas: gender, age, education, region, and size of residential location. Body height, weight and waist circumference (in the horizontal line midway between the upper iliac crest and lower rib) were measured by trained investigators, and BMI was calculated. Each person was interviewed face-to-face to obtain personal data concerning sociodemographic characteristics. Pearson’s chi-square test and t-test for unpaired data were used for statistical analysis.

Results: An average waist circumference of the Czech population is 88.3 cm, which is 2.5 cm longer than in 2000/2001. Normal values (<94 cm for men and <80 cm for women) were found in 52% men and 42% women, while highly risk values (≥102 cm, resp. ≥88 cm) in 25%, resp. 37% of respondents. In comparison to years 2000/2001, there was a shift to the higher risk zones. Regarding demographic factors, normal waist circumference was more frequent at people younger than 44 years, men, and people with higher education. On the other hand, highly risk values were observed more often at women, people older than 45 years, and people with primary education only.

Conclusions: Between years 2000/1 and 2005, waist circumference of the Czech population has increased in both women and men. According to this study, the education level is related to waist circumference – the higher the education the shorter waist circumference.
VISFATIN, ADIPONECTIN, RESISTIN AND LEPTIN IN METABOLIC SYNDROME

E. Semik-Grabarczyk, B. Zahorska-Markiewicz, M. Olszanecka-Glinianowicz, P. Kocelak, J. Janowska
Department of Pathophysiology, Medical University of Silesia, Katowice, Poland

Objective: The aim of the study was to determine serum concentrations of visfatin, resistin, leptin and adiponectin in obese women with and without metabolic syndrome (MS).

Methods: Study group involved 84 obese women, who on the basis IDF 2005 criteria were divided into subgroups with MS – A (n =60; age 54.4±7.2 y; BMI 39.1±5.4 kg/m²) and without MS – B (n=24; age 50.7±9.8 y; BMI 35.1±4.5 kg/m²). Serum concentrations of visfatin, resistin, leptin and adiponectin were assayed with ELISA kits.

Results:

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<tr>
<td>Visfatin (pg/ml)</td>
<td>35.7±11.7</td>
<td>26.5±6.8***</td>
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<tr>
<td>Resistin (ng/ml)</td>
<td>16.5±4.6</td>
<td>13.7±3.2*</td>
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<tr>
<td>Leptin (ng/ml)</td>
<td>34.5±14.8</td>
<td>33.7±12.7</td>
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<td>Adiponectin (ng/ml)</td>
<td>10.8±4.2</td>
<td>8.3±2.2*</td>
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*p < 0.05; *** p <0.0001

There were no correlations between serum concentrations of study adipokines.

Conclusions: In subjects with MS there are increased serum concentrations of visfatin and resistin, two adipokines with potential opposite action. It seems that increased visfatin level may be contrregulatory mechanism of preventing of resistin insulinresistant action.

VISFATIN AND C - PEPTIDE CONCENTRATIONS IN METABOLIC SYNDROME

B. Zahorska-Markiewicz, M. Olszanecka-Glinianowicz, P. Kocelak, E. Semik-Grabarczyk, J. Janowska
Department of Pathophysiology, Medical University of Silesia, Katowice, Poland

Objective: The aim of the study was to asses possibly connections between serum concentrations of visfatin and C - peptide in obese women with and without metabolic syndrome (MS).

Methods: Study group involved 84 obese women, who on the basis IDF 2005 criteria were divided into subgroups with MS – A (n =60; age 54.4±7.2 y; BMI 39.1±5.4 kg/m²) and without MS – B (n=24; age 50.7±9.8 y; BMI 35.1±4.5 kg/m²). Serum concentrations of visfatin was assayed with ELISA kits. Insulin and C – peptide were determined by radioimmunoassay and glucose by colorimetric method. HOMA index was calculated with formula.

Results:

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<tr>
<td>Visfatin (ng/ml)</td>
<td>35.7±11.7</td>
<td>26.5±6.8***</td>
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<tr>
<td>Insulin (mIU/l)</td>
<td>16.3±10.5</td>
<td>13.7±3.2*</td>
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<tr>
<td>Glucose (µmol/l)</td>
<td>6.5±1.6</td>
<td>5.1±0.6***</td>
</tr>
<tr>
<td>C-peptide (ng/ml)</td>
<td>1.4±0.7</td>
<td>0.8±0.3***</td>
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<tr>
<td>HOMA</td>
<td>48±3.7</td>
<td>1.7±1.1***</td>
</tr>
</tbody>
</table>

*p < 0.05; *** p <0.0001

In all study group we observed positive correlation between serum concentration of visfatin and C-peptide and glucose levels.

Conclusions: It seems that increased visfatin level in MS is an answer on disorder action of insulin.
**VISFATIN AND INFLAMMATION IN OBESITY**

M. Olszanecka-Glinianowicz, B. Zahorska-Markiewicz, E. Semik-Grabarczyk, P. Kocelak, J. Janowska
Department of Pathophysiology, Medical University of Silesia, Katowice, Poland

Objective: The aim of the study was to assess possibly connections between serum concentrations of visfatin and TNF system in obese women with and without metabolic syndrome (MS).

Methods: Study group involved 84 obese women, who on the basis IDF 2005 criteria were divided into subgroups with MS – A (n = 60; age 54.4 ± 7.2 y; BMI 39.1 ± 5.4 kg/m²) and without MS – B (n=24; age 50.7 ± 9.8 y; BMI 35.1 ± 4.5 kg/m²). Serum concentrations of visfatin, TNF-α and TNF soluble receptors were assayed by ELISA kits.

Results:

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<tr>
<td>Visfatin (ng/ml)</td>
<td>35.7 ± 11.7</td>
<td>26.5 ± 6.8***</td>
</tr>
<tr>
<td>TNF-α (pg/ml)</td>
<td>6.3 ± 2.1</td>
<td>6.2 ± 5.2</td>
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<tr>
<td>sTNFR1 (pg/ml)</td>
<td>1473.0 ± 523.9</td>
<td>1117.9 ± 451.2**</td>
</tr>
<tr>
<td>sTNFR2 (pg/ml)</td>
<td>2240.0 ± 716.2</td>
<td>1804.6 ± 608.4*</td>
</tr>
<tr>
<td>HOMA</td>
<td>4.8 ± 3.7</td>
<td>1.7 ± 3.1***</td>
</tr>
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</table>

*p < 0.05; *** p <0.0001

In all study group we observed positive correlation between serum concentrations of visfatin and TNF-α (r=0.27, p<0.01) and between HOMA index and TNF-α level (r=0.31, p<0.005).

Conclusions: There is connections between serum concentrations of visfatin and TNF-α and it seems that stimulation of secretion visfatin by TNF-α may be one of beneficial counterregulatory mechanism.

**IMPACT OF HIGH-FAT DIET AND ESTROGEN REPLACEMENT ON METABOLIC PARAMETERS OF OVARIECTOMIZED MICE**

R. Matyášková, J. Maixnerová, D. Blokešová, M. Haluzík, B. Železná, L. Maletínská

1Institute of Organic Chemistry and Biochemistry, Academy of Sciences of the Czech Republic; 2Third Department of Medicine, First Faculty of Medicine, Charles University, Prague. Czech Republic

Objective: Ovariectomized (OVX) mice with diet-induced obesity (DIO) can serve as a model of postmenopausal women with metabolic syndrome. This study shows how ovariectomy, high-fat (HF) diet or their combination affect metabolic parameters in female mice and their responsiveness to centrally administered leptin. Effect of estrogen replacement on metabolic parameters was also tested.

Methods: C57BL/6 female mice were fed with either standard chow diet or HF diet containing 9% or 60% of fat, respectively. At the age of five weeks, mice were ovariectomized. Estrogen was administered subcutaneously one month before food intake experiment in a 4-day cyclic regimen. Leptin was administered centrally to the third ventricle and food intake was measured for 36h after injection. Metabolic parameters were determined in the blood sera afterwards.

Results: OVX mice supplemented with estrogen had their eating pattern reversed to that of the cycling mice. Although OVX mice on HF and standard diet did not differ in their caloric intake from controls, OVX mice on HF diet accumulated 8 times more fat than OVX mice on standard diet, developed liver steatosis, had significantly elevated glucose and insulin levels and attenuated sensitivity to anorexigenic effect of centrally administered leptin. All these parameters were normalized after 4 weeks of estrogen treatment. HF diet lowered resistin levels and estrogen attenuated adiponectin levels in OVX mice.

Conclusions: OVX mice were prone to HF induced obesity with metabolic syndrome and develop central leptin resistance. These metabolic parameters were normalized by estrogen treatment.

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EFFECT OF TRANSGENIC RESISTIN EXPRESSION ON SKELETAL MUSCLE INSULIN SENSITIVITY AND PROTEIN KINASE C

I. Marková1,2, O. Nováková2, F. Novák1, L. Kazdová1, M. Pravenec3

1Institute for Clinical and Experimental Medicine, Prague, Czech Republic; 2Faculty of Science, Charles University, Prague, Czech Republic; 3Institute of Physiology, Czech Academy of Sciences, Prague, Czech Republic

Objective: Resistin has been proposed as adipokine involved in the etiology of insulin resistance. However, the mechanism(s) responsible for impaired glucose metabolism in skeletal muscle is still unclear. In this study we investigated if increased expression of resistin in adipose tissue is related to protein kinase C (PKC) activation and cellular localization in skeletal muscle.

Methods: One year old male SHR expressing the mouse resistin gene under control of aP2 promoter were used. Control group comprised age-matched genetically identical rats with absence of the transgene. All animals were fed a diet with 60% fructose for 2 weeks before the end of the study. Tissue sensitivity to insulin action was measured in vitro without or with insulin (250 µU/ml) according to basal and insulin-stimulated 14C-U-glucose incorporation into muscle glycogen and oxidation to CO2.

Results: Transgenic rats displayed higher body weight (389 ± 6 vs 370 ± 5 g, p<0.05) and elevated epididymal fat pad weight (0.922 ± 0.035 vs 0.709 ± 0.043 g /100g BW, p<0.02) compared to the control group. Serum triglyceride concentrations were increased (1.99 ± 0.15 vs 1.34 ± 0.11 mmol/l, p < 0.01). The transgenic expression of resistin substantially impaired the tolerance to the oral glucose load (AUC0-120: 1026 ± 131 vs 725 ± 0.02 mmol/l/120 min., p<0.02) and increased hyperinsulinemia.

Expression of transgenic resistin was associated with almost total adipose tissue resistance to insulin action. Skeletal muscles isolated from transgenic rats exhibited a significant decrease in glucose oxidation, measured in vitro according to 14C-U-glucose incorporation into CO2. Study of insulin signalling indicated that there was a significantly higher protein content of PKC θ isoform by 39% (p<0.05) and 318% (p<0.01) in membrane and cytosolic fraction, respectively.

Conclusions: The results indicate that chronic transgenic expression of resistin gene was associated in one-year old animals with increased serum triglycerides, hyperinsulinemia, markedly impaired glucose tolerance and suggest possible involvement of PKC θ activation in development of insulin resistance.

This study was supported by grant NR/9387-3 from IGA MH CR

EXERCISE CAPACITY IN OBESE WOMEN IN COMPARISON TO LEAN CONTROL

A. Zak-Golab1, B. Zahorska-Markiewicz1, J. Langfort2, P. Kocelak1, M. Holecki1, K. Mizia-Stec3, M. Olszanecka-Glinianowicz1, Z. Mucha1

1Department of Pathophysiology, Medical University of Silesia, Katowice, Poland; 2Department of Physiology, Academy of Physical Education, Katowice, Poland; 3Department of Cardiology, Medical University of Silesia, Katowice, Poland

Objective: The aim of the study was to recognize the differences in anaerobic threshold (AT) and maximal exercise capacity in obese women in comparison to normal-weight control.

Methods: 42 obese women (age 30.5 ± 6.9 years; BMI 33.6 ± 3.7 kg/m2) and 19 of the control group (mean age 27.6 ± 7.0 years; BMI 21.2 ± 1.9 kg/m2). Each women performed incremental ramp exercise test up to exhaustion on cycle ergometer. The anaerobic threshold was determined and some parameters were noted on the peak of exercise.

Results:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Obese (n=42)</th>
<th>Control (n=19)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT [l/min]</td>
<td>62.24±14.56</td>
<td>63.4±12.67</td>
<td>NS</td>
</tr>
<tr>
<td>AT/BW [ml/kg/min]</td>
<td>0.68±0.17</td>
<td>1.11±0.20</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>AT/FFM [ml/kg/min]</td>
<td>1.20±0.30</td>
<td>1.5±0.30</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>HR [l/min]</td>
<td>173.7±10.8</td>
<td>179.9±6.5</td>
<td>p&lt;0.05</td>
</tr>
<tr>
<td>VO2 peak [l/min]</td>
<td>1.67±0.32</td>
<td>1.48±0.35</td>
<td>NS</td>
</tr>
<tr>
<td>VO2 peak/BW [ml/min/kg]</td>
<td>18.33±13.82</td>
<td>25.81±5.34</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>VO2 peak/FFM [ml/min/kg]</td>
<td>32.01±6.35</td>
<td>34.70±7.13</td>
<td>NS</td>
</tr>
<tr>
<td>VE [ml/min]</td>
<td>53.21±11.41</td>
<td>49.39±9.95</td>
<td>NS</td>
</tr>
<tr>
<td>Work [W]</td>
<td>132.7±15.1</td>
<td>119.7±17.8</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Work/BW [W/kg]</td>
<td>1.46±0.21</td>
<td>2.09±0.24</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Work/FFM [W/kg]</td>
<td>2.54±0.30</td>
<td>2.82±0.31</td>
<td>p&lt;0.01</td>
</tr>
<tr>
<td>Time [s]</td>
<td>15.2±1.8</td>
<td>13.7±2.4</td>
<td>p&lt;0.01</td>
</tr>
</tbody>
</table>

Conclusion: Exercise capacity in obese women are similar to lean one and depends on the level of training.
TRANSGENIC EXPRESSION OF HUMAN C-REACTIVE PROTEIN SUPPRESSES ADIPONECTIN SECRETION AND INDUCES INSULIN RESISTANCE IN THE SPONTANEOUSLY HYPERTENSIVE RATS

M. Maxova1, I. Markova1, L. Kazdova1, M. Praveneck2

1Institute for Clinical and Experimental Medicine, Prague, Czech Republic.
2Institute of Physiology, Academy of Sciences, Prague, Czech Republic

Objective: Elevated levels of serum CRP have been reported in patients with diabetes and insulin resistance, but possible involvement of CRP in the pathophysiology of insulin resistance remains to be elucidated. In the current study, we analyzed the effects of increased expression of human CRP in adipose tissue on age-related change in glucose tolerance, adiponectin levels, and insulin resistance of peripheral tissues in transgenic spontaneously hypertensive rats (SHR), a well-established animal model of genetic hypertension, dyslipidemia, and insulin resistance.

Methods: One year old male SHR expressing the human CRP gene (SHR Tg) under control of the fat-specific aP2 promoter were used. Control group comprised age-matched genetically identical rats with absence of the transgene (SHR). Tissue sensitivity to insulin action was measured in vitro without or with insulin (250 μU/ml) according to basal and insulin-stimulated 4C-U-glucose incorporation into muscle glycogen or adipose tissue lipids. Adiponectin was determined by EIA kit (B-Bridge Inc, USA).

Results: There were no significant differences in body weight, weight of epididymal fat pads, serum NEFA, fasting blood glucose levels or adipose tissue insulin sensitivity between rats with and without the CRP transgene. The transgenic expression of CRP was associated with a significant increase in serum triglycerides (0.8±0.05 vs 0.6±0.037 mmol/l, p<0.05), serum insulin levels after glucose load, liver triglyceride accumulation (4.3±0.56 vs 6.89±0.56 mmol/g, p<0.05) and markedly decrease in insulin stimulated glycogenesis in muscle (174±8 vs 278±35 nmol/g/2h, p<0.05). The SHR Tg had markedly decreased levels of serum adiponectin (2.37±0.31 vs 4.32 ± 0.59 μg/ml, p<0.05).

Conclusions: It can be concluded that fat-specific overexpression of human CRP promotes skeletal muscle insulin resistance, liver triglyceride accumulation and decreased serum adiponectin levels in the one year old SHR rats. Results provide evidence that elevated serum CRP levels may be potential contributors to the development of insulin resistance.

Supported by grant NR/9387-3 from IGA MH CR

ADIPOSE TISSUE IS REQUIRED FOR INSULIN SENSITIZING EFFECTS OF ACE-INHIBITION: STUDIES ON MICE WITH DIET-INDUCED OBESITY AND FATLESS A-ZIP/F-1 MICE

P. Kavalková1, M. Bártlova1, M. Haluzík1, Z. Lacinová1, M. Haluzíková1, M. Haluzík1

1Dept. of Medicine, Charles University, Prague; 2Dept. of Sports Medicine, 1 Faculty of Medicine, Charles University, Prague and 3Dept. of Chemistry, University of Ostrava, Ostrava, Czech Republic

Objective: We tested the hypothesis that adipose tissue is required for metabolic effects of ACE (angiotensin converting enzyme) inhibition. To this end, we studied the metabolic effects of ACE inhibitor ramipril in lipoatrophic A-ZIP/F-1 mice which completely lacks white adipose tissue and in C57BL/6J mice with high fat diet (HFD) - induced obesity and insulin resistance.

Methods: The mice were treated with ramipril (8 mg/kg in the food) and fed standard or high fat diet for three months. Blood glucose, serum insulin, leptin, adiponectin and resistin levels were measured by commercial RIA, ELISA and LUMINEX kits and mRNA expression of selected genes was measured in gonadal and subcutaneous adipose tissue by RT PCR. Biochemical parameters were measured by standard laboratory methods.

Results: 3-months treatment with ramipril did not significantly affect blood glucose, serum insulin, triglycerides or free fatty acids in A-ZIP mice. In contrast, in HFD-fed mice, ramipril treatment partially prevented the increase of body fat content, decreased adipocyte size, free fatty acids and triglyceride levels and improved insulin sensitivity as measured by insulin concentrations and HOMA index. In subcutaneous fat, ramipril treatment prevented a decrease of adiponectin mRNA expression induced by HFD and tended to decrease the mRNA expression of macrophage marker Emr1 and TNF-α mRNA. In gonadal adipose tissue, ramipril prevented a decrease of adiponectin mRNA expression induced by HFD, significantly blunted increased Emr1 and MCP-1 and tended to decrease interleukin-6 and TNF-α mRNA expression.

Conclusions: Our data suggest that ACE inhibition by ramipril partially prevented the development of obesity and insulin resistance in mice fed HFD while it fails to affect metabolic parameters in fatless A-ZIP mice. The mechanism of action of ramipril may lie in the increase of adiponectin production in adipose tissue together with the suppression of fat infiltration by macrophages and the amelioration of development of local inflammation in adipose tissue.

Acknowledgements: Supported by IGA 8302-5 and MZO 000064165
**TWO COMMON POLYMORPHISMS WITHIN THE ADIPOnectin GENE ARE ASSOCIATED WITH FOOD PREFERENCES IN EXTREMELY OBESE CZECH INDIVIDUALS**

J.A. Bienertová-Vašků¹, M. Forejt, J. Tomandl, P. Bienert¹, A. Vašků¹

¹Dept of Pathological Physiology, Masaryk University, Brno, Czech Republic; ²Dept of Preventive Medicine, Masaryk University, Brno, Czech Republic; ³Dept of Biochemistry, Masaryk University, Brno, Czech Republic

**Objective:** Considering the pivotal role of adiponectin in white adipose tissue metabolism and signaling, we assessed whether the 45T/G and 94T/G polymorphisms within the adiponectin gene influence the food preferences along with basic anthropometric characteristics in the Czech extremely obese population.

**Methods:** The total of 44 extremely obese subjects were enrolled in the study (BMI 46.03 ± 5.63; % of body fat 50.33 ± 5.13). Basic anthropometrical characteristics associated to obesity were measured and the food intake was monitored using 7-day record method. The polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) method was used to establish the distribution of allele and genotype frequencies of the 45T/G (exon 2) and 94T/G (exon 2) polymorphisms. ELISA was used to determine plasma levels of leptin and leptin receptor.

**Results:** Both polymorphisms studied were significantly associated with various body size measurements including weight, waist and hip circumference, percentage of body fat and body mass index. Furthermore, the 45T/G was linked to the plasma levels of leptin receptor ($\beta = -0.36$, $p = 0.002$). A strong effect of 94T/G on the food preferences of the morbidly obese individuals was observed, the 94T/G GG genotypes being significantly associated with the increased protein and carbohydrates intake ($\beta = -3.2$, $p = 0.02$, $\beta = -5.5$, $p = 0.002$, respectively).

**Conclusions:** The obtained data well fit into a framework for food intake regulation and could provide possible targets for further nutrigenomical research and intervention focused on the food preferences.

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**THE ROLE OF ADIPOCYTES INFLAMMATION IN THE INDUCTION OF HEPATOCYTE INSULIN RESISTANCE**

A. Kohl, N. Bashan, A. Rudich
Dept of Clinical Biochemistry, Ben Gurion University, Beer Sheva, Israel

**Objective:** Adipose tissue communicates with various organs by means of secreted products like fatty acids, adipokines and cytokines. In obesity, inflammation in adipose tissue was demonstrated, thus, the aim of this study was to examine whether factors releasing from adipocytes after exposure to inflammation may impair insulin signaling in hepatocytes.

**Methods:** 3T3-L1 adipocytes were exposed to TNF$\alpha$, in the absence and presence of Rosiglitazone (insulin sensitizer) after which medium was collected and transferred to FAO hepatoma cells. After exposure to the medium in the absence and presence of IL-1 receptor antagonist, the hepatocytes were treated with insulin and the phosphorylation of key proteins in the insulin signaling cascade were measured.

**Results:** The secretion media of 3T3-L1 adipocytes after exposure to TNF$\alpha$ impaired insulin induced phosphorylation of Protein Kinase B (PKB) and Glycogen Synthase Kinase 3 (GSK3). However, exposure of the adipocytes to Rosiglitazone in the presence of TNF$\alpha$ prevented the reduction in PKB phosphorylation. The role of IL-1 in the induction of hepatocytes insulin resistance was study by the addition of IL-1 receptor antagonist to the hepatocytes before exposure to the secreted medium. In those conditions, the impairment of insulin stimulated PKB phosphorylation was totally prevented.

**Conclusions:** We conclude that factors release from adipocytes after exposure to the inflammatory molecule TNF$\alpha$ impair insulin signaling in hepatocytes. This inhibition could partly be attenuated by rosiglitazone. Which are the secreted factors is currently unknown but it seems that secreted IL1 may play a major role in the induction of hepatocytes insulin resistance.
Objective: Obesity and diabetes are major factors contributing to impaired insulin-stimulated glucose transport in adipocytes by downregulation of GLUT4. GLUT4 is the main insulin-responsive glucose transporter located primarily in adipocytes and adipocytes. Its expression is reduced in adipocytes of obese and type 2 diabetic people. The aim of the study was to investigate the relation of GLUT4 expression in visceral and subcutaneous adipose tissue with indices of insulin sensitivity and state of adiposity.

Methods: Paired samples of subcutaneous (SCAT) and visceral (VAT) adipose tissue were obtained from 58 Caucasian women (age 21 to 66 yrs, BMI 19.6 to 48.5 kg/m²). GLUT4 mRNA was analysed by quantitative real time PCR. The entire group of subjects consisted of 26 non obese and 32 obese subjects. The obese group was further stratified according to the presence (n = 16) or absence (n = 16) of the metabolic syndrome (MS). Insulin sensitivity was assessed by the euglycemic hyperinsulinemic clamp.

Results: GLUT4 mRNA levels were lower (p<0.01) in VAT compared to SCAT fat in the whole group, in the three subgroups the difference remained significant for obese without MS only. No differences were found in GLUT4 mRNA in the two fat depots between subgroups of non obese subjects, obese subjects without and with MS. GLUT4 mRNA from both adipose tissue depots correlated negatively with BMI. In entire group of subjects we found correlation of SCAT GLUT4 mRNA with indices of insulin sensitivity and state of adiposity.

Conclusions: GLUT4 is expressed significantly higher in subcutaneous than in visceral fat independently of the state of adiposity and/or presence of metabolic syndrome. We found correlations between GLUT4 mRNA in the subcutaneous adipose tissue depot and indices of adiposity and insulin sensitivity. The results suggest that, in humans, visceral adipose tissue is not being concerned in GLUT4 mediated glucose metabolism and that GLUT4 expression in subcutaneous and not visceral adipose tissue is related to the status of insulin sensitivity.

Study was supported by a grant from The Ministry of Health of the CR IGA NR 91613-200

PPARγ: GENE POLYMORPHISM DOES NOT AFFECT THE LONG-TERM WEIGHT LOSS MAINTENANCE IN OBESE WOMEN

B. Aldhooon1, H. Zamrazilová, B. Bendlović, V. Hainer2

1Department of Cardiology, Institute for Clinical and Experimental Medicine, Prague; 2Obesity Unit, Institute of Endocrinology, Prague, Czech Republic

Objective: We examined the affect of PPARγ Pro12Ala variants on body weight loss and maintenance as well as on energy and nutrient intake, and on selected obesity-related hormones and psycho-behavioral indexes.

Methods: 255 obese women (age 49.0, SD 11.9 years) were followed in obesity unit on average for 2.6 years. Body weight, body composition, energy and nutrient intake, attitude toward eating (measured with the Three-Factor Eating Questionnaire). Beck depression score, plasma level of ghrelin, adiponectin, leptin, were analyzed with regard to the PPARγ Pro12Ala gene polymorphism. Ala carriers vs. Ala non carriers were compared.

Results: Ala non-carriers in contrast to Ala-carriers demonstrated significant reduction of body weight, BMI and plasma leptin level at the follow-up visit. However, the differences in changes of these parameters were not significant between the two groups. Both groups demonstrated significant reduction in energy and macronutrient intakes, as well as increase in dietary restraint and decrease in hunger score.

<table>
<thead>
<tr>
<th></th>
<th>Ala-noncarriers n = 195</th>
<th>Ala-carriers n = 60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body weight (kg)</td>
<td>mean change SD p-value</td>
<td>mean change SD p-value</td>
</tr>
<tr>
<td></td>
<td>-1.90 10.05 0.0121</td>
<td>-2.32 8.91 0.1006</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>-0.75 3.73 0.0117</td>
<td>-0.86 3.24 0.0961</td>
</tr>
<tr>
<td>Waist (cm)</td>
<td>-0.70 4.97 0.0169</td>
<td>-2.54 9.32 0.0764</td>
</tr>
<tr>
<td>Hip (cm)</td>
<td>-1.44 7.37 0.0255</td>
<td>-2.83 7.51 0.0207</td>
</tr>
<tr>
<td>Energy intake (kJ/day)</td>
<td>-1256 2542 0.0000</td>
<td>-1532 2375 0.0004</td>
</tr>
<tr>
<td>Proteins (g/day)</td>
<td>-5.6 23.4 0.0024</td>
<td>-9.4 22.4 0.0126</td>
</tr>
<tr>
<td>Carbohydrates (g/day)</td>
<td>-31.4 83.7 0.0000</td>
<td>-45.8 68.8 0.0001</td>
</tr>
<tr>
<td>Fat (g/day)</td>
<td>-12.9 30.3 0.0000</td>
<td>-18.8 29.6 0.0003</td>
</tr>
<tr>
<td>Leptin (µg/l)</td>
<td>-13.39 35.93 0.0096</td>
<td>-14.09 46.81 0.7240</td>
</tr>
<tr>
<td>Ghrelin (ng/l)</td>
<td>-296.8 320.6 0.0000</td>
<td>-301.5 268.5 0.0051</td>
</tr>
<tr>
<td>Adiponectin (µg/l)</td>
<td>-9.503 78.722 0.0002</td>
<td>3.400 5.083 0.0360</td>
</tr>
</tbody>
</table>

Conclusions: There is no clear evidence that the polymorphism Pro12Ala in obese women has any impact on weight loss maintenance over the 2.6 year-period of follow-up.
INFLUENCE OF n-3 LC-PUFA INTAKE DURING PERINATAL PERIOD ON METABOLISM OF SKELETAL MUSCLE WITH REGARD TO GENDER-SPECIFIC DIFFERENCES

D. Medrikova, P. Janovska, M. Rossmeisl, Z. Jilkova, J. Kopecky
Department of Adipose Tissue Biology, Institute of Physiology AS CR, Prague, Czech Republic

Objective: During pregnancy, fatty acids are transported from maternal circulation across the placenta and play an important role in the regulation of many cell functions including regulation of gene expression. Aim of this work was to specify the role of n-3 polyunsaturated fatty acids (PUFA) in the postnatal induction of uncoupling protein 3 (UCP3) in muscle and to reveal acute and lasting effects of n-3 PUFA on UCP3 and other genes involved in energy metabolism.

Methods: Adult C57BL/6N female mice were divided into two groups fed non-purified low fat chow diet from which one was enriched with n-3 PUFA. Mice and their pups remained on experimental diets during pregnancy and lactation. After weaning pups were randomly divided and put on high fat (HF) or remained on chow diet. Milk consumption and lipid profile of milk were assessed. Gene expressions in oxidative and mixed type muscles were assessed using qRT-PCR and plasmatic markers of lipid metabolism were quantified.

Results: Milk consumption was not affected by n-3 LC-PUFA and milk differed in EPA and DHA content. Differences in gene expression of UCP3 and other genes related to energy metabolism in oxidative (soleus) and mixed (gastrocnemius) muscles of the pups were found. Expression of UCP3 in male gastrocnemius muscle was higher in mice fed HF diet, whereas in soleus muscle there were no obvious changes. The situation in females was completely opposite.

Conclusions: Sexual dimorphism in the activation of UCP3 and other genes involved in energy metabolism by high fat diet was discovered. Interaction between muscle type and gender was demonstrated.

ASSESSMENT OF WHOLE-BODY ENERGY EXPENDITURE IN MICE BY INDIRECT CALORIMETRY: METHODOLOGICAL ASPECTS

P. Janovska, V. Kus, Z. Jilkova, E. Matejckova, J. Cerhakova, M. Rossmeisl, J. Kopecky
Department of Adipose Tissue Biology, Institute of Physiology, Academy of Sciences of the Czech Republic, Prague, Czech Republic

Objective: To verify suitability of the system for indirect calorimetry INCA (Somedic, Sweden) for the measurements in laboratory mice with respect to the effects of nutrition, ambient temperature and age on whole body energy expenditure and substrate partitioning.

Methods: Indirect calorimetry measurements were performed using the INCA system in singly caged mice. Oxygen consumption and CO₂ production were measured continuously in each cage while ambient temperature was controlled by PC using a Peltier element. Respiratory quotient (RQ) was calculated by INCA system manufactured by Somedic (Sweden). Mice were maintained at 20 °C, under standard laboratory conditions and fed different diets after weaning as specified below.

Results: Adult C57BL/6J mice fed high (HF) fed (35%, wt/wt) diet showed preferential utilization of lipids (RQ was 0.805 ± 0.01, and 0.877 ± 0.013, in the HF and chow diet fed mice, respectively; n=8). Measurement in singly caged 10- to 12-day-old C57BL/6J mice showed the critical temperature of about 35 °C as the lower border of thermoneutral temperature zone, while this temperature was about 32 °C in litters of age-matched.

Conclusions: The INCA system proved to be a sensitive and reliable tool for characterization of whole body metabolism in mice, including singly caged pups.
EFFECT OF 24-HOUR HYPERTRIGLYCERIDEMIA ON TUMOR NECROSIS FACTOR ALPHA, RESISTIN, LEPTIN AND ADIPONECTIN IN TYPE 2 DIABETES AND HEALTHY SUBJECTS

J. Kopecky jr.¹, E. Krusinova¹, P. Wohl¹, L. Kazdova¹, M. Hill², T. Pelikanova¹

¹Institute for Clinical and Experimental Medicine; ²Institute of Endocrinology; Prague, Czech Republic

Objective: Tumor necrosis factor alpha (TNF) Resistin, Leptin and Adiponectin are cytokines implicated in the pathogenesis of insulin resistance (IR). Its regulation during experimental lipid infusion which is known to cause IR has not been thoroughly investigated so far. The aim of the study was to assess plasma concentrations of selected cytokines during prolonged hypertriglyceridemia in type 2 diabetes and healthy subjects.

Methods: 11 patients with type 2 diabetes (D) and 11 age-matched healthy control subjects (C) underwent 24-hour infusion of lipid emulsion (Intralipid 20%; 3 g of fat/kg/day; HTG). Plasma concentrations of cytokines were measured before (0 min), at 30 min, 240 min and 24 hours of HTG.

Results: Plasma concentrations of TNF were significantly higher in D compared to C (p<0.001). During HTG, plasma levels of TNF showed in D no dynamic changes, whereas in C significant increase at 24 hours of the infusion was detected (p<0.001; ANOVA).

Plasma concentrations of Resistin significantly rose during the HTG (p<0.05; ANOVA) and the difference between the two groups was not statistically significant.

Plasma concentrations of Leptin were significantly higher in D compared to C (p<0.001). During HTG, plasma levels of Leptin showed in D no dynamic changes, but in C significant drop at 24 hours was detected (p<0.005).

Plasma levels of Adiponectin were significantly higher in D, with no change in time during HTG in both groups.

Conclusions: In D, plasma concentrations of TNF and Leptin are increased. In healthy, prolonged lipid infusion is associated with increase of TNF and Resistin and drop in Leptin plasma concentrations. Finding of higher plasma concentrations of Adiponectin in D vs C is surprising. Our results are in accordance with the hypothesis that these cytokines are implicated in lipid induced IR.

(DEVELOPMENT OF RECOMBINANT HUMAN ZINC-ALPHA-2-GLYCOPROTEIN (ZAG) AND ZAG SPECIFIC ANTIBODIES

D. Strouhalová, M. Ševčík, M. Šrámková, H. Reutowá
BioVendor Research and Diagnostic Products, a.s., Modřice, Czech Republic

Objective: Zinc-alpha-2-glycoprotein (ZAG) is a 41kDa soluble glycoprotein belonging to the MHC-I protein family. It is known to be associated with the loss of adipose body stores in cancer cachexia, and has been shown to stimulate lipolysis by adipocytes in vivo and in vitro. ZAG has been classified as an adipokine expressed in both white and brown adipose tissue. In humans, ZAG gene expression and protein were detected in visceral and subcutaneous adipocytes. ZAG appears to be a possible gene for regulation of body weight and age-dependent changes in the genetic control of obesity. Due to its biological activity, ZAG may be a promising therapeutic drug in a treatment of obesity. The aim of our work was to produce and characterize the recombinant protein and the specific antibodies that can be applied in further investigation of ZAG involvement in a body weight regulation.

Methods: Flag-tagged recombinant Human ZAG was produced in HEK 293 cell line and purified using flag column. Correct cleavage of its signal peptide was confirmed by N-terminal amino sequencing. Recombinant ZAG was used to raise polyclonal antibody in sheep and rabbit. High-specific antibodies were obtained by affinity chromatography and characterized by Western-blot. Both recombinant ZAG and the polyclonal antibody were used to develop an ELISA kit.

Results: Biological activity of recombinant ZAG was measured as its ability to stimulate lipolysis in differentiated human SG6 adipocytes. In a Western-blot, specific ZAG antibodies were able to detect a band of the appropriate MW in human serum and spermatic plasma under reducing and non-reducing conditions as well. ELISA kit based on this recombinant protein and specific antibodies was able to detect human ZAG in cell culture supernatants of recombinant human ZAG transfected HEK 293 cells and murine 3T3 adipocytes, primary human adipocytes and in human blood.

Conclusions: We have developed fully functional recombinant human ZAG, specific polyclonal ZAG antibodies and human ZAG ELISA.

(Supported by IGA MZ ČR NR 8991-3)
Objective: The purpose of this study was to evaluate the insulin signaling cascade in adipocytes isolated from subcutaneous adipose tissue of obese women.

Methods: The study was composed of 2 experimental groups of adult women with 32 to 50 years: Lean (L- BMI<18.5 to 24.9 kg/m²), and Obese (O- BMI>30 kg/m²). Fasting blood samples were collected before meal intake, and also at 15, 60, and 90 minutes after a meal provided Measurement of serum hormones levels: insulin, adiponectin and leptin were analyzed using specific commercial kits for radioimmunoassay. The repeated measures were analyzed among groups and over time, excluding the variable body mass index (BMI), n=20. In the day of the experiments 15 ml of fat was collected by liposuction from abdominal subcutaneous adipose tissue. Adipocytes were isolated by collagenase method and stimulated or not with insulin in vitro. Analysis of expression and activation of key proteins of insulin signaling (IR, IRS-1, PI3K, Akt, pAkt, mTOR e pmTOR) were performed by Western Blotting. Nutrients intake was controlled in 55% carbohydrates, 15% protein and 30% lipids.

Results: Insulin levels of O group (140.4 ± 80.3) were higher (p=0.01) than L (67.1 ± 27.4) and over time (p<0.0001). Adiponectin plasma levels of O group (36.1 ± 20.0) were lower than L (46.7 ± 15.6) and were not found statistical difference over time (p=0.88). Obese women also showed higher levels of plasma leptin. Adipocytes of O group presents lower activation of IRS-1, PI3-K and Akt when compared to L group, demonstrating resistance to the action of insulin.

Conclusions: Ours results shows that obesity in women can induce alterations in glucose and hormonal homeostasis and activation of key insulin signaling proteins in subcutaneous adipose tissue, which can predispose to insulin resistance.

Effect of acute hyperinsulinaemia and angiotensin receptor blockade on leptin and TNF-α in diabetes

E. Krušínová1, K. Zídková1, J. Kopecký jr.1, P. Mlejnek2, P. Wohl1, L. Kazdová1, M. Pravenec2, T. Pelíkánová1

1Diabetes Centre, Institute for Clinical and Experimental Medicine, Prague, Czech Republic; 2 Institute of Physiology, Academy of Sciences of the Czech Republic, Prague, Czech Republic

Objective: Angiotensin II receptor blockade (ARB) is supposed to dispose of insulin-sensitizing properties. The effect of ARB on leptin and tumor necrosis factor α (TNF) is not fully understood. We aimed to assess plasma concentrations of leptin and TNF and their expressions in subcutaneous adipose tissue (SAT) in response to acute hyperinsulinaemia and acute ARB in subjects with type 2 diabetes (D) and healthy controls (C).

Methods: Plasma concentrations of leptin and TNF were measured: 1) at 0, 30 and 240 min of hyperinsulinaemic (1 mU.kg⁻¹.min⁻¹) euglycaemic (5 mmol.l⁻¹) clamp (HEC), and 2) during HEC after acute ARB (losartan 200 mg) (AT-HEC) using the same protocol, in 11D and 12 age-matched C. Needle biopsy of abdominal SAT was performed at 0, 30 and 240 min of both clamps to assess the relative expressions of leptin and TNF using the real-time PCR method.

Results: Metabolic clearance rate of glucose was significantly higher in C compared to D (p<0.001), without any changes during AT-HEC in both groups. Plasma concentrations of leptin were comparable between D and C. During both clamps leptin increased in C (p<0.001). During HEC, different leptin time profiles were detected in C (increase) compared to D (decline) (p<0.01); this difference was abolished during AT-HEC. Expression of leptin in SAT was higher in D compared to C (p<0.001), without any changes during both clamps in both groups. TNF plasma concentrations and SAT expressions were higher in D compared to C (p<0.001). While plasma TNF did not change during HEC or AT-HEC in both groups, its expression increased during HEC but remained stable during AT-HEC (p<0.05) in both groups.

Conclusions: Differential regulation of circulating leptin in D can not be explained by its expression in SAT, which implies the involvement of other fat depots as a source of circulating leptin. TNF is associated with insulin resistance and type 2 diabetes as it is documented by its increased plasma concentrations and expressions in SAT. Hyperinsulinaemia stimulates the expression of TNF, while ARB ameliorates this effect. Changes in TNF expression may be involved in the improvement of insulin sensitivity connected with ARB treatment.

(Supported by grant IGA MH CZ NR 8821-3)
ADIPOCYTE LIPID-BINDING PROTEIN IN SUBCUTANEOUS ADIPOSE TISSUE IN SUBJECTS WITH DIFFERENT CATEGORIES OF GLUCOSE INTOLERANCE

E. Krušínová1, K. Zidková1, J. Kopecký jr.1, P. Mlienek2, P. Wohl1, M. Pravenec1, T. Pelikánová1

1Diabetes Centre, Institute for Clinical and Experimental Medicine, Prague, Czech Republic; 2Institute of Physiology, Academy of Sciences of the Czech Republic.

Objective: Adipocyte lipid-binding protein (ALBP) has been shown to regulate lipid metabolism and to affect thereby insulin sensitivity. However, its regulation in human obesity has not been cleared up to now. Our aims were to measure the expressions of ALBP in subcutaneous adipose tissue in subjects with different categories of glucose intolerance and to analyze possible relationships of ALBP with selected metabolic parameters.

Methods: 12 subjects with impaired glucose homeostasis (IGH), 11 patients with type 2 diabetes (D) and 12 age-matched healthy men – controls (C), underwent 4-hour hyperinsulinaemic (1 mU.kg⁻¹.min⁻¹) euglycaemic (5 mmol.l⁻¹) clamp in order to verify their insulin sensitivity. Needle biopsy of abdominal subcutaneous fat was performed before the clamp to assess the ALBP expressions using the real-time PCR method. As a reference gene human cyclophilin was used.

Results: Insulin sensitivity, expressed as metabolic clearance rate of glucose (MCR), was significantly higher in C compared to D and IGH, whereas IGH did not differ from D. MCR (IGH vs. D vs. C: 4.47±0.66 vs. 4.88±0.49 vs. 9.12±1.0 ml.kg⁻¹.min⁻¹; p<0.001; ANOVA). Other anthropometric and metabolic parameters (fasting serum lipids, waist circumference, BMI) were comparable between IGH and D, and lower in C compared to other groups. Relative expressions of ALBP were higher in D compared to IGH and C. They did not significantly differ between IGH and C. ALBP mRNA/cyclophilin mRNA (IGH vs. D vs. C: 1062±114.3 vs. 2024±194.8 vs. 769.4±77.46; p<0.001; ANOVA).

Significant positive correlations were found between ALBP expression and BMI (r= +0.46; p<0.01) or fasting plasma glucose (r= +0.60; p<0.001).

Conclusions: Our results suggest that dysregulation of glucose metabolism at the conversion of prediabetes into type 2 diabetes is associated with increased ALBP expression in subcutaneous adipose tissue, whereas metabolic syndrome with IGH does not show alterations in ALBP expression.

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ADIPOKINE SECRETION IN BIOPSY-DERIVED EXPLANTS OF ADIPOSE TISSUE DURING THE WEIGHT REDUCTION

M. Vítková1, J. Vratolová1, E. Klímčáková2, Z. Kováčová1, J. Polák1, M. Bajzová1, L. Rossmeislová1, L. Hněvkovská3, V. Štich3

1Dept of Sport Medicine, 3rd Faculty of Medicine, UK Prague, 2Dept of Immunoanalysis, Faculty of Medicine in Plzen, UK Prague, 3Franco Czech laboratory of clinical Research on Obesity, INSERM Toulouse and 3rd Faculty of Medicine, Prague.

Objectives: Obesity is associated with a low-grade inflammation and insulin resistance. The aim of this study was to determine whether improvements in insulin sensitivity induced by the weight loss are associated with changes of secretion of inflammatory cytokines in adipose tissue (AT).

Methods: 15 obese pre-menopausal women (BMI 34.5±3.9 kg/m²) participated in this study. The subjects followed a 6 months’ weight reduction program initiated by a 4 weeks’ 800 kcal/d very-low-caloric-diet (VLCD) and completed by a 3 months’ weight maintenance phase (WM). Samples of subcutaneous abdominal AT biopsies and plasma were obtained before and after the VLCD and at the end of WM. Concentration of adipokines IL-6, IL-8, TNFα, leptin, MCP-1, PAI-1 and HGF was measured in conditioned media of biopsy-derived explants (after 4 h of incubation) by multiplex immunoassay.

Results: Insulin sensitivity (homeostasis model assessment – HOMA-IR) was improved during VLCD and remained ameliorated after WM (P<0.008). Secretion of IL-6, IL-8, TNFα and MCP-1 were increased after VLCD by 48-56% (P<0.05) and decreased to the pre-diet values after WM. The secretion of these cytokines correlated positively with each other. Leptin secretion fell down after VLCD and WM by 48 and 33%, respectively. Secretion of PAI-1 and HGF remained unchanged during the whole program.

Before the diet, the secretion of IL-8, TNFα and MCP-1 correlated positively (r= 0.56, P<0.05) with HOMA-IR. No correlations for the diet-induced changes of these variables were found.

Conclusion: During the weight reduction program, secretion of cytokines from adipose tissue is differentially regulated by the severe calorie restriction compared with the weight maintenance phase. The time-course of cytokine secretion is different from that of insulin sensitivity. The results do not indicate a direct association between the evolution of insulin sensitivity and cytokine production in adipose tissue during the diet-induced weight loss.

The work was supported by grants GACR 303/07/0840, IGA NR 9161-3/2007 and by HEPADIP and MOLPAGE projects supported by EU in the FP6.
Objective: Mitochondrial uncoupling contributes to the control of energy expenditure. Human uncoupling protein 2 (UCP2) is mitochondrial protein that is involved in the control of fatty acids' metabolism and may protect against oxidative damage. The aim of the study was to investigate the influence of the promoter polymorphism -866 G/A of the UCP2 on body weight loss, energy and nutrient intake, and on selected obesity-related hormones and psycho-behavioral indexes.

Methods: A allele carriers (A+): 162 women with genotype AA or AG characterized by mean±SEM; age (years): 49±0.98; BMI (kg/m²): 38±0.56; fat (%): 45±0.45; and A allele non-carriers (A−): 91 women with genotype GG characterized by mean±SEM; age (years): 48±1.15; BMI (kg/m²): 36±0.64; fat (%): 43±0.54 were followed up in obesity unit on average for 2.5 years. Anthropometric, nutritional, psychobehavioral (Eating Inventory, Beck Depression Inventory), hormonal (ghrelin, leptin) parameters were compared.

Results: Age, body weight, BMI at baseline examination were not different between groups. At the beginning of treatment A− in contrast to A+ had significantly higher weight gain (kg) from 20 years of age to present: 38.2±1.51 vs. 32.4±2.11, p=0.02; waist circumference (cm): 111±1.22 vs. 106±1.39, p=0.01; and hip circumference (cm): 128±1.13 vs. 123±1.17, p=0.00; and fat (%): 45.3±1.05 vs. 43.6±0.54, p=0.01 and significantly lower level of HDL cholesterol (mmol/l): 1.49±0.03 vs. 1.59±0.04, p=0.04. Both female groups demonstrated significant changes of energy and macronutrient intakes and psychobehavioral indexes at the control examination after 2.5 years. A− compared to A+ had significantly greater decrease in daily fat intake (g): -22.6±4.07 vs. -9.9±2.74, p=0.02; and increase in dietary restraint: 4.16±0.67 vs. 2.41±0.51, p=0.02. However, only A+ exhibited decrease BMI (kg/m²): -0.7±0.28, p=0.02; body weight (cm): -1.78±0.76; hip circumference (cm): -1.80±0.63; and leptin level (µg/l): -18.72±7.33.

Conclusions: These data indicate that carrying A allele might influence body composition, weight change in response to weight reducing programme and nutritional intake.

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Objective: Free fatty acids (FFAs) are natural ligands of the PPARγ receptor. FFA plasma concentration and composition may represent one of the factors accounting for high heterogeneity of conclusions concerning the effect of the Pro12Ala on BMI, insulin sensitivity or diabetes type 2 (DM2) susceptibility. The objective was to investigate the relation of the PPARγ2 Pro12Ala polymorphism and basal and oGTT stimulated plasma concentration and composition of FFAs and markers of glucose and lipid metabolism as well as body composition and to study the possible modulating effects of the FFAs status on the metabolic outcomes.

Methods: We studied 324 nondiabetic subjects (M/F: 99/225; age=32±11 years; BMI=23.9±4.0 kg/m²) in terms of biochemical parameters related to glucose and lipid metabolism, body composition and Pro12Ala genotyping. A family history (FH) of DM2 in a subgroup of the participants (n=106, M/F 33/73) was positive (FH+). All subjects underwent anthropometric measurement, fasting biochemical examination and also the 3h oGTT. Basal and oGTT-stimulated FFA levels were evaluated using spectrophotometric method and FFA composition was assessed by gas chromatography. Pro12Ala polymorphism was identified by SSCP. For statistical evaluation (Fisher’s exact test, Mann-Whitney test, ANOVA), NCSS 2004 software was used.

Results: 1) FH+ was associated with lower %PUFA (p=0.01) and slightly higher %MUFA (p=0.04). 2) The Pro12Ala carrierson was not associated with fasting plasma FFA concentration or composition, anthropometric or metabolic markers of glucose and lipid metabolism in tested population. 3) However, the interaction of carrierson status with FFA levels influenced the basal glucose levels (p=0.004), disposition index (p=0.018), triglycerides (p=0.045) and HDL-cholesterol (F: p=0.015) and leptin (F: p=0.008) levels. The metabolic effects of 12Ala carrierson were significantly influenced by FFA levels – the “beneficial role” of 12Ala was seen only in the presence of low concentration of plasma FFA.

Conclusions: Our results reflect the importance of the interaction of the PPARγ2 Pro12Ala polymorphism and free fatty acids concentration and composition. It is assumed that also the treatment by insulin-sensitizing thiazolidinediones – synthetic ligands of PPARγ2 - is modified by the Pro12Ala genotype, lipid parameters, diet and probably by physical activity.

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ADDITIVE EFFECTS OF ROSIGLITAZONE AND n-3 POLYUNSATURATED FATTY ACIDS IN THE AMELIORATION OF ADIPOSE TISSUE INFLAMMATION, DYSLIPIDEMIA, AND INSULIN RESISTANCE IN MICE FED HIGH-FAT DIET

O. Kuda1, Z. Jilkova1, P. Janovska1, M. Rossmeisl1, T. Jelenik1, L. Kázdova2, M. Baranowski3, S. Cinti4, M. Bryhn5, J. Kopecky1
1Department of Adipose Tissue Biology, Institute of Physiology of the Academy of Sciences, Prague, Czech Republic; 2Institute of Clinical and Experimental Medicine, Prague, Czech Republic; 3Department of Physiology, Medical University of Bialystok, Poland; 4Institute of Normal Human Morphology, University of Ancona, Italy; 5Silentia AS, Svelvik, Norway

Objective: We tested a hypothesis that a combination treatment by EPA/DHA and rosiglitazone would provide beneficial additive effects in the reduction of obesity, low-grade adipose tissue inflammation, insulin resistance, and associated disorders in mice fed HF diet.

Methods: Adult male C57BL/6J mice were fed for up to 20 weeks either corn oil-based HF diet or HF diet containing (i) 15% of its lipids replaced by EPA/DHA concentrate (14% EPA, 46% DHA; EPAX 1050 TG, EPAX AS, Norway); (ii) rosiglitazone (10 mg/kg diet); and (iii) EPA/DHA and rosiglitazone at doses as above (EPA/DHA-rosiglitazone).

Results: Weight gain and and obesity-associated disorders were ameliorated, in an additive manner, by EPA/DHA and rosiglitazone. The systemic effects of the treatment correlated with the significant reduction of low-grade inflammation of adipose tissue, namely accumulation of macrophages in crown-like structures embracing non-viable adipocytes, which was nearly abolished by EPA/DHA-rosiglitazone. Additive impact of the combination treatment in the prevention of hypertrophy of adipocytes was also found. Beneficial additive effects on plasma lipids, muscle ceramide level, glucose tolerance and plasma levels of adiponectin were observed.

Conclusions: A combined use of n-3 PUFA and thiazolidinediones generated additive effects in the treatment of obesity-associated disorders. The combination treatment may be used in diabetic patients to reduce dose requirements and hence the incidence of adverse side-effects of the thiazolidinedione therapy.

EFFECT OF HYPERINSULINEMIA ON ADIPOKINE LEVELS IN SUBCUTANEOUS ADIPOSE TISSUE IN SITU

M. Vítková1,3, J. Vrzalová2, E. Klimčáková2,3, M. Kováčková2,3, Z. Kováčová2,3, J. Polák2,3, M. Bajzová2,3, L. Rossmeislová, Z. Hněvkovská2,3, V. Štich1,3
1Dept of Sport Medicine, 3rd Faculty of Medicine, UK Prague, 2Dept of Immunoanalysis, Faculty of Medicine in Pilsen, UK Prague, 3Franco Czech laboratory of clinical Research on Obesity, INSERM Toulouse and 3rd Faculty of Medicine, Prague

Objectives: Adipose tissue (AT) is known to be an endocrine organ, which releases a large spectrum of substances including cytokines and chemokines. In obese and diabetic subjects the production of cytokines may be altered causing low grade pro-inflammatory state. In this study we focused on the effect of hyperinsulinenia on the cytokine levels in subcutaneous adipose tissue measured by microdialysis.

Methods: 13 obese pre-menopausal women (BMI 34.5±5.0 kg/m²) participated in this study. Concentration of cytokines was measured in dialysate provided by microdialysis with 100 kDa cut-off catheter and in plasma during 3 hours’ euglycemic-hyperinsulinemic clamp and in control conditions (infusion of Ringer solution). IL-6, IL-1β, IL-8, IL-10, MCP-1, TNFα, and PAI-1, were analyzed in plasma and dialysate using multiplex immunoassay at Luminex100.

Results: During the clamp, the interstitial and circulating levels of IL-1β, PAI-1 and TNFα remained unchanged when compared to baseline levels and to control experiment. Hyperinsulinemia induced an increase of IL-8 and IL-6 in dialysate (P=0.028) and in plasma, the latter increase not being significant. For MCP-1 both the circulating and interstitial concentrations were rising. Moreover, the relative changes of IL-6 levels in dialysate during the clamp correlated with IL-8 and MCP-1 changes (p=0.043, r=0.529; p=0.021, r=0.589) and the hyperinsulinemia-induced changes in plasma correlated with changes in adipose tissue. Conclusion: Acute hyperinsulinemia induced a rise of IL-6, IL-8 and MCP-1 in interstitium of adipose tissue. The induced changes of cytokine levels in AT were related to the changes in plasma suggesting the release of these substances from AT into circulation.

The work was supported by grant GACR 303/07/0840 and by HEPADIP and MOLPAGE projects supported by EU in the FP6.
ASSESSMENT OF NUTRITIONAL KNOWLEDGE AND ANTHROPOMETRIC STATUS OF ADOLESCENTS IN EAST TEHRAN, 2006

F. Esfarjani, Z. Kamrani, R. Roustae, M. Hadjifaraji
National Nutrition & Food Technology Research Institute, Faculty of Nutrition Sciences and Food technology, Shaheed Beheshti University of Medical Sciences

Introduction: Adolescence is a unique opportunity to promote nutritional knowledge in order to improve future generation’s health. This study was conducted to determine nutritional knowledge and anthropometric status of adolescents in East Tehran.

Methods: A descriptive, cross-sectional study was carried out on 780 students, 12-15 years old from 12 guidance schools in East Tehran. Samples were selected using systematical random method in each grade. A questionnaire about demographic characteristics and nutritional knowledge was completed and scores of nutritional knowledge were classified in weak, intermediated and good categories. Weight and height were measured by standard methods. Weight status and stunting were determined based on BMI and height for age induces compared to NCHS/CDC2000, respectively. Data was analyzed using SPSS.

Results: The mean age (years) of them was 13.3±1. The highest level of parents’ education was diploma (34% of mothers and 39% of fathers). Nutritional knowledge of adolescents have revealed that 28.9%, 30.2%, 40.9% of girls and 38.6%, 25.7%, and 35.6% of boys were in weak, intermediated and good categories, respectively. There was a positive correlation between their nutritional knowledge and their father’s education. The data also showed that, 6% of the subjects were underweight (<5th), 12% at risk of overweight (85-95th), 13% overweight (≥95th) and 14.5% stunted (<10th) and relation between anthropometric status and nutritional knowledge wasn’t significant.

Conclusion: The results indicated that adolescents have undesirable status in terms of anthropometric indices and nutritional knowledge. Therefore, nutritional intervention programs are required as one of the main priorities to obtain sustainable development in the country.

Key Words: adolescence, underweight, overweight, stunting, nutritional knowledge.

STUDY OF THE EFFECT OF SESAME OIL ON BLOOD GLUCOSE AND LIPID PROFILE OF TYPE 2 DIABETIC PATIENTS REFERRING TO THE YAZD DIABETESE RESEARCH CENTER OF IRAN

S. Egtesadi1, M. Mosallaie-Poor Yazdi2, F. Kasebi2, M. Afkhami-Ardakani2
1Department of Human Nutrition, Iran University of Medical Sciences, Tehran, Iran. 2Department of Nutrition &Biochemistry, Yazd University of Medical Sciences, Yazd, Iran.

Objectives: This study was designed to explore the effect of sesame oil on blood glucose and lipid profile of type 2 diabetic patients at Yazd Diabetese Research Center.

Methods: A quasi-experimental study, following approval by Iran University of Medical Sciences’ Ethics Committee for Human Studies, was conducted on 25 patients with type 2 diabetes mellitus (age: 51.50±6.28y, BMI: 27.30±3.00Kg/m2, disease duration: 7.08±5.03y, Fasting blood glucose level: 181.00±51.90 mg/dl). Subjects received 30g/day sesame oil, in place of other cooking oils, for 42 days. Plasma glucose, glycated hemoglobin (HbA1c), lipid profile [Total cholesterol (TC), Low-density lipoprotein cholesterol (LDL-C), High-density lipoprotein cholesterol (HDL-C) and Triglycerides (TG)] were measured at baseline and after 42 days of sesame oil substitution. 24 hours recalls were obtained at the first, middle and end of study. Data were analyzed using analysis of variance with repeated measure and paired t-test.

Results: Following 42 days intake of sesame oil, there were significant decreases in FBS (181.00±51.93 vs 154.00±39.65 mg/dl), HbA1c (9.64±2.00 vs 8.40±1.74 percent), TC (226.68±31.40 vs 199.80±37.87 mg/dl), LDL-C (123.90±34.56 vs 95.53±32.54 mg/dl) compared to pre-treatment values (P<0.05). Blood TG level decreased after intake of sesame oil but this difference was not significant. Also the changes of HDL-C levels were not meaningful.

Conclusions: Sesame oil resulted in considerable decrease in blood sugar. HbA1c and blood lipids (TC and LDL-C) in type2 diabetics.
Objective: The aim of the study was to verify the connection between binge eating, alexithymia and body image in obese patients attending the ambulatory slimming cure.

Methods: The analyses were performed using BES (Binge Eating Scale), TAS-26 (Toronto Alexithymia Scale) and Figure Rating Scale by Stunkard. The experimental population (n=65 obese women; age 46.58±13.4 yrs, BMI=37.84±5.84 kg/m²) was divided into two subgroups: according to intensity of binge eating BES≤17; BES>17 pts and according to alexithymia TAS<74 and TAS≥74 pts.

Results: Most of the patients (n=51; 78.5%) found the ideal figure the same as attractive for the others. According to the BES-subdivision women with BES>17 have chosen the figure attractive for the others statistically slimmer than the women with BES≤17 pts. The difference between the actual figure and the attractive for the others was statistically larger in patients with BES>17pts.

In TAS-subdivision no statistical differences were found.

Conclusions: The figure attractive for the others is slimmer in women with more intensive binge eating. The presence of alexithymia in obese women has no influence on body image.

Objective: The aim of our study was to examine the relationship between overweight, age, divergence among "real Self" and "ideal Self" and disorders associated with eating behaviours in overweight women.

Methods: Fifty obese women (BMI 35.7±5.8 kg/m², mean age 49.4±8.8 yrs ) were enrolled into this study. Patients were provided with: The Figure Rating Scale (Stunkard, Sørenson, & Schulsinger, 1983) and The Eating Disorder Inventory (Garner, Olmsted & Polivy, 1983).

Results: Correlations were observed between: drive for thinness and unconsciousness of stimuli coming from the body (R=0.345; p<0.05), drive for thinness and maturity fears (R=0.337; p<0.05); unconsciousness of stimuli coming from the body and maturity fears (R=0.293; p<0.05); number of attempts to losing weight and drive for thinness (R =0.325, p<0.05).

Women with BMI>35 kg/m² had higher intense of maturity fears, then women with BMI <35 kg/m² (Z=-1.979; p<0.05). In women with divergence among "real Self" and "ideal Self" ≤2 had lower intense of interpersonal distrust (Z=-2.270; p<0.05) and higher intense of maturity fears (Z=-2.181; p<0.05) then women with divergence grater than 2. The patients with divergence among "real Self" and "ideal Self" equal 6 figures, characterized with higher intense of bulimic disorders (Z=-2.121; p<0.05), in comparison to women in which the divergence was ≤2 figures.

Women younger then <45 yrs. had higher intense of bulimic disorders (Z=2.009; p<0.05) in comparison to older women (>45 yrs.) The patients who gained weight before 20 yrs of age had higher body dissatisfaction (Z=1.969; p<0.05) in comparison to women who gained weight after 40 yrs of age. Women with multiple attempts of weight loss had stronger drive for thinness (Z=-2.147; p<0.05) and lower sense of inefficacy (Z=1.971; p<0.05) then women with only one attempt of weight loss.

Conclusions: There is positive relationship between disorders associated with eating behaviours and body weight, body image, age, the onset of overweight, the number of weight loss attempts.
MOOD AND ANXIETY SYMPTOMS AND PERSONAL LIFE GOALS AMONG OBESE WOMEN: A CROSS-CULTURAL STUDY

A. Brytek-Matera¹, E. Spitz², M. Bak-Sosnowska³, P. Kocelak⁴, B. Zahorska-Markiewicz⁴

¹Institute of Psychology, University of Silesia, Katowice, Poland; ²Laboratory of Health Psychology, University Paul Verlaine, Metz, France; ³Department of Psychology, Medical University of Silesia, Katowice, Poland; ⁴Department of Patophysiology, Medical University of Silesia, Katowice, Poland

Objective: The aim of this study was to evaluate the relationship between mood and anxiety symptoms and personal life goals in Polish and French obese population. The study posed the question whether or not there are differences within scores of our variables between groups of obese patients of the different nationality and between clinical group and healthy group.

Methods: We examined a group of 30 Polish and 32 French obese women. Our control group consisted of 60 healthy adult women (30 Polish and 30 French). In our study, we used the Hospital Anxiety and Depression Scale by Zigmond and Snaith and the Goals Importance and Facilitation Scale by Maes et al.

Results: The Polish clinical group reported significantly more anxiety (p<0.01) and depression symptoms (p<0.01) than French women. Additionally, they showed significantly higher goals concerning intellectual (p<0.001), social (p<0.001) and personal development (p<0.05). Those goals were very important for Polish women but, at the same time, very difficult to attain. Obese Polish subjects concentrated more on life goals concerning intellectual (p<0.05) and social development (p<0.05) in comparison to normal-weight women. Moreover, goals concerning intellectual (p<0.001), personal (p<0.005) and social (p<0.001) development were more important and, at a time, more difficult to achieve than for normal-weight control.

No significant differences were found between obese and healthy French groups.

In a sample of the Polish obese population, anxiety symptoms correlated significantly with the goals concerning intellectual development (r = 0.47; p<0.01), social development (r = 0.40; p<0.05) and avoidance of unpleasantness (r = 0.40; p<0.05). No correlations were found between mood and anxiety symptoms and personal life goals in obese French.

Conclusions: The results revealed significant differences between obese Polish and French women in measures of depression, anxiety and personal life goals.

NUTRITION VALUE AND GLYCEMIC INDEX OF BREAD WITH ADDITION OF DRIED MUSHROOMS

J. Regula¹, D. Walkowiak-Tomczak²

¹University of Life Sciences in Poznań, Poland ²Department of Human Nutrition and Hygiene; ³Institute of Food Technology of Plant Origin

Objective: The recommended introduction of products with added shiitake and oyster mushrooms to the diet of obese and diabetes people as a source of macro and micro elements requires determination of contents of these. The purpose of this study was the estimation a chemical composition of products with the addition of dried mushrooms and assessment of glycemic index of this product.

Methods: The experimental material consisted of breads with a 10% and 20% addition of dried shiitake and oyster. Contents of protein, fat and ash were determined using standard analytical methods. Soluble and insoluble dietary fiber were assayed using Asp’s enzymatic method. Contents of minerals were analyzed by atomic absorption spectrophotometry. Glycemic index of products was conducted by comparing the curves of the increase of glucose level in blood after consuming the products and pure glucose.

Results: It was found that the products were characterized by high contents of fiber, Fe, Cu, Mg and K, and low contents of Na and Ca. The very low glycemic index was notified for bread with the addition of 20% mushrooms.

Conclusions: The results of the study suggest that the products with addition of dried shiitake and oyster mushrooms can be advised in diet of obese and diabetes people.

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Changes in Antioxidant Activity of Plums during Drying

D. Walkowiak-Tomczak1, J. Regula2
University of Life Science in Poznan, 1Institute of Food Technology of Plant Origin; 2Department of Human Nutrition and Hygiene

Objective: The aim of the study was to determine changes in antioxidant activity of plums subjected to drying. Plums are raw material rich in phenolic compounds and they exhibit high antioxidant activity. The consumption of plums, especially in the form of prunes, has an advantageous effect on several functions of the organism, such as e.g. improved blood lipid profile, lipid and glucose metabolism or regulation of bowel movements.

Methods: In the analyses plums (Prunus domestica) of cv. Verity came from experimental orchards of University of Life Science in Poznan. Four drying methods were applied: drying at a constant temperature of 60°C or at an increasing temperature of 40, 60 and 80°C, and osmotic drying in a 70% sucrose solution for 12 h or 24 h and forced drying at 60°C. Antioxidant activity was determined colorimetrically using a cation radical of 2,2'-azino-bis(3-ethylbenzthiazoline-6-sulphonic acid) (ABTS).

Results: As a result of drying antioxidant activity of plums increased. In fruit dried at a constant temperature of 60°C antioxidant activity was 131 µmol Trolox/g d.m., while in those dried at an increasing temperature it was 118 µmol Trolox/g d.m. In plums dried osmotically and forced dried at 60°C this activity was 107 and 97 µmol Trolox/g d.m., respectively, in samples dehydrated for 12 h and 24 h.

Conclusion: Drying plums yielded a product with higher antioxidant activity in relation to fresh fruits, probably due to the formation of Maillard reaction products. The lower antioxidant activity in plums dried osmotically was connected with the release of some biologically active substances, to the sucrose solution during osmotic dehydration.

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The Effect of Socioeconomic Level on Nutritional Status and Obesity in Boys in Ankara, Turkey

N. Yabancı
Dep of Food and Nutrition Education in Vocational Educational Faculty in Gazi University, Ankara, Turkey

Objective: Obesity increased in recent years at different rates among socioeconomic levels (SEL). The purpose of this study was to analyze the effect of SEL on nutritional status and obesity in boys in Ankara, Turkey.

Methods: The study population comprised 11-13 years old 186 boys attending two public elementary schools in Ankara, Turkey. School A and school B, located in low and high SEL areas respectively. We assessed dietary intake, physical activity and anthropometric measurements including weight, height, mid-upper arm, waist, hip circumferences, triceps, biceps, subscapular, suprailliac skinfold thickness.

Results: Prevalences of overweight (≥85.-<95. percentiles) and obesity (≥95. percentile) were 7.6 and 1.1% for low SEL; 11.7 and 6.4 for high SEL, respectively. Weight, height, BMI, mid-upper arm circumference, triceps, biceps, subscapular and suprailliac skinfold thickness, waist, hip circumference and percentage of fat mass were significantly higher in high SEL than in low SEL (p<0.05). Boys in low SEL were physically more active than boys in high SEL. Vegetable, fruit and legume consumptions were higher in low SEL, while junk food, sugar and carbonated beverage consumptions were higher in high SEL. Moreover, percentage of energy from fats was higher in high SEL than in low SEL.

Conclusions: SEL affects nutritional status and physical activity, thus obesity is very a common problem in high SEL. To invest in the future of public health, it would be important to increase the awareness for healthy nutrition. It would be required to monitor obesity, encourage physical activity and develop school nutrition programs according to SEL.
LEPTIN SIGNALING PATHWAY IN THE HYPOTHALAMUS-PITUITARY-THYROID AXIS FROM YOUNG AND OLD RATS AFTER POSTNATAL EARLY OVERNUTRITION (EO)

P.C. Lisboa1, I.H. Trevenzoli1, E. Oliveira1, A.L. Rodrigues1, M.C.F. Passos2, E.G. Moura1

1Biology Institute; 2Nutrition Institute, State University of Rio de Janeiro, Brazil

Objective: Postnatal EO is a risk factor for obesity in adult life. Rats raised in small litter can develop hyperinsulinaemia, hyperphagia, hyperleptinaemia and hypertension when adults. As leptin regulates the thyroid function and thyroid hormones metabolism, our aim was to study the leptin signaling pathway in the hypothalamic-pituitary-thyroid axis of the postnatal EO model.

Methods: To induce EO, litter size was reduced to 3 pups/litter (SL group) on the 3rd day of life. In controls (NL group), litter size was adjusted to 10 pups/litter. Rats were killed at 21 and 180 days-old. Proteins of leptin signaling pathway were analyzed by Western Blotting and serum leptin, T3 and T4 by radioimmunoassay.

Results: SL group body weight was higher since the 7th day (+33%, p<0.05) until 180 days-old (+18%, p<0.05). The fat mass was higher in SL group at 21 days (visceral: +238%, total: +172%) and at 180 days (visceral: +38%, total, total: +52% p<0.05). Leptin and TSH was higher only at 21 days (+88%, 60%, p<0.05 respectively). SL animals showed higher serum T3 and T4 by radioimmunoassay. Hypothalamic SOCS3 content of SL group was higher at 180 days-old (+32%, p<0.05) respectively. SL animals showed higher serum T3 and T4 at 21 days-old (+89%, +68%, p<0.05 respectively), while the opposite was observed at 180 days-old (+11%, -70%, p<0.05 respectively). Hypothalamic SOCS3 content of SL group was higher at 180 days (+32%, p<0.05) until 180 days-old (+18%, p<0.05). The fat mass was higher in SL group at 21 days (visceral: +238%, total: +172%) and at 180 days (visceral: +38%, total, total: +52% p<0.05). Leptin and TSH was higher only at 21 days (+88%, 60%, p<0.05 respectively). SL animals showed higher serum T3 and T4 at 21 days-old (+89%, +68%, p<0.05 respectively), while the opposite was observed at 180 days-old (+11%, -70%, p<0.05 respectively). Hypothalamic SOCS3 content of SL group was higher at 180 days (+32%, p<0.05). Pituitary Ob-Rb, JAK2 and p-STAT3 of SL group were higher at 21 days (+134%, +55%, +110% p<0.05 respectively). At 180 days, pituitary JAK2 and STAT3 were lower (-52%, -20% p<0.05 respectively). Thyroid Ob-Rb and STAT3 content of SL group were lower at 21 days-old (-62%, -46%, p<0.05 respectively). At 180 days-old, thyroid Ob-Rb and JAK2 content were higher in SL group (+40%, +60%, p<0.05 respectively).

Conclusions: Postnatal EO induces short and long-term effect upon leptin signaling pathway in the rat hypothalamic-pituitary-thyroid axis which could regulate the hormonal secretion of this axis in this programming model. We suggest that thyroid status can regulate the leptin signaling pathway at pituitary and thyroid level.

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SOY AND CANOLA OIL EFFECTS ON LIPID PROFILE AND BONE MASS OF YOUNG RATS


Institute of Biology (IBRAG). University of Rio de Janeiro State, Rio de Janeiro, Brasil

Objective: Obesity is becoming highly prevalent in children, but its relationship with high fat diets and consequences on bone metabolism is controversial. The ratio of n-6/n-3 polyunsaturated fatty acid (PUFA) in the diet is related to increase bone strength. Soy oil has a higher n-6/n-3 ratio (6.75), while canola oil has a lower ratio (1.90). As soy oil is more consumed (82%) than canola oil (4%) in Brazil, the impact of this nutritional behavior over bone metabolism and lipid profile may be relevant for Public Policies.

Methods: Male Wistar rats received a control diet (7g soy oil, C=11) or a high fat diet (19g soy or canola oil, 19%S, n=12 and 19%C, n=12), from weaning until they were 60 days-old. At the sacrifice, blood, femur, lumbar vertebra (LV) and mandible were collected. Triglycerides, cholesterol, HDL-c, calcium and phosphorus serum concentrations were determined.

Results: Food intake did not differ, but, body weight gain was higher in 19%S (14.5%) and 19%C (11.5%) groups. High fat fed groups showed lower triglycerides (38%), higher HDL-c (35%), and higher mass of femur (25%), LV (11%) and mandible in 19%C (10.5%). The distance between greater and lesser trochanter was lower (7%) in 19%S, and the medial point diameter of the diaphysis was higher (9%) in the 19%C. LV1-LV6 length was 5% higher on high fat groups. Computerized tomography analysis showed higher BMC on femur diaphysis (19%S-14% and 19%C-17%), proximal epiphysis (19%C-20%) and LV (19%S-17% and 19%C-28%).

Conclusions: After weaning, high fat diet, containing soy or canola oil, increases body weight without hyperphagia and provided a healthy lipid profile. Despite both oils presented beneficial effects over bone mass, canola oil seems to be more efficient than soy oil in the increase of the bone parameters analyzed.
Objective: The purpose of this presentation is to analyse the connection between the body fat per cent and the nutritional status at birth in childhood and adolescence, between 7 and 18 years of age.

Methods: A nation-wide Longitudinal Growth Study of Hungary started with four cohorts of newborns in 1980, 1981, 1982 and 1983. The survey comprise of the sample represented on the level of 2% of the Hungarian children who was born between 1980–1983 and who were measured regularly until they reached the age of 18. In the study only those children were taken into consideration whose birth weight was between 2500–4500 g and those who did not suffer from diseases which may influence the growth and development of the children. Body fat was assessed by four skinfold measurements. For the classification of the nutritional status at birth we used the percentile method worked out by Battaglia & Lubchenco in 1967. Their scheme defines the condition and nutrition of the infant by taking the 10th and 90th percentiles of the body mass at birth by gestational age as limit values. Accordingly, an infant is small for gestational age (SGA) if under the 10th percentile (undernourished), appropriate for gestational age (AGA) if between the 10th and the 90th percentiles and large for gestational age (LGA) if over the 90th percentile (overfed).

Results: The body fat per cents were higher in the girls than in the boys and the differences were significant in all age-groups. The highest body per cent was found in the girls at the age of 15.5 year (27.2 %) while in the boys at the age of 12.5 year (15.5 %). Significant differences were also found in the body fat per cent of the sample according to the nutritional status at birth. The highest values of the mean body fat per cent were found both in the girls and boys in the LGA groups (girls: 25.1 %, boys: 15.0 %), while the lowest values of the mean body fat per cent were found in the SGA groups (girls: 24.0 %, boys: 12.7 %).

Conclusions: The neonatal development (the nutritional status at birth) affect significantly the body fat per cent of the children and adolescents.
Objective: More and more school-age children are becoming overweight or obese. Obesity is consequence of an energy imbalance. Many of children are not meeting dietary recommendations. Food habits are characterized by an irregular meal pattern, skip breakfast, also school lunch, increases in soft-drink consumption, and are not eating fruits and vegetables..., simultaneously become less active and watch tv or computer each day.

Methods: The aim of this study was undertaken to define the prevalence of being overweight or obese, dietary habits, food intake and physical activity in a population of children 8–14 years of age, living in Hradec Kralove Czech Republic. The target population was elementary school children in 2nd, 4th, 6th and 8th grade. The prevalence of overweight and obese was assessed using the 1991 Czech references values. Children completed 24-hour recall and of food frequency questionnaire. Dietary intakes were analyzed using nutrient analysis software NUTRIDAN.

Results: On the basic of measurement of 738 school children were 22 % obese and 17% overweight children.

Conclusions: During the last decades school children have been getting heavier. Our findings identified important trends in the dietary intakes and physical activity of school children. Regular intake of fruits and vegetables significantly influence satiety and energy intake which in turn may directly affect BMI of children. Despite obvious benefit of fruits and vegetable, children in HK-schools do not consume adequate amounts of them on a regular basis.
Objective: The aim of this was to compare energy and macro-nutrients intakes in university hostel students in two countries of Asia.

Methods: Female students from the hostels of International Islamic University, Malaysia, Kuantan Campus and NWFP, Agricultural University Peshawar- Pakistan were assessed for the energy and macro-nutrients intakes. A total of 140 students were registered who volunteered to participate in this study. The age range of the registered students was 22-26 years. On the day of the registration, age, height and weight were recorded; also, food frequency questionnaires (FFQs) were provided. The participants were asked to record alternately for three days whatever they ate during the prescribed week. Out of 140 students 139 returned the FFQs and one of the students failed to return therefore excluded from the study. From the anthropometry, the BMI was used to assess the under, ideal, over-weight and obese students. From the FFQs, energy and nutrient intakes were calculated using the food composition Tables for Malaysia & Pakistan and compared with the recommended nutrients intakes (RNIs).

Results: The body weight for the required height among the Malaysian students was lower by 7.81 percent than the reference value whereas the body weight of Pakistani students matched to the reference weight for height (Table 1). The Malaysian students were 28.0, 61.0, 5.5 and 0.9 % under, ideal, over-weight and obese respectively whereas Pakistani students were 100 % in the category of ideal-body weight. The total energy consumption was higher among Malaysian students by 9.93 % compared to the reference requirements whereas the Pakistani students claimed to meet the requirements. In terms of nutrients balancing the Malaysian students were having the ideal combination of the macro-nutrients and it was within the recommended range of 55-60, 15-20 and 25-30 % for carbohydrates, protein and fat respectively. These were poor among the Pakistani students and meet the energy requirements at the expense of fat consumption.

Conclusions: This study suggests that there is imbalance in macro-nutrients intake among the students.
MATERNAL FLAXSEED DIET DURING LACTATION PROGRAMMES GLUCOSE HOMEOSTASIS AND LEPTIN LEVELS IN YOUNG AND ADULT RATS OFFSPRING

M.S. Figueiredo1, E. Oliveira¹, I.H. Trevenzoli¹, A.A. Troina¹, G.T. Boaventura², P.C. Lisboa¹, E.G. Moura¹, M.C.F. Passos3

¹Biology Institute, State University of Rio de Janeiro, Brazil; ²Nutrition and Dietetic Dept, Fluminense Federal University, RJ, Brazil; ³Nutrition Institute, State University of Rio de Janeiro, RJ, Brazil

Objective: Some studies have shown the correlation between nutritional, hormonal or environmental events in early life and the development of adult chronic diseases (programming). So, we evaluated whether mothers flaxseed diet, exclusive source of fibers and essential oils, during lactation influences the endocrine and metabolic parameters in adult life of the rat offspring.

Methods: Virgin rats (200-220g) were mated and after birth were divided into two experimental groups: control (C), with free access to a casein diet containing 17% protein, 52% carbohydrate, 7% lipid and 5% fiber and flaxseed group (F), with free access to a diet containing 17% protein from casein (12%) and flaxseed (5%), 54% carbohydrate, 10% lipid exclusive from flaxseed and 5% fiber exclusive from flaxseed. After weaning, we evaluated the body weight (BW) gain and the food intake of the offspring until the 180 days-old. Visceral fat mass (VFM) and carcasses were collected to evaluate the body fat content. Serum hormone concentrations (leptin and insulin) were evaluated by radioimmunoassay. It was also determined glycaemia. One-way ANOVA and the Student’s t-test were used for to analyze all experimental observations.

Results: After weaning, F group did not show changes in BW and food intake. F rats presented lower VFM on the 21 days old (-17.8%, p<0.05) and 180 days old (-16.3%, p<0.05), but no changes were observed in body protein mass in both ages. Serum glucose no changes at 21 days old, but was lower at 180 days old on the F rats (-6%, p<0.05). Serum insulin of F group were lower (-39%, p<0.05) at 21 days old and higher (+24%, p<0.05) at 180 days old. So the F group had lower HOMA index (-29.6%, p<0.05) at 21 days old and a higher HOMA index (+28.5%, p<0.05) at 180 days old. The flaxseed group presented higher (+69.4%, p<0.05) serum leptin at 21 days old, but no changes were observed in adults animals.

Conclusions: These findings show that the maternal exposure to a flaxseed diet during lactation leads for an early hypoinsulinaemia and hyperleptinaemia and programs the insulin resistance in adults’ offspring. We suggest that one lignans SDG (diglicosídeo secoisolariciresinol) of the flaxseed compounds can be responsible for the later insulin resistance.

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CYANIDINE 3-GLUCOSIDE EXERTS INSULIN-LIKE EFFECTS IN MURINE AND HUMAN ADIPOCYTES

B. Scازzocchio, R. Vari, M. D’Archivio, F. Galvano, E. Soricelli, G. Silecchia, R. Masella

1National Centre for Food Quality and Risk Assessment, Istituto Superiore di Sanità, Rome, Italy. 2 Dept. Biological Chemistry, University of Catania, Italy; 3Dept. Surgery, University “La Sapienza” of Rome, Italy

Objectives: Cyanidine-3-glucoside (C3G), an anthocyanin largely distributed in human diet, has been demonstrated to counteract the development of obesity and insulin resistance in mice likely by modulating adipocytes, which play a pivotal role in the regulation of the normal total body fuel metabolism. Specifically, a reduced response of adipocytes to insulin stimulation is a central event in the establishment of insulin resistance. This study was aimed to evaluate the effects of C3G on glucose homeostasis and insulin sensitivity. Therefore, the uptake of glucose and the expression of adiponectin were determined in 3T3-L1 murine adipocytes and in primary human adipocytes, after treatment with different concentrations of C3G.

Methods: At confluence 3T3-L1 preadipocytes were induced to differentiate by hormonal mixture. The cells were used for the experiments on day 14, when more than 90% of cells showed the adipocyte phenotype. Human adipocytes were isolated from omental adipose tissue biopsies from patients undergoing surgery for benign conditions. Glucose uptake was determined by evaluating cellular incorporation of 2-deoxy-D-[3H] glucose (2-DG) in control and (50µM) C3G-treated cells, pre-incubated with 100nM insulin for 15 min. Furthermore, we evaluated the effects of C3G (10-50µM) on glucose uptake in adipocytes without insulin stimulation. In addition, total RNA, extracted by TRIZOL, was used to evaluate GLUT4 and adiponectin expressions by RT-PCR.

Results: C3G treatment induced a significant increase of insulin sensitivity both in murine and human adipocytes as shown by the increase in glucose uptake (up to 50%) observed in C3G-treated cells. Worth of note, C3G exerted an insulin-mimetic action which was demonstrated by the increase in glucose uptake observed in cells in the absence of insulin. This activity appeared inversely correlated with C3G concentration and was accompanied by an up-regulation of adiponectin and GLUT4 gene expressions.

Conclusions: Our findings provide a novel insight into the therapeutic implications of anthocyanin which can also have important implications for preventing obesity and diabetes.

PROTOPATECHUI ACID INDUCES THE EXPRESSION OF GLUTATHIONE-RELATED ENZYME BY ACTIVATING NRF2 PATHWAY

R. Varı, B. Scazzocchio, M. D’ Archivio, C. Santangelo, C. Filesı, R. Di Benedetto, C. Giovannini, R. Masella

National Center for Food Quality and Risk Assessment, Istituto Superiore di Sanità, Rome, Italy

Objectives: Extra virgin olive oil (EVOO) biophenols appear to exert beneficial effects in preventing oxidative stress-associated diseases likely because of their anti-oxidant/anti-inflammatory properties. Specifically, we have demonstrated that EVOO biophenols can strengthen the endogenous antioxidant defences by up-regulating the expression of the enzymes glutathione peroxidase (GPx) and glutathione reductase (GR). Aim of this study was to investigate the molecular mechanisms underlying such activation by treating the murine macrophage-like cell line J774A.1 with protocatechuic acid (PCA), an hydroxybenzoic acid contained in EVOO and recognized as one of the main metabolites formed during the absorption of complex biophenols. In particular we evaluated the activation of the transcription factor Nrf2, involved in regulating the expression of phase II detoxifying and antioxidant enzyme.

Methods: Cells were cultured in DMEM supplemented with 10% foetal calf serum. At confluence the cells were incubated with 0.25 mM PCA for various times (30’, 1h, 2h, 6h and 12h). Total RNA, extracted by the TRIZOL isolation method, was used for qRT-PCR analysis to evaluate Nrf2 expression. Protein levels of Nrf2 in the nucleus and GPx and GR in whole cell lysate were assessed by Western blot. The involvement of Nrf2 in the upregulation of gene expression was confirmed by the siRNA technique.

Results: Time-course treatment of J774 A.1 with PCA resulted in a transient up-regulation of Nrf2 mRNA level detected at 30’ (+30% with respect to the untreated control cells) which rapidly returned to the basal level. The nuclear Nrf2 level increased in time, reaching its maximum expression at 2h (+62% with respect to the untreated control cells). Worth of note the increase of Nrf2 level occurred prior to the significant increase of GPx and GR protein expression, which reached the maximum at 6h (+50% and 63%, respectively, with respect to the untreated control cells). Anti-Nrf2 siRNA transfected cells treated with PCA showed a remarkable reduction of Nrf2 nuclear level at 2h (-70%) with respect to the untransfected PCA-treated cells. Worth of note we found a significant decrease of GPx and GR protein expression at 6h (-45%,-60%), likely as a consequence of Nrf2 knockdown.

Conclusions: Our results suggest that the up-regulation of GPx and GR induced by PCA was determined by Nrf2 activation. PCA, that seems to be an important metabolic modulator, could be useful to counteract cell function alterations induced by oxidative stress. In vivo studies are needed to better understand these effects.
RELATIONSHIP BETWEEN OBESITY AND FOOD HABITS IN URBAN THAI SCHOOL CHILDREN

K. Shafaghi1, A.M.A. Naini2, J.Y. Aree3

1Department of Nutrition and Dietetics, Faculty of Medicine and Health Sciences, Putra University (UPM), Malaysia; 2Tehran University of Medical Sciences, Iran; 3Institute of Nutrition, Mahidol University, Thailand

Objective: The main objective of this study was to determine the prevalence of obesity among urban Thai school children and its relationship to the food habits.

Methods: This case control study was conducted among 85 urban primary school children attending one school in Central Thailand. It explored food habit patterns and activity levels of obese urban Thai school children. The study used a combined quantitative and qualitative approach. Obesity was defined as percentile ≥95th of the sex-specific BMI-for-age growth chart, CDC.

Results: Oil consumption was higher among the obese group than the control. There was no statistically significant relationship between sugar and oil consumption in the two groups. Obese children had more snacks before breakfast as well as during lunch and dinner. There was a statistically significant relationship between eating snack in the two groups. Obese children knew about food groups and could classify foods better than normal children. Children learn about obesity from their parents, relatives, doctors, teachers, hospitals, and advertisements. Most of obese children (86.1%) knew they were obese, and were not happy with their status, because they thought that obesity led to inactivity and health problems.

Conclusions: High fat intake would supposedly be associated with obese children. Oil consumption of obese children is higher than that of the control group. Increased intake in fat may be coming from snacks rather than from family meals. Obese children preferred oily, sweet, salty, and sour foods. Families of obese children, consume more home-prepared foods, and the preference was for oily foods which could contribute to obesity in children. The results indicate that oil consumption among the control group was less than the obese group, while sugar consumption was equal in both groups. School policies need on the control of junk foods and on creating a supportive nutrition environment that provides children with the skills and opportunities to adopt healthy eating behaviors. Parents and guardians, teachers and television should be the major targets for nutrition education programs.

EFFECT OF THE FRUCTOSE FEEDING ON EXPERIMENTAL CANCEROGENESIS IN RATS

P. Gateva, M. Katrafilova, N. Boyadjieva

Pharmacology Department, Medical University Sofia, Bulgaria

Objective: It could be that metabolic syndrome is influencing cancerogenesis in some cases. Fructose feeding is well known experimental model of metabolic syndrome in rats. Our aim was to evaluate the effect of fructose feeding in rats treated or not with cancerogene and androgen.

Methods: Forth groups of male Wistar rats (totally 80) were treated as follows, starting at age of 6 weeks. Group C – controls. Group F received 10% Fructose solution instead of tap water. Group A received 60-day treatment with testosterone and cancerogen N-methyl-N-nitrosourea. Group Z+A received treatment as those in group A and additionally received 10% Fructose instead of tap water.

Results: One year after the start of our study we obtained 0 tumors in C group, 0 tumors in F group, 10 tumors in A group and 3 tumors in group Z+A (p<0.05). Tumors were mainly sarcoma 2-5 cm.

Conclusions: Our results indicate that fructose feeding in rats could be protective in our model of cancerogenesis with N-methyl-N-nitrosourea and testosterone.
The Balkan diet (Balkan antioxidative food) in the prevention and treatment of metabolic syndrome

S. Handjiev
National Multiprofile Transport Hospital "Tzar Boris III" - Sofia, Bulgaria

Our recent studies show that the traditional Balkan cooking from the end of the 19th and the first half of the 20th century is much similar to the Mediterranean diet. Furthermore, the nutritional habits in all of the Balkan countries are stressing on an exclusive closeness. This fact is giving the right to define the Balkan healthy food or the Balkan diet. The traditional nutrition in the Balkan countries is responding to many of the major aspects of healthy food. From the nutritional prevention point of view, the results, related to the risks of developing a disease and their connection to the dietetic models, seem to be promising. The healthy effects of the integral dietetic models are of extremely importance in the nutritional prevention. The statement that the traditional Balkan nutrition from the past century has many beneficial effects regarding many diseases, incl. metabolic syndrome and the coronary heart disease, is gaining more and more supporters.

The traditional Balkan nutrition is rich on antioxidants. The Balkan healthy food contains the highly active antioxidants resveratrole and pycnogenol. The diet is rich on alpha-tocopherol, ascorbic acid, beta-carotene, selenium, bioflavonoids, and many other biologically-active substances. Besides the Bulgarian yoghurt and the typical kinds of cheese, here belong the traditional vegetables—a rich source of various flavonoids and carotenoids.

The specific character of the culinary treatment preserves the biological activity of the contents.

The so called Balkan healthy Food (resp. Balkan diet) has the positive properties and all of the elements of the healthy nutrition.

Long-term effects of developmental treatment with LC-PUFAs on brain phospholipids and cognitive behaviour

A. Kacsándi1, E. Hőgyes2, D.É. Köbor-Nyakas1,3, R. Frenkl1, P.G.M. Luiten2, C. Nyakas1

1Semmelweis University, Faculty of Physical Education and Sport Sciences, Budapest, Hungary; 2Biological Research Center, Hungarian Academy of Sciences, Szeged, Hungary; 3Molecular Neurobiology, Groningen University, The Netherlands.

Objective: Long-chain polyunsaturated fatty acids (LC-PUFAs) composition of neural membranes is a key factor for brain development and function including cognition. The n-3 LC-PUFAs’ deficiency in the nutrients of human offspring varies geographically according to the availability of sea-food.

Methods: In rat studies supplementation and moderate deficiency of LC-PUFAs were maintained during fetal development and early postnatal age and their impact on fatty acid composition of different phospholipids and on behavioural development and cognition ability up to old age were followed. Fatty acids in four different phospholipid fractions obtained from brain tissue membrane homogenates were assayed by gas chromatography. Four ages were compared: 12th postnatal day, puberty, adult (12-month) and old (28-month) ages. Spontaneous behaviour measuring novelty-induced exploration and spatial learning in Morris water maze were tested in the early postnatal age, and in the adult and 28 months old ages, respectively.

Results: As a result of LC-PUFA supplementation the content of n-3 docosahexaenoic acid (DHA) increased in most of the phospholipid fractions starting from the age of 12 days up to the one year old adult age. Regarding the n-6 fatty acids the amount of the long-chain components decreased in the same age-dependent manner. By the old age no difference in the fatty acid composition of nervous tissue membranes could be found any more between groups. Contrary to the chemical characteristics behavioural effect could be found even in the 28 months old age. The LC-PUFA supplementation improved spatial learning, while the moderate LC-PUFA deficiency acted into the opposite direction in cognition and decreased rearing activity as well.

Conclusion: Either the supplementation or the deficiency of LC-PUFAs during development exerted a long-term effect on fatty acid composition of nervous tissue membrane phospholipids up to adult age, but the functional consequences on cognition lasted even longer up to the old age of 28 months.

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Objective: Dietary supplements with fish or plant oil are frequently used as a support in the treatment of a number of diseases, including critical stages (enteral and parenteral nutrition). Their supporting effect, provided by polyunsaturated fatty acids (PUFA) n-3 and n-6 family, depends on the content of these acids in individual formulas. Exogenous PUFA have antiatherogenic and antithrombotic effect, resulting from their complex action on plasma lipoproteins, fluidity of membranes, function of membrane enzymes and receptors, modulation of the eicosanoid production, regulation of blood pressure and metabolism of minerals. Saturated fatty acids (SFA) have an opposite effect. Knowledge of the FA composition is important for the choice of appropriate formula.

Methods: Tested formulas were purchased in pharmacies and shops with health nutrition in Prague. Fatty acids were transferred to methyl esters and analyzed by capillary gas chromatography. Results are expressed in molar %. 

Results: Precursor of PUFA n-6 is linoleic acid (LA), which is also the most buoyant one. Important metabolic products are γ-linolenic and arachidonic acids. Seeds of most plants are the source of PUFA n-6. Content of LA in formulas with evening primrose oil varied between 60 and 75%, content of oleic acid (OA) between 6 and 13%, and those of palmitic acid (PA) between 6 and 8%. Formulas with soya lecithin contained 54-60% LA, 16-19% PA and 7-18% OA. Linoleic acid dominated also in oils of amaranth, borage, saw palmetto, cucurbit, milk thistle, black cumin and wheat germ (41-56%). Content of OA in these formulas was 14-29%, that of PA 9-20%. Precursor of PUFA n-3 is α-linolenic acid (ALA), most important metabolic products being eicosapentaenoic (EPA) and docosahexaenoic (DHA) acids. Seeds and leaves of some plants are sources of ALA, nevertheless, its conversion to EPA and DHA is much more effective in sea animals than in humans. Content of EPA and DHA in formulas prepared from natural fish oil was 2-23% and 2-14%, respectively. Content of SFA varied between 14 and 34%. Two formulas were prepared in the form of ethyl esters of FA and thus were enriched by EPA (36 and 64%) and DHA (24 and 21%), respectively.

Conclusions: Composition of FA in dietary supplements is very heterogeneous and strongly dependent on the source of oil.

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EFFECT OF n-3 POLYUNSATURATED FATTY ACIDS ON ADIPONECTIN LEVEL IN MODERATELY OBESE WOMEN

Objective: Polysaturated fatty acid of fish origin may influence the outcome of weight management regimens. The effect of eicosapentaenoic (EPA) and docosahexaenoic (DHA) acids can be related to the change of peptides regulating food intake and to changes in gene expression of lipogenic or lipolytic enzymes in adipose tissue.

Methods: 24 moderately obese women (BMI 35.6±3.6 kg/m²) underwent 3 months of weight management. Subjects were randomized into 2 groups. Polysaturated fatty acid concentrate of fish origin (FO) 9 g/day was added to diet in group 1. In group 2 placebo was added (PL, canola oil) in the same dose. Body composition, fatty acid composition of serum and adipose lipids, level of peptides regulating food intake and mRNA levels of enzymes from subcutaneous adipose tissue were measured.

Results: The average weight loss was not significantly different in both groups. Only borderline significant higher fat loss (p<0.10) in FO group in comparison with PL was found. Levels of EPA, DHA and total n-3 fatty acids were significantly increased in serum lipids in FO group. Significant positive correlations of adiponectin change with initial DHA (r=0.437, p<0.05), with initial sum n-3 fatty acids in serum phospholipids (r=0.442, p<0.05) and with initial sum n-3 fatty acids in serum triglycerides (r=0.448, p<0.05) were found in the whole group. We also found significant negative correlation of change sum n-3 fatty acids in phospholipids with change in plasma adiponectin (r=-0.643, p<0.05) and with initial sum n-3 fatty acids in phospholipids (r=-0.671, p<0.05) only in group with added polyunsaturated fatty acids (FO group).

Conclusion: The results suggest higher intake of n-3 fatty acids in diet may influence adiponectin level predominantly in subjects with initial low concentration of n-3 fatty acids in serum phospholipids.

Study was supported by grant NR/7782-4 IGA Ministry of Health.CR and by Pronova Biocare, Norway.
HORMONAL PARAMETERS ASSOCIATED WITH FOOD INTAKE IN ANOREXIA NERVOSA PATIENTS AND THEIR CHANGES DURING SHORT-TERM REFEEDING

D. Sedláčková1, L. Beranová1, J. Kopečková1, H. Papežová2, J. Nedvídková1

1Institute of Endocrinology, Prague, Czech Republic; 2Department of Psychiatry, First Faculty of Medicine, Prague, Czech Republic

Objective: Anorexia nervosa (AN) is characterized by markedly changes in hormone secretion influencing food intake, energy homeostasis and long-term body weight regulation. The aim of this study was to determine selected hormonal parameters and their changes after six weeks of nutritional-rehabilitation program and psychotherapy in hardly malnourished anorexia nervosa patients.

Methods: Nine women with DSM-IV diagnosed anorexia nervosa (BMI 14.74 ± 0.43; age 23.3 ± 1.0) and ten age-matched healthy women (BMI 21.45 ± 0.72; age 24.3 ± 0.8) were enrolled to the study. Fasting plasma levels of ghrelin, leptin, adiponectin, NPY, IGF-I and IGFBP-III were measured before and after the treatment.

Results: Fasting plasma ghrelin and NPY levels were significantly increased in AN patients comparing to healthy women, while plasma leptin, adiponectin, IGF-I and IGFBP-III were decreased. After six weeks of the treatment plasma ghrelin levels significantly decreased, plasma leptin, IGF-I and IGFBP-III levels increased during the treatment. Plasma NPY and adiponectin levels didn’t change, average BMI significantly increased during the treatment in AN patients.

Conclusions: We found that most of these hormones and metabolic parameters express actual nutritional status of a body and were changed during the short-term refeeding in AN patients.

The study was supported by IGA grant NR/9158-3

FOOD AS ONE OF FACTORS INFLUENCING DAYTIME MELATONIN LEVELS

B. Rácz, K. Vondra, M. Dušková, K. Šimůnková, M. Hill, L. Stárka

Institute of Endocrinology, Prague

Objective: Melatonin has a key role in circadian timing system. For the best understanding the possible role of melatonin like a factor, which can influence food intake, we monitored levels of melatonin, orexin, ghrelin, C-peptide and glycemia during daytime.

Methods: Five women (mean age 31.6 ± 2.8 years, mean BMI 23.2 ± 2.3 kg/m²) in follicular phase of menstrual cycle were examined. The levels of hormons we followed during 16 hours. the subjects had standardized food in standardized time and day regime. Period and subject were assessed by Person’s correlations and using multiple stepwise backward regression model consisting of the time factor as a polynomial, and serum C-peptide and glucose. The study was approved by local ethical committe.

Results: We found positive correlation between melatonin and ghrelin (r=0.453, p<0.003). A significant negative correlation between melatonin and C-peptide was found (r=0-0.5525, p<0.0001, n=50). A borderline significant realtionship between melatonin and blood glucose was detected (r=-0.4679, p<0.0006, n=50). Ghrelin negatively correlated with C-peptide (r=-0.356, p<0.02). Our results showed no significant correlation between orexin levels and other measured variables.

Conclusions: The negative relationship between melatonin and C-peptide as well as rapid changes of melatonin levels permits subject for investigation about food as one of factors influencing daytime melatonin levels.

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THE EFFECT OF A HIGH FAT DIET ON THE FATTY ACID PROFILE AND SYNTHESIS OF PHOSPHOLIPIDS DEPENDS ON MUSCLE FIBRE TYPE

A. Janovská1, G. Hatzinikolas1, M. Mano1, J. McInerney2, G. Wittert1

1Discipline of Medicine, University of Adelaide, Adelaide, South Australia; 2CSIRO Human Nutrition, Adelaide, South Australia

Objective: To determine the effect of a HFD on the content and fatty acid (FA) composition of phospholipids (PLs) and the expression of genes involved in FA synthesis with regard to muscle fibre type.

Methods: Oxidative soleus (SOL) and glycolytic extensor digitorum longus (EDL) muscles were isolated from Wistar rats fed either with a standard or with a high saturated and monounsaturated fat diet (HFD). Lipids were extracted from both muscles. PL fractions were separated by TLC plate and analyzed by GC. Gene expression of SCD1, SCD2, ∆5 desaturases, Elovl6 and Elovl5 were measured by RT-PCR.

Results: The changes in the PL profile reflected the composition of the diets in a fibre type specific manner. SOL muscles displayed a higher lipid content than EDL muscles with a particular increase in stearic, oleic and linoleic acid (P≤0.01) relative to palmitic and DHA acid (P<0.01) which in turn were higher in EDL than in SOL muscles. The contrast was amplified by the HFD. Thus in response to the HFD, the levels of monounsaturated FAs (MUFA; P<0.05) increased only in SOL muscles. Saturated FAs (SFAs; P≤0.01) and n-6 polyunsaturated FAs (PUFAs; P<0.05) increased, whereas n-3 PUFAs decreased (P<0.01) in both muscles, with a greater effect in SOL muscles. The changes were accompanied by a significantly lower n-3/n-6 PUFA ratio. Levels of long-chain PUFAs and unsaturation of PLs (P<0.01) due to a lower n-3 PUFA synthesis (P<0.01) in the SOL muscles. The expression of SCD1 was approx 11 times higher in EDL than in SOL muscles (P=0.000). Neither SCD1 nor SCD2 expression changed with the HFD. There were no basal differences in the expression of ∆5 de in SOL muscles but, in response to the HFD, expression of ∆5 desaturase decreased (P=0.052) in EDL muscles only. Expressions of Elovl5 and Elovl6 were higher and lower (P≤0.05) respectively, in EDL than in SOL muscles. Expression of Elovl6 was decreased after the HFD (P<0.05) in EDL muscles.

Conclusions: In response to the HFD, EDL muscles preferentially synthesize n-3 PUFAs whereas in SOL muscles, an increase in SFAs is accompanied by a decrease in n-3 PUFAs and an increase in MUFAs and n-6 PUFAs. This is mediated by a differential expression of desaturases and elongases in oxidative and glycolytic muscles and confirms the importance of fibre type distribution.

PROTEIN PASTA – A SAFE AND QUALITY FOOD FOR OVERWEIGHT REDUCTION

K. Kyhos1, J. Ouhrabková2, S. Vavreinová1, J. Strohalm1, Š. Svačiná2, M. Matoulek2

1Food Research Institute Prague; 23rd Internal Medicine Clinic, 1st Faculty of Medicine, Charles University, Prague, Czech Republic

Objective: Low-calorie protein material based on thermally coagulated egg white has been recently developed at the Food Research Institute Prague. The resulting material containing porous fiber can be shaped into slices or further used in other products, such as spreads. The proposed protein spreads and slices represent low-calorie products that can be served together with bread, pastry, potato, rice, etc. However, the aim of our further research was to develop low-calorie side dishes based on egg white, as the side dish commonly forms the major part of the meal. Pasta is a favored component of the diet; research was therefore targeted on the development of such a side dish. In order to improve its nutritional properties, its fortification with n-3 unsaturated fatty acids, soluble and insoluble dietary fiber and folic acid was tested. The novelty product developed, low-calorie protein noodles, are suitable for use as a side dish or as a standalone meal.

Methods: Protein noodles consist of dried egg white, soluble and insoluble fiber, polysaccharides, mineral supplements and water. These raw materials are subjected to a mechanical process resulting in a semi-liquid mixture of precisely defined viscosity, which is subsequently forced through a profiled nozzle on water surface tempered to 95°C. This ensures that proteins become denatured and the noodles keep their shape. After cooling down the noodles are packed into a plastic bag/foil. The product is also suitable for gluten-free diet. It is stored at 4°C; its minimum microbial stability is 12 weeks.

Results: The nutritional value of the protein noodles (g/100 g of product) was determined as follows: dry matter, 15.9; proteins, 9.3; saccharides, 3.1; total dietary fiber, 2.8 (soluble fiber, 1.8; insoluble fiber, 1.0); fat, 0.3; ash, 0.4; energy value, 221 kJ (52 kcal). The product is low-calorie, with low content of fat and saccharides, does not contain gliadin and is also applicable in diets of patients with diabetes and coeliac disease. At 4°C its shelf life exceeds 12 weeks. A quantity of 8,500 g of the pasta was prepared in the laboratory together with broccoli and then subjected to sensory evaluation by the participants of a workshop organized by the society “Stop to obesity” – STOB. Conclusion: Due to its nutritional composition and technological properties, egg white is a suitable raw material for the development of nutritionally defined foods for both clinical tests and the low-calorie products intended for the general public. The new product (protein noodles) might find its use in communal catering, fast foods, or as a constituent of convenience dishes, and thus contribute to the reduction of overweight in the general population.
AD LIBITUM DIETS VARYING IN PROTEIN CONTENT AND GLYCEMIC INDEX: EFFECTS ON BODY WEIGHT IN THE DIOGENES NON-SHOP CENTER BASED DIETARY INTERVENTION

T.M. Larsen1, S. Dalskov1, M.A. van Baak2, S.A. Jebb3, A. Kafatos4, A. Pfeiffer5, J.A. Martinez6, S. Handjiev7, M. Kunesova8, A. Astrup1, W.H.M. Saris2

1University of Copenhagen (DK); 2Maastricht University (NL); 3MRC HNR Cambridge (UK); 4University of Crete (GR); 5German Institute of Human Nutrition (GER); 6University of Navarra (SP); 7NMTB Sofia (BUL); 8Institute of Endocrinology, Prague (CZ)

Objective: To study the effects of protein content and glycemic index (GI) of the diet on weight loss maintenance during a 6-month “instruction only” dietary intervention in 6 European centres.

Methods: After an 8 week low calorie diet (body weight (BW) loss 11.0 ± 2.9 %), 513 adults (168 men, 345 women; BMI 31.0 ± 4.4 kg/m2, age 41.3 ± 6.5 y) were randomised to 5 ad libitum diets for 6 months: high protein/low GI (HP/LGI), HP/high GI (HP/HGI), LP/LGI, LP/HGI and control diet (official dietary recommendations).

Results: 344 subjects (67%) completed the 6-month intervention. In our preliminary analyses, a univariate analysis with the initial weight loss as a covariate showed no significant difference in weight loss between groups (p=0.2).

Conclusion: In this large European cohort of families with obese adults, dietary intervention with variations in protein and glycemic index did not affect weight change during 6 month.

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THE RELATIONSHIP BETWEEN OBESITY, PREMATURE OVARIAN FAILURE, OSTEOPOROSIS AND DIABETES MELLITUS - CLINICAL STUDY

E. Circo, S.Circo

“Ovidius” University, Department of Endocrinology, Constanta, Romania

Objective: To assess the correlation between premature ovarian failure and the bone mineral density (BMD) in obese women with DM.

Methods: This study was conducted on 71 women with obesity and premature ovarian failure. They were divided in 3 groups: group I - included 15 women previously diagnosed with IDDM (“Insulin Dependent Diabetes Mellitus”); group II – included 23 women previously diagnosed with NIDDM (“Non Insulin Dependent DM”), and the control group including 33 women without DM. The patients included in this study were diagnosed with DM in the last 5 years and obesity in the last 10 years. We calculated BMI (body mass index) and the WHR (waist-to-hip ratio) and measured BMD at the level of lumbar spine and the femoral neck (DXA). The presence of osteoporotic fractures was taken into account as well.

Results: Patients with IDDM showed to have a higher incidence of osteoporosis (20%), compared to patients with NIDDM (4.3%) and nondiabetic obese patients (9.1%). In patients with class I obesity the incidence of osteoporosis was found to be higher (53%), compared to patients with class II obesity (7.7%) and (1%) in patients with class III obesity. 62% of patients with osteoporosis have had peripheral obesity whereas 12% have had abdominal obesity. The incidence of osteoporotic fractures was: 28.5% vertebral fractures, 16.3% Colles’ fractures and 4.3% hip fractures.

Conclusions: The presence of IDDM in women with premature ovarian failure and obesity is associated with a lower BMD compared to patients with NIDDM or those without DM. The higher amount of adipose tissue and abdominal obesity has shown to be protective against the loss of BMD.
SEVERITY OF OBESITY AND CHARACTERISTICS OF BODY FAT DISTRIBUTION CORRELATED TO THE INCIDENCE OF HYPOGONADISM
E. Circo, S. Circo
"Ovidius" University. Endocrinology Department, Constanta, Romania

Objective: Our study tried to correlate hypogonadism to BMI (Body Mass Index) and somatic characteristics of obesity.

Methods: Our study group consisted of 113 young obese patients, 71 females and 42 males. The patients in our study had their body mass index – BMI = weight (kg)/height(m)^2 calculated and analyzed according to WHO classification of overweight persons. The BMI calculation was supplemented with the measurement of waist-to-hip ratio in all the studied patients. In order to assess the gonadal function in our obese patients, we have chosen the following studies: clinical, anthropometrical and hormonal tests.

Results: The percentage of women with menstrual disorders and android obesity (93.5%) was higher than those with menstrual disorders and gynoid obesity (42.5%). The percentage of women with anovulation and android obesity (70.9%) was higher than those with anovulation and gynoid obesity (15%). The percentage of women with decreased ovarian function and android obesity (93.5%) was higher compared to those with decreased ovarian function and gynoid obesity (35%). We have found the lowest percentage of women with enlarged ovaries for class I obesity (20.9%), whereas the percentages for class II obesity (46.7%), and class III obesity (46.2%) were almost equal. All the men with gynoid obesity had an abnormal sperm analysis and decreased endocrine testicular function whereas only 13.2% and 18.4% respectively of the men with android obesity had these disturbances.

Conclusions: Nutritional obesity can be associated with hypogonadism in both sexes, but females are significantly more affected than males. In men, hypogonadism is more frequent in severe or morbidly obese individuals. Android obesity in females is strongly related to hypogonadism, whereas according to our findings all the males with gynoid obesity are hypogonadic.

MUSCULAR AND FAT MASS CORELATED WITH THYROID VOLUME IN HEALTHY PERSONS FROM NON-IODINE DEFFICIENT AREA
E. Circo, S. Circo, I. Chirca
"Ovidius" University - Department of Endocrinology, Constanta, Romania

Objective: Measurement of thyroid volume in healthy subjects and goiter bearers could represent a modality to evaluate the dynamics of goitrogenesis within a given territory. The involvement of certain somatic variables could be correlated to thyroid volume variations.

Methods: Anthropometric evaluation has been performed in 65 young subjects (without thyroid dysfunction). Muscular and fat mass being measured. The obtained values were correlated to the echographically measured thyroid volume. The anthropometric measurements had established the weight status, considering the body mass index (BMI), the adipose status, considering the percent of body fat divided by the ideal total body mass, the muscular status, obtained by correlating the previous two with the mid-brachial perimeter in contraction, divided by mid-brachial perimeter in relaxation. The mean thyroidian volume were compared, considering only the adipose and muscular status. by the anthropometric characteristics of the subjects.

Results: The thyroidian volume was:
19.01±2.4 mL in hipermuscular-hypoadipose type,
14.82±1.1 mL in hiperadipose-normomuscular type,
11.02±1.9 mL in hiperadipose-hypomuscular type,
19.61±1.2 mL in normoadipose-hipermuscular type
and 9.42±0.8 mL in hypomuscular-hypoadipose type.

Subjects with well-developed muscular mass presented significantly elevated thyroid volume in comparison to those with less developed muscular mass (p<0.01). No significant differences correlated to the fat mass have been noted.

Conclusions: Muscular mass seems to be contributory to differences in thyroid volume in a population from a territory with normal iodine intake.
IMPACT OF AN EXERCISE PROGRAM ON ARTERIAL STIFFNESS IN METABOLIC SYNDROME PATIENTS

J.H. Shin, E.N. Hwang
Department of Family Medicine, The Catholic University St.Vincent's Hospital, Suwon, Korea

Background: Some research results indicated that arterial stiffness and pulse wave velocity were major risk factors of cardiovascular diseases and they increased among metabolic syndrome patients. This study investigated the effects of continued aerobic exercise on metabolic syndrome and arterial stiffness.

Method: The subjects were 10 middle-aged female metabolic syndrome patients who underwent medical check-up, met the criteria of NCEP-ATP III and had not taken exercise over the last 3 months. The exercise program was made up of 2 dance sports programs with the level of 50-80% of HRR (Heart Rate Reserve) that lasts 1 hour 2 times a week and walking a time with the level of 13 to 15 (slightly hard- hard) of RPE (Rate of Perceived Exertion) for 10 weeks. The level of arterial stiffness was measured by CAVI (Cardio Ankle Vascular Index) that used autonomic waveform analyzer. CAVI, anthropometry and blood sampling were conducted before and after the exercise program.

Results: CAVI that reflects the level of arterial stiffness significantly declined from 7.5±1.0m/s to 7.2±0.7m/s after the exercise program (P=0.037). Waist circumference significantly decreased from 91.2±6.9 Cm to 87.8±5.4 Cm (P=0.008), systolic blood pressure from 126.1±12.5mmHg to 121.6±10.4mmHg (P=0.037), fasting blood sugar from 102±18.9mg/dL to 90.2±16.3mg/dL (P=0.047), and triglyceride from 184.5±65.7mg/dL to 152.2±67.5mg/dL (P=0.047). After the exercise program, 6 subjects with 4 risk factors of metabolic syndrome and 4 subjects with less than 4 factors decreased to 2 subjects and 2 subjects, respectively.

Conclusion: Aerobic exercise significantly induced improvement of arterial stiffness and clinical indices among metabolic syndrome patients.

RESULTS OF COGNITIVE – BEHAVIORAL THERAPY TOGETHER WITH SELF-ADAPTING PROGRAM IN OBESITY MANAGEMENT IN OUTPATIENT CHILDREN CLINIC

Z. Marinov1, M. Nersstová1, J. Jůnová3, B. Tomášková4, D. Zemková2, U.Baráková1, P. Tláskal1
1Pediatric Out-patient Department, 2Pediatric Clinic, 3Physiotherapeutic Clinic, 4Section of nutritional support, University Hospital Motol, Prague, Czech Republic

Objective: Obesity is a result of lifestyle. Family lifestyle is usually insufficient in respect to healthy eating and physical activity. The aim of treatment is development of new principle of lifestyle based on the Training and the Follow-up programs. Program is established on cognitive – behavioral therapy and on simple and generally understandable self-adapting practices of regime, diet and physical activity. Recommendation is summaries in 8 points. Compliance is followed up during monthly visits. The 3 month Training program allows focus on the individual critical issues until new principles are incorporated. The aim of the diet and physical activity is to maintain or reduce of weight according to growth potential. Maintenance of weight within the 1 year program leads to reduction of BMI based on natural growth of children.

Methods: We have reviewed data of children during the year 2006/2007. We have completed complexes examination of 118 patients. 101 patients attended the 3 month Training program and 21 completed the 9 month Follow-up program. All patients were evaluated according the age, gender, level of obesity on entrance visits, other diagnosis, family and psychosocial background, school results, management of free time and self-reflection.

Results: The Training program has been successfull in 75% patients. Progresive weight reduction have continued similiarly in the Follow-up program. Decrease of BMI of 0.3 SD can be reocognised already after 3rd visit / 3rd months and even decrease of 0.8 SD after 8th visit/ 1 year independent of age, gender and obesity level. The Training program can be used for quick identification of nonresponders and low responders after 3rd visit. Even 65 % of patients have not completed the Follow-up program, we have been energysed by cooperative patients that had significant weight reduction.

Conclusions: Congitive behavioral therapy together with self-adapting program is successfull in children obesity reduction. even compliance is low.
THE EFFECT OF A HYPOCALORIC DIET ON A GROUP OF OVERWEIGHT PERSONS

L. Radu¹, G. Negrișanu², A Dobrescu³, A. Thury Burileanu³, A. Dorn⁴

¹Railway Hospital, Timisoara, Romania; ²Emergency County Hospital nr.1, Timisoara, Romania; ³City Hospital, Mangalia, Romania; ⁴City Polyclinic, Curtici, Romania

Objective: The aim of the study was to determine whether including whole-grain foods, fruits and vegetables in a hypocaloric (reduced by 500 kcal/day) diet is efficient in weight loss. Also, we evaluated the eating patterns of the group and its adherence to the specific diet.

Methods: Data were collected from 36 females and 15 males (age: 30.7 ± 9.5 years) with overweight/obesity who completed a food habits questionnaire. The questionnaire consisted of 35 items reflecting the eating patterns and behaviours, socioeconomic level, smoking status, physical activity. Anthropometric measurements were taken. Each person in the group received an individualized hypocaloric diet plan (1200-1800 kcal) for 6 weeks and then, at 2nd visit, a normocaloric diet for another 8 weeks. The recommendations in both diet plans emphasized fat reduction, increased intake of fruits and vegetables (5 or more servings/day) and an increased consumption of whole grains foods. The statistical method used was the percentage one.

Results: 12 persons (9 females, 3 males) (23.5%) attended the 2nd visit, the mean age in the compliant group was 29.8 ± 12.7 years, the mean weight loss was 8 ± 4%, the bigger weight loss was associated with a higher BMI. The evaluation of questionnaires revealed an unhealthy life style and eating patterns of the study group (53% had no breakfast, 27.4% used to eat during the night, 37.2% used to eat fast-foods at least 4 times weekly, 88.2% had a high intake of sausages daily, 64.7% use to drink beverages with added sugar daily, 31.1% declared at least 30 minutes of physical activity daily).

Conclusions: Substituting foods high in energy density with foods rich in fiber, with low glycemic index, low energy density, like whole grains, fruits and vegetables is efficient in a weight management plan. The adherence on a hypocaloric diet is associated with the state of satiety given by that diet. A diet rich in whole grains, fruits and vegetables provides satiety.

COMPLICATION AFTER LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING WITH DIFFERENT BAND TYPES

V.V. Grubnik, V.P. Gollyak, O.V. Grubnik

The department of surgery No1, Odessa State Medical University, Odessa, Ukraine

Objective: Laparoscopic adjustable gastric banding is one of a popular method for the treatment of morbid obesity. Many devices from different companies are now available. The aim of this study was to compare the results of different types of Lap-Band.

Methods: Randomized study was conducted from 2002 to 2007. Two consecutive groups were analyzed. Group A consisted of 52 patients with morbid obesity (mean BMI=43.5 ± 5.2 kg/m²; women – 45, men – 7, age 28-58 years) who received the Lap-Band (“Inamed”, USA and “Endomed”, Ukraine). Group B consisted of 49 patients (mean BMI=45.8 ± 6.4 kg/m²; women – 40, men – 9, age 30-56 years), who received the band (“Minimizer”, Germany) which contains eyelets. All the bands were placed above the lesser sac by the perigastric approach. Mean duration of laparoscopic operation in group A was 72±15 min, in group B - 65±12 (p>0.05).

Results: There were no postoperative mortality. 4 (7.7%) early complication were observed in group A (1 postoperative pneumonia, 2 early displacement of the band, 1 band erosion); and 1 (2.3%) in group B (1 bleeding from acute ulcer). After a follow-up of 5 years, the displacement rate of the band was 9.6% in group A and 0% in group B. 4 patients from group A had reoperation for band displacement and for band migration. After 3 years, the average loss of excess weight was 47% in group A and 53 % in group B (p>0.05).

Conclusion: The efficacy with respect to weight loss was equivalent with both types of band. With the Minimizer band no band slippage, erosion and no band migration was observed.
300 KG WEIGHT LOSS WITH CONSERVATIVE TREATMENT AND SURGICAL RECONSTRUCTION

C. Halmy¹, L. Halmy²
¹State Health Centre, ²Ministry of Justice and Law Infomrence², Budapest

Aim: presentation of the successful treatment of a female patient, trapped in the life-threatening circle of super-obesity and its co-morbidities.

Material and method: the patient had had an accident in her home having a weight of 120 kg and a BMI of 46.8 kg/m². Then she stayed in bed for two years and her weight reached 400 kg (BMI=156.3 kg/m²). The progressively developing co-morbidities (NYHA state IV congestive heart failure, type-2 diabetes, dyslipidemia, hypertension, chronic pyelonephritis, non-alcoholic liver steatosis, hypothyroidism, depression, alopecia) and a necrotizing dermatitis caused by drug allergy led to a life-threatening critical disease requiring hospital admission. Beside pharmacologic treatment of the co-morbidities, a 1000 kcal/day diet was applied with food supplements and later on completed with physiotherapy. When further rehabilitation was inhibited by the fat mass of the abdominal wall and the umbilical hernia, an abdominal wall reconstruction with dermolipectomy was performed.

Results: two years of treatment resulted in reaching a body weight of 154 kg and the co-morbidities showed significant improvement. A 15-kg skin-fat flap and a 10x10x15 cm hernia content, composed of intra-abdominal fat were removed by surgery. Sepsis and major wound infection caused by MRSA required incision and antibiotic treatment. Secondary wound healing was achieved by Vacuum Assisted Closure. Supportive care included clinical nutrition and treatment of the co-morbidities. She was discharged after gradual mobilization. Physiotherapy and diet continued at home resulted in ambulation in her apartment. Her actual weight is 100 kg (BMI=39.1 kg/m²), which means 300 kg weight loss since the beginning of her treatment. Co-morbidities have significantly improved. Most laboratory parameters normalized from the initial extreme values. Further improvement in her ambulation is planned by under-water exercise.

Conclusion: Super-obese patients can partially or completely loose mobility due to their body weight and co-morbidities. VLCD and the treatment of co-morbidities are inefficient in removing the subcutaneous fat inhibiting ambulation and rehabilitation. therefore surgical reconstruction may be necessary.

POSTOPERATIVE FOLLOW UP OF PATIENTS AFTER BARIATRIC SURGERY USING DATA MANAGER WWW.VOLO.CZ

M. Čierny¹, D. Zeman², R. Urbánek³
¹Bariatric and Mini Invasive Surgery Clinic, Brno Czech Republic; ²Obesitologic Centre, II. Dept of Medicine, Masaryk University, Brno Czech Republic; ³Obesitologic Centre Zlin. Czech Republic

Objective: In bariatric surgery the need for a storage, evaluation and management of multiple outcome data led to establishment of an electronic database with secured sensitive data.

Methods: The electronic database has been established according to need of bariatric surgeon to help the management of follow up data in patients after weight loss surgery. The follow up criteria include not only the achieved weight loss but also changes in comorbidities and changes in quality of life. The input data consist of weight (in kg), comorbidities status (according to BAROS) and quality of life issues (according to Moorehead-Ardelt questionnaire). The software calculates itself various indeces as EWL (%), EBMIL (%) and forms a graphs. The sensitive data has been electronically secured and can be neither unwillingly abused, nor lost.

Results: Preliminary short term data from the use of “volo.cz” web page by a single bariatric centre cooperating with two major obesitologic centres helps and show substantial improvement in comorbidities of bariatric patients after surgery.

Conclusions: A standardized electronic tool is needed by all bariatric surgeons and obesitologists so that the proposed data manager www.volo.cz could help to keep a precise follow up of all patients after weight loss surgery.
**Long-term Therapy with Sibutramine**

**Objective:** The effectiveness of pharmacologic support with sibutramine along with the preservation of dietary and regimen measures is shown on a group of long-term treated patients in an obesity consulting room at the Metabolic Clinic of the University Hospital in Hradec Králové.

**Methods:** In ambulatory patients, basic anthropometric parameters as body weight, BMI, waist circumference were compared before substitution with 10 mg sibutramine and after nine-month therapy with the same amount of effective substance. Incidental rare adverse effects or therapy resistance were revealed as well. All 36 patients were included in the group treated with the same dose of sibutramine for the whole period of time. This group involved 8 men and 28 women. The average age was 47.8 years.

**Results:** The nine-month therapy with sibutramine in the followed-up group resulted in mean values of weight loss of 6.1 kg, BMI decrease of 1.6 cm and a waist circumference reduction of 205 cm. The highest body weight loss in the followed-up group reached 16 kg. The mean BMI before the therapy was 40.0 so the patients with obesity of the highest degree were concerned. Initial adverse effects such as temporary headaches, flush and perspiration were observed in three persons out of the 36 patients treated in the course of nine months.

**Conclusions:** A positive effect of sibutramine substitution on weight loss in the followed-up group of obese patients was confirmed. The most patients have continued in the therapy the subsequent months, thus a further weight loss is assumed. This antiobesity preparation with the content of sibutramine is considered a contemporary preparation for a long-term, safe and effective reduction of body weight when the basic dietary and regimen measures are sustained.

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**The Basis of Working out the Program of Dietary Rehabilitation of Patients with Morbid Obesity**

**Objective:** Modern investigations have brought out clearly that dietary treatment effectively improve both the quality of life of the obese patients and the clinical feathers of obesity-related comorbidities. There is a need to work out in details all the steps of rehabilitation programs for the patients with morbid obesity, including patients after surgical treatment (gastric bypass, vertical gastroplasty, lap-banding) according to the modern diet logical approach. Recent standards of dietotherapy are generally based on calory restriction. Long term dieting such way may lead to worsening of metabolic parameters, lean mass and water content and did not satisfy individual needs in vitamins, minerals and other micronutrients.

**Methods:** We performed computer frequency analysis in 188 patients with morbid obesity at the time of dieting and in 68 patients who've undergone bariatric operation 1-4 years ago.

**Results:** The results shows marked imbalance in micro- and macronutrient consumption such as vitamin B1, B6, B12, A, carotene deficit, mineral deficit of calcium, iron. Lack of consumption of vitamin B12, calcium and iron was greater in the patients after surgery.

**Conclusions:** So nowadays the important task is to work out the program of diet therapy which can reflect individual peculiarity of each patient with the use of meal replacement products, enteral feeding products, it will help to enlarge effectiveness of dietary correction of different risk factors, have positive influence on psychological status of obese patients.
Objective: The purpose of this study was to investigate the effect of combined exercise training on indices of obesity, lipid profile and physical fitness in overweight adolescents with mental retardation.

Methods: 32 adolescents with mental retardation (total IQ ranged from 45 to 70) were included in an experimental and a control group. Both groups were matched for age, sex, BMI and total IQ. The experimental group received combined exercise training (aerobic and strength) three times a week for 50 minutes during 10 weeks (30 sessions). Each session consisted of warming up, 10 minutes strength upper limb, 10 minutes cycling, 10 minutes strength lower limb, 10 minutes walking and cooling down. The control group performed their daily physical activity. Length (stadiometer) and weight (digital balance) were measured to calculate BMI. Waist was measured using a tape measure. Fat mass and fat-free mass were assessed by bio-impedance (Bodystat 1500 MDD). After an overnight fasting blood samples were taken to measure lipid profile (HDL, LDL, triglycerides and total cholesterol). Aerobic capacity was measured by graded maximal exercise testing (bicycle) and 6 minute walk test. Strength of upper limb respectively lower limb was measured by taking the sum of the 1 repetition maximum of biceps and triceps in both arms respectively hamstrings and quadriceps in both legs. Functional strength was assessed by hand grip strength, hand grip performance and sit-to-stand. Data were analysed using repeated measures ANOVA. Significance level was set at p<0.05.

Results: There was a significant reduction of BMI, waist and fat mass in the training group (p<0.05), while in the control group these indices were not significantly increased. Fat free mass was not significantly changed in both groups. Concerning physical fitness peakVO2, peak wattage, 6 minute walk distance, strength of upper and lower limb and hand grip performance were significantly increased in the exercise group (p<0.05). The outcome of sit-to-stand and hand grip strength had a tendency to increase (p<0.1). In the control group these indices where not significantly changed. Concerning the lipid profile the ratio of total cholesterol to LDL was significantly decreased in the exercise group (p<0.05), while it was increased in the control group.

Conclusions: Combined exercise training has a positive effect on indices of obesity, physical fitness and lipid profile in overweight adolescents with mental retardation.

Objective: Therapeutic education takes its place among the revolutionary bio- psycho- social approach of the medical care in Romania. First used in diabetes care education, we literary struggle to initiate and perpetuate medical courses for primary care and ambulatory care medical services providers.

Methods: Our project –Therapeutic Education for Patients with Chronic Diseases - has been initiated the early 2007 and is developed now for three counties in Romania. The program has four “steps”, each of them for three days, and it consists of interactive role playing, psychological group projects, evaluation tests and power point presentation of the main topics. We have involved psychologists, complementary therapists, actors, drama artists and musicians.

Results: We gather experience every day within chronic patients with obesity, diabetes, and alcoholism. We have organized support groups for patients( alcoholism and obesity), and also we have introduced a new form of support group,” mixed” with patients and doctors, - a group that we use in all interactive work groups to illustrate and exemplify for example the roles in the “ dramatic triangle”, or the spontaneous attitudes from the medical check ups.

Conclusions:
1. The initial self evaluation of the “TPE need” was of 100% to both groups.
2. Personality is influentating “a lot” our reactions, but if we are doctors, the space of our reactions related to personality is to be reduced to a sphere which is embracing the patient’s personality.
3. For facilitants were few representatives and this is the personality wanted for all medical care providers… and controlants were so widely represented, we have applied in addition our tests for spontaneous reactions, which
4. Confirmed the fact that in this moment, Romanian medical care providers are sti on the stage/directorial position with their patients, despite their self evaluation for a need in improving their patient- doctor relationship.
Objective: Find out if and how may influence the occupation on obesitology the lost of weight after adjustable gastric band.

Methods: Case study based on clinical interviews and questionnaires with nurse after lap-band surgery working at obesitology department.

Results: Working on obesitology has its pros and contras for a person with lap-band. The strongest influence was reported on motivation for reducing weight. Being watched and allowed to ask an advice every time needed helped. Also the complications of non-compliant patients were warning. Counseling others through own experience has supportive role. On the other hand external control based on colleague’s advices was being misinterpreted by both sides. The fear from complications rose.

Conclusions: Every day contact with obese patients and obesity specialists as colleagues at work was found positively motivated for loosing weight, although the unpleasant situations may appear.

Objective: Type 2 diabetes mellitus (T2DM) is strongly associated with obesity in most but not all ethnic groups, suggesting important ethnical differences in disease susceptibility. Leptin, the product of the ob gene, could have a significant role in the pathogenesis of obesity and non-insulin-dependent diabetes mellitus. The aim of this study was to investigate the effects of diabetes on plasma leptin concentrations in obese subjects and its relationship to anthropometric indices.

Methods: In this case-control study, 35 obese subjects with type 2 diabetes as case group and 35 non-diabetics obese as control group recruited: Fasting lipid profile was measured by the enzymatic methods. NycoCard HbA1c Kit was used to measure HbA1c. The Serum leptin, insulin and glucose levels were measured by an enzyme immunoassay, using a commercially available kit and glucose oxidase methods respectively. The insulin resistance index was calculated using fasting glucose and insulin by homeostasis model assessment (HOMA-IR).

Results: The mean insulin resistance index (HOMA-IR), HbA1c, diastolic blood pressure, triglyceride and fasting glucose in diabetic patients were significantly higher than non-diabetic subjects (P < 0.05). There was a significant difference in serum leptin levels between diabetics and non-diabetics (30.36 ± 2.46 vs. 21.51 ± 2.18) and were significantly higher in women than men (31.85 ± 4.49 vs. 12.80 ± 2.07 in diabetic) and (36.11 ± 2.52 vs. 23.55 ± 3.93 in non-diabetic) in both groups. There was a positive and significant correlation between serum leptin levels with hip circumference, gender and BMI (r = 0.666, p = 0.000 in diabetic and r = 0.490, p = 0.003 in non-diabetic) in both groups.

Conclusion: It is found that serum leptin level is lower in diabetic obese subjects than non-diabetics. In addition, it is even lower in the poorly controlled diabetic patients. Therefore, it is suggested that further studies are required to make clear the mechanisms of being lower leptin levels in obese diabetic subjects.

Key Words: obesity, type 2 diabetes, leptin, HOMA-IR, BMI
OBJECTIVE: Recently studies revealed that oral dehydroepiandrosterone (DHEA) reduced weight gain in genetically obese mice. Another study suggested that maintaining high levels of dehydroepiandrosterone sulfate (DHEA-S) might prevent the development of obesity. The aim of this study was to evaluate the relationship between DHEA and DHEA-S with anthropometric indices in obese women with different grades of obesity.

METHODS: This cross-sectional study consisted of 35 women (BMI = 18.9-24.9) as normal weight, 33 women (BMI = 25-29.9) as overweight, 36 women (30-34.9) as obese grade I, 33 women (BMI = 35-39.9) as obese grade II and 33 women (BMI ≥40) as obese grade III were enrolled. The body-mass index was defined as the weight in kilograms divided by the square of the height in meters. Serum levels of dehydroepiandrosterone, dehydroepiandrosterone sulfate and glucose were measured by commercially available enzyme immunoassay kits and glucose oxidase method, respectively.

RESULTS: There was a negative and significant correlation between DHEA and age in normal (r=-0.492, P=0.003) overweight (r=-0.453, P=0.008) obese I (r=-0.409, P=0.01) obese II (r=-0.402, P=0.02) and obese III (r=-0.394, P=0.02) groups, respectively. Also, there was a negative and significant correlation between DHEA-S and age in normal weight (r=-0.459, P=0.006), overweight (r=-0.374, P=0.032) and obese grade I (r=-0.357, P=0.032), respectively. We found positive and significant correlation between dehydroepiandrosterone and frame size of individuals in obese I, Obese II and Obese II subjects. There was a positive and significant correlation between dehydroepiandrosterone sulfate and frame sizes of individuals in overweight obese I and Obese II subjects.

CONCLUSION: It is found that Serum levels of DHEA decreases with increasing grades of obesity but Serum levels of DHEA-S increases in concordance with increasing obesity.

Key words: Obesity, BMI, DHEA and DHEA-S
EVALUATION OF HEALTH STATUS IN CHILDREN WITH OBESITY

E. M. Yakunova
Chair of pediatrics, Samara State Medical University, Samara, Russia

Objective: The aim of our study is to reveal functional disorders of different organs and systems in children with obesity on the clinic-laboratory and instrumental data and to determine their influences on the children’s health status.

Methods: We have made retrospective analysis of 109 case histories of children with exogenic constitutional obesity staying in endocrinology department of City Children’s Clinic No1 in Samara from 2000 to 2006. 68 of them is boys and 41 girls at the age from 3 till 17. Control group contains 50 children of the same age.

Results: On admission besides the main complaint on overweight many children also noted headaches, vertigo, periodical elevation of arterial blood pressure, pains in heart area and stomach. On clinical examination was revealed more frequent elevation of diastolic blood pressure. The glucose level more then 5.5 mmol/l was noted in 12.3% cases. Changes of glucose tolerant test were revealed in 46.8%. Some changes in biochemical blood analysis concerning lipid exchange such as increased level of cholesterol and B-lipoproteins are observed. The findings of the cardiogram detected different disorders of peacemaker migration and conduction in quarter of children. Hypertrophy of different parts of the heart was revealed in 13.8% of cases. With the help of ultrasound investigations of abdomen features of hepatomegaly, diskinesia of biliary duct, abnormality of gallbladder associated in some cases with fatty hepatoses and pancreatopathia were registered.

Conclusions: The presence of elevated diastolic arterial blood pressure together with left atrium hypertrophy is the sign of development of symptomatic arterial hypertension. Metabolic disorders concerning carbohydrate and fat metabolism which appeared on the early course of obesity supposed future development of complete metabolic syndrome.

PROGENY OF HIGH-FAT FED PARENTS DEVELOP IMPAIRED CARDIAC FUNCTION IN THE ABSENCE OF OBESITY OR PERIPHERAL RESISTANCE

R. Pereira1,2, S. Sena1, B. Wayment3, J. Tuinei1, S. Litwin2, L. Carvalho3, A. Moura4, E. Abel1

1Division of Endocrinology Metabolism and Diabetes and Program in Human Molecular Biology and Genetics, University of Utah, School of Medicine, Salt Lake City, UT 84112; 2Division of Cardiology, University of Utah School of Medicine, Salt Lake City, UT 84132; 3Departamento de Histologia, Universidade do Estado do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 4Departamento de Physiological Sciences, Universidade do Estado do Rio de Janeiro, Rio de Janeiro, RJ, Brazil

Objective: Maternal overnutrition is associated with long-term consequences, particularly obesity, insulin resistance, type 2 diabetes and cardiovascular diseases.

Method: We investigated cardiac adaptations in the male adult offspring of C57BL/6J mice whose parents were fed either standard chow or a high-fat diet (HFD) before breeding and throughout gestation and lactation. At weaning, control and PHF (parents on a HFD) offspring were fed standard chow. At 12 weeks, systemic metabolic parameters and cardiac function and metabolism were investigated.

Results: Body weight and body composition were unchanged. Moreover, fasting plasma levels of glucose, insulin, and free fatty acids as well as insulin-glucose ratios did not differ significantly between the groups. Although systemic parameters were normal, insulin-stimulated Akt phosphorylation was reduced in PHF mice. By echocardiography, we observed increased cardiac mass and posterior wall thickness, and reduced fractional shortening and ejection fraction Working heart study showed that these mice had impaired glycolysis and cardiac power. Quantitative RT-PCR demonstrated that offspring of high-fat fed parents also displayed down-regulation of VLCAD and CPT2 genes.

Conclusions: These data strongly suggest that parental high-fat diet induces cardiac abnormalities in the offspring, even while not causing obesity and peripheral insulin resistance.
MATERNAL NICOTINE EXPOSURE DURING LACTATION PROGRAMMES FOR OBESITY AND THYROID DYSFUNCTION IN ADULT RATS

E. Oliveira¹, I.H. Trevenzoli¹, C.R. Pinheiro¹, A.P. Santos-Silva¹, M.C.F. Passos², E.G. Moura¹, P.C. Lisboa¹

¹Biology Institute, ²Nutrition Institute, State University of Rio de Janeiro, Brazil

Objective: Some studies have shown a strong correlation between stressful events (nutritional, hormonal or environmental) in early life and the development of adult chronic diseases. Epidemiological and experimental data show an association between maternal smoking compounds exposure and later obesity. Besides, smoking can affect the thyroid gland function. Then we evaluated whether maternal nicotine exposure during lactation influences the adiposity, the thyroid status and others metabolic parameters in adult life of the rat offspring.

Methods: On the 2nd day of birth, lactating rats were divided into: 1) NIC, with osmotic minipumps implanted s.c. releasing nicotine (6mg/Kg/day) during 14 days of lactation; 2) C, with osmotic minipumps releasing saline at the same period. After weaning, we evaluated the body weight gain and the food intake of the offspring until they were 180 days-old, when they were killed to evaluate the serum hormone concentrations (leptin, TSH and free thyroid hormones) by radioimmunoassay and the body fat content by computed tomography and carcass method. It was also determined glycaemia, triglycerides, total cholesterol and its fractions.

Results: After 85 days-old, NIC-offspring showed lower relative food intake. At 180 days-old, these rats presented higher body weight (+11%, p<0.05), central and total adiposity (+32% and +36%, p<0.05 respectively), as well as hyperleptinaemia (+36%; p<0.05). Regarding the thyroid function, NIC-offspring had lower serum TSH (-35%; p<0.05), FT4 (-11%; p<0.05) and FT3 (-25%, p<0.05). The lipid profile and glycemia was unchanged in this group.

Conclusions: We evidenced that early nicotine exposure programmes for a higher adiposity, hyperleptinaemia and hypothyroidism in adult life. We suggest that nicotine can be one of the tobacco compounds responsible for later central obesity (one of the components of the metabolic syndrome), after neonatal exposure.

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WEIGHT LOST AND IMPROVEMENT OF GLYCEMIC CONTROL OF OBESE TYPE 2 DIABETIC PATIENT AFTER REPLACEMENT OF INSULIN TREATMENT BY ORAL ANTIDIABETICS

M. Szabó¹, P. Pelíšková¹, M. Matouš², E. Novotná², M. Kvapil²

¹Department of Medicine, Charles University, 2-nd Medical School, University Hospital Motol, Prague, Czech Republic, ²Department of Sport Medicine, Charles University, 2-nd Medical School, University Hospital Motol, Prague, Czech Republic

Objective: The aim is the study of the effect of replacing of insulin therapy with oral antidiabetics (OAD) on weight lost and on the glycemic control in obese type 2 diabetic (DM2T) patients.

Methods: 53 obese (BMI 36.1±3.7) patients (30 females, 23 males) with mean age of 56.7±8.3 years having DM2T diagnosed for 12.3±6.8 years, treated with insulin for 4.5±4.4 years with an average dose 55.3±24.2 UI insulin daily having a sufficient secretion of endogenous insulin determined by C-peptide were enrolled in the study. Their insulin treatment was replaced by OAD such as metformin, rosiglitazone, glimepiride, gliclazide in mono- or combination therapy. BMI, waist circumference and sagittal abdominal diameter (SAD) measured in lying position were used for weight changes and the control of diabetes was measured by HbA1c (calibration IFCC). Wilcoxon Signed Ranks Test and Spearman correlation were used for statistic analysis.

Results: One year after discontinuation of insulin therapy patients decreased the BMI from 36.1±3.7 kg.m⁻² to 33.9±4.4 kg.m⁻² (p<0.0001), the waist circumference from 117±9.7 cm to 111.1±10.9 cm (p<0.0001), the SAD from 28.3±3.2 cm to 26.9±4.4 cm (p<0.001) and the HbA1c level decreased from 7.3±1.6 % to 6.7±1.8 % (p=0.01). The decrease of the BMI correlated significantly with decrease of the waist circumference (p<0.0001; Spearman’s correlation coefficient 0.67) and with decrease of the SAD (p<0.001; Spearman’s correlation coefficient 0.46). There was no significant correlation of changes of the BMI with changes of the HbA1c level.

Conclusions: The presented data show the possibility of replacement of insulin treatment in obese DM2T patients with sufficient secretion of endogenous insulin by OAD. The patients lost weight (decreased BMI, waist circumference and SAD) and improved their glycemic control (decreased HbA1c) during one year of treatment with OAD as compared to insulinotherapy. The results are most likely due to an usually serious degree of insulin resistance in obese DM2T patients in whom OAD, especially the insulin sensitisers (glitazons, metformin), appear more physiological than insulinotherapy.
THE RELATIONSHIP BETWEEN LEPTIN PLASMA LEVELS AND BLOOD PRESSURE IN EXTREMELY OBESE CZECH INDIVIDUALS

M. Forejt1, J.A. Bienertová-Vašků2, P. Bienert1, J. Tomandl3, A. Vašků2, M. Chmelíková2, Z. Piskáčková2, K. Heczková1, L. Kučerová1

1Dept of Preventive Medicine, Masaryk University, Brno, Czech Republic; 2Dept of Pathological Physiology, Masaryk University, Brno, Czech Republic; 3Dept of Biochemistry, Masaryk University, Brno, Czech Republic

Objective: Obesity has been recognized for a long time as a strong risk factor for chronic arterial hypertension and a higher incidence of hypertension has been repeatedly reported in android-type obesity. Leptin, one of the adipokines playing a key role in energy homeostasis, is considered to of special importance in mediating obesity-related hypertension. However, its effects on the vessel walls and blood pressure remain poorly understood in humans.

Methods: The total of 64 extremely obese subjects was enrolled in the study (BMI 46.03 ± 5.63; % of body fat 50.33 ± 5.13) along with 14 normal-weighted volunteers. Basic anthropometrical characteristics associated to obesity were measured and the food intake was monitored using 7-day record method. The subjects had no previous history of cardiovascular disease, were not pregnant and were not on antihypertensive therapy.

Results: In multivariate modelling, leptin or leptin receptor plasma levels didn’t express an independent prediction role on weight, BMI, waist circumference or waist-to-hip ratio. However, its effects on the vessel walls and blood pressure remain poorly understood in humans.

Conclusions: Independently on BMI, leptin plasma level was a strong predictor of systolic blood pressure, which is well in accordance with the known paracrine effects of leptin at the vascular level. Elevation of blood pressure in the subjects with hyperleptinemia represents an interesting effect that deserves further investigation.

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SERUM LEPTIN AND INTIMA-MEDIA THICKNESS OF THE COMMON CAROTID AND FEMORAL ARTERIES IN YOUNG FEMALES WITH OBESITY

A.V. Starodubova1, D.S. Sargaeva1, O.V. Draenkova1, O.A. Kisliak1, A.M. Kopelev1, G.I. Storozhakov1, L.V. Djedjeya2, V.M. Govorun1, V.I. Sergienko2

1Russian State Medical University, Moscow, Russia; 2Research Institute of Physicochemical Medicine-Litech, Moscow, Russia

Objective: To investigate whether plasma concentrations of leptin, an adipose tissue hormone that has recently been proposed as a cardiovascular risk factor is associated with intima-media thickness (IMT), an early marker of asymptomatic atherosclerosis, in young obese female patients.

Methods: A prospective study in 30 young females with obesity (15 adolescents and 15 young women, aged 18.19±2.75 yrs, range 15 to 24 yrs; body mass index (BMI) 36.01±3.65kg/m², range 30.85–46.48 kg/m²) was performed. IMT was measured on the far wall of left common carotid artery (CCA) and femoral artery (FA) over a length of 1 cm on a reference site located 2 cm below the bifurcation by the same investigator. Serum total cholesterol, triglycerides, high-density lipoprotein cholesterol were determined and oral glucose tolerance test was performed.

Results: Mean serum leptin level was 53.9±12.76 ng/ml (23.5 to 67.2 ng/ml). 92.3% of patients had elevated levels of leptin. There were no significant difference between female adolescents and young women on leptin levels, CCA and FA IMT. Mean CCA IMT and FA IMT were 0.56±0.07 mm (0.4 to 0.6 mm) and 0.51±0.07 (0.37–0.70 mm). Serum leptin levels directly significantly correlated with CCA IMT (r=0.71 p<0.05) and BMI (r=0.74 p<0.05), but there were no correlation with FA IMT. Leptin serum concentrations did not correlate with total cholesterol, triglycerides, high-density lipoprotein cholesterol, fasting glucose and postload glucose levels in young obese females.

Conclusions: Elevated levels of leptin, associated with obesity, closely related to increase of CCA IMT, but not FA IMT in young females. These results suggest that the increase of adipose tissue mass and leptin may have an unfavorable influence on the early development of atherosclerosis. Probably the absence of correlation between leptin levels and FA IMT in young females may be explained by the less effect of obesity on the FA IMT or later femoral artery wall damage compared with common carotid artery.

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Objective: Pigment epithelium-derived factor (PEDF) was discovered as a 50-kDa protein. PEDF is a potent inhibitor of angiogenesis with neuronal differentiating activity. Moreover, it inhibits endothelial cell injury in vitro, suggesting the involvement of PEDF in atherosclerosis. Therefore, elucidating the relationship between serum levels of PEDF and coronary risk factors could provide a clue to understanding the pathophysiological role of PEDF in vivo.

In this study, we examined whether serum levels of PEDF were associated with metabolic syndrome risk factors.

Methods: The study was designed as a cross-sectional study. A total of 112 Caucasians (age 65.79 yr; 40 males and 72 females) with high risk of metabolic syndrome were enrolled in this study. PEDF serum levels were determined with a commercially available ELISA assay (Biovendor Research and Diagnostic Product, Inc.).

Results: PEDF showed abnormal distribution, ranging from 4.7 to 32.5 mg/l with a median of 13.2 mg/l. PEDF serum levels were not correlated with gender. PEDF was correlated with BMI ($r=0.32$, $P<0.01$), CRP ($r=0.33$, $P<0.01$), diastolic blood pressure ($r=0.3$, $P<0.01$), insulin (0.82, $P=0.02$), Quicki ($r=-0.22$, $P=0.048$). Individuals with metabolic syndrome (according to NCEP criteria) had significantly higher PEDF values (medians 15.6 vs. 11.2 mg/l, large sample test statistic $Z=2.33$, $P<0.01$) than healthy subjects (without components of metabolic syndrome). PEDF sensitivity and specificity for the presence of metabolic syndrome were 57.9%, 86.7% respectively, at a cut-off value of 14.9 mg/l (AUC 0.75, 95% CI 0.55-0.87, LR+ 4.34). Diagnostic efficacy was equivalent to that of A-FABP ($P=0.48$). Multivariate analyses revealed that measured parameters were not significant independent determinants of PEDF serum levels. However, BMI-adjusted PEDF levels were significantly higher in individuals with MS.

Conclusions: We determined the recently discovered marker PEDF with a new ELISA test. Our results confirmed that individuals with MS have significantly higher PEDF serum levels and that PEDF is an independent marker of MS with adequate diagnostic efficacy.

Objective: Occasionally normal serum triglyceride levels are measured in morbidly obese patients. This raises the questions whether serum triglyceride level correlates with body mass index and whether fat mass and fat percent influences high sensitivity C-reactive protein (hCRP) level.

Material and method: 259 obese inpatients were enrolled in the study. Mean age was 46 years (18-81 yr). Body mass index and body fat measurements were done by InBody 720. Serum triglyceride and hCRP levels were measured by regular laboratory methods. Statistical analysis was made by GraphPad Prism.

Results: The serum triglyceride level showed no correlation with body mass index in the following categories: BMI<30, 30≤BMI<35, 35≤BMI<40. In the group of BMI>40 we found a surprising negative correlation ($r=-0.1742$, $p=0.0184$). Serum hCRP levels in grade 1 or 2 obesity were significantly lower than in the morbid group ($\chi^2=5.726\pm0.9588\ N=46$, $\chi^2=11.81\pm1.191\ N=55$, $p<0.0001$). No correlation was found between BMI and hCRP levels in the group 30≤BMI<40. On the other hand the group of BMI>40 showed strong positive correlation ($r=0.4610$, $p=0.0003$).

Conclusions: Serum triglyceride and hCRP levels showed correlation with body mass index in morbidly obese patients. Due to the increase in fat mass, serum hCRP showed positive, but serum triglyceride showed negative correlation. Our data support the presumption that morbid obesity is not only a quantitative difference compared to grade 1 or 2 obesity.
CHEMERIN IS AN INDEPENDENT MARKER OF METABOLIC SYNDROME IN CAUCASIAN POPULATION

D. Stejskal¹, M. Karpíšek², Z. Hanulová³
¹Department of Laboratory Medicine & Internal Department, Sternberk Hospital, Šternberk, Czech Republic; ²Department of Human Pharmacology and Toxicology, Faculty of Pharmacy, University of Veterinary and Pharmaceutical Sciences Brno, Brno, Czech Republic; ³Gnosis s.r.o., Slovakia

Objective: Chemerin is a novel adipokine that has been suggested to play an important role in the pathogenesis of metabolic syndrome. The aim of our study was to evaluate serum chemerin as a marker of metabolic syndrome and to assess its predictive accuracy in a Caucasian population.

Methods: The study was designed as a cross-sectional study. Anthropometric and serum analyses were performed for Body Mass Index, waist circumference, chemerin, insulin, triglycerides, total cholesterol, high density cholesterol (HDL-cholesterol), low density cholesterol (LDL-cholesterol), uric acid, and glucose in 55 non-obese healthy subjects and 181 at-risk subjects with possible inherence of metabolic syndrome. Chemerin serum levels were determined with a commercially available ELISA assay (BioVendor Research and Diagnostic Products, Inc). Quicki (quantitative insulin sensitivity check index) and ROC curve (receiver operating characteristic curve) were determined and subjected to the Chi-square analysis.

Results: Compared with healthy controls, subjects with metabolic syndrome had significantly higher chemerin serum levels (medians: 266.0 vs. 192.5 µg/l; P < 0.01). After further chemerin adjustment, the difference between both subgroups persisted. Chemerin serum levels correlated with age (r=0.23, P<0.01), serum glucose (r = 0.23, P < 0.01), HDL-cholesterol (r = -0.19, P < 0.01), triglycerides (r=0.22, P< 0.01), systolic and diastolic blood pressure (r=0.40, P < 0.01; r=0.24, P < 0.01) and the number of metabolic syndrome risk components (r=0.47, P< 0.01). At a serum chemerin cut-off level of 240 µg/l, the presence of metabolic syndrome was diagnosed with 75 % sensitivity and 67 % specificity. The results demonstrate that serum chemerin level is associated with characteristics of metabolic syndrome.

Conclusions: Serum chemerin level is associated with characteristics of metabolic syndrome and might be an independent marker of metabolic syndrome in Caucasian population.


A. Baráková, D. Spáňová, Z. Kuchtová, P. Hlava, Z. Vallová
National Center of Health Information, Slovak Republic

Aims: To analyze from official health statistics chosen indicators of health status of respondents with metabolic syndrome (MS) detected during the realization of the project in 2002.

Materials and Methods: Out of 6 847 respondents aged 15–64 years 5 306 persons were identified. Among groups of persons with different risk profile, with emphasis to MS, the persons hospitalized within 5 years for diseases of the circulatory system (DCS) (ICD-10 codes I00-I99), malignant tumors (MT) and diabetes mellitus (DM) were analyzed. In the year 2002, the prevalence of MS (criteria according IDF, calculated from the data of six model districts of Slovak Republic) for ages 15–24 was 4 % and for ages 25–64 31 %. MS prevalence was growing with age; the prevalence for ten-years-age groups (from 25–34 years up to 55–64 years) was as follows: 13.1 % – 25.2 % – 42.2 % and 53 %.

Results: Out of death cases reported until 31.1.2008 (113 men, 39 women), 30 % of men and 41 % of women died with the presence of MS. By 31.6.2007 among respondents with MS hospitalized for DCS, MT and DM, every 6. man (15.9 % of 711 males) and every 8. woman (13.2 % of 944 females) without DM were hospitalized. Among respondents with MS and DM every 3. man (34.9 % of 63 male diabetics) and 3. woman (37.8 % of 74 female diabetics) were hospitalized. Analyzing mean hospitalization time for DCS, MT and DM higher rates were found in men with MS and DM: 18.8 days (versus 16.5 days in women) and in women with MS without DM - 17.2 days (versus 15.9 days in men).

Conclusions: People with MS, particularly diabetics, represent an important social, health and economic problem; however many of risk factors could be minimalized. The high prevalence of MS and other risk factor in population of Slovak Republic contributes to unfavorable incidence and mortality rates especially in the group of DCS and MT (in comparison with other developed countries). The current health status of the population of the Slovak Republic was the reason for preparing new national intervention programs, emphasizing particularly the need of systematic education of population.
THE INFLUENCE OF OBESITY ON THE STRUCTURE-FUNCTIONAL STATUS OF VARIOUS ORGANS OF HUMAN BODY

Ltd “Healthy Life”, Tbilisi, Georgia

Objective: Nowadays obesity is a major public health issue and effective treatment of it has become an important clinical focus. Patients with obesity face obvious cosmetic and quality-of-life problems. Therefore the aim of our study was to reveal all possible “weak spots” in patients with obesity and to create the adequate treatment schemes according to the investigation results.

Methods: 6525 obese patients with different degrees of obesity underwent a complex of analyses (oral glucose tolerance test, insulin, blood test, blood lipids, electrolytes, coagulation test, liver functions, ECG, urine analyses, ultrasound of thyroid, breast, abdomen, gynecology, knee, densitometry, thyroid stimulating hormone, leptin) which was created in our clinic to investigate the functioning of practically whole organs of human body which could be affected by obesity.

Results: Practically all of the organs of the human body are affected by obesity. Various alterations from mechanical to metabolic perturbations were revealed. In all of the patients individually created diets where prescribed in combination with medications if needed.

Conclusions: Our offered complex investigation of the patients with different degrees of obesity is useful to create effective, individual, pathogenic oriented treatment schemes.

OBESITY AS RISK FACTOR OF NAFLD – SITUATION AT MEMBERS OF ARMY OF CZECH REPUBLIC

J. Fajfrova, V. Pavlik, P. Hlubik
Dept. of military hygiene, Faculty of Military Health Sciences, University of Defence, Hradec Kralove, Czech Republic

Objective: The purpose of this task is assessment of occurrence of obesity in relation to other risks factor of NAFLD from current data from Program of preventive care of Army of Czech Republic.

Methods: In Czech army is realized the Program of preventive care from the year 1999 to present. Within the Program was done physical examination (blood pressure, heart rate), anthropometry (weight, height, 4 skinfolds thickness), biochemical analysis (blood sugar, total cholesterol, HDL-cholesterol, LDL-cholesterol, triacylglycerol, ALT, GMT, creatinine).

Results: In the year 2007 were examined 5652 men and 662 women. 68.5 % of men have BMI over 25 and 12 % have BMI over 30. At women, 30% have BMI over 25 and 6 % have BMI over 30. ALT was elevated at 21 % (men) and 8 % (women), GMT was elevated at 15 % (men) and 4 % (women). 85 % of men with elevated ALT or AST have BMI over 25. 60 % of women with elevated ALT and 56 % with elevated GMT have BMI over 25.

Conclusions: In army is still high number of soldiers with overweight or obesity. But on the other hand the situation is better than at civilian population of Czech Republic. Relatively high percentage of men has elevated hepatic enzymes. Nearly all of men and half of women with elevated hepatic enzymes have overweight or obesity. Our results indicate that is important and necessary in care of overweight or obese patients to thinking even at potential liver disease.
LIPID PROFILE CONCERNING OBESE CHILDREN AND ADOLESCENTS BEFORE AND AFTER SIGNIFICANT WEIGHT LOSS

M. Nikolic1, M. Golubovic2

1School of medicine, University Of Nis, Serbia; 2School of medicine, University Of Kragjujevac, Serbia

Objective: The purpose of this model is to was to monitored the lipid profile of obese children before and after significant weight loss.

Methods: Sixty obese children (37 girls and 23 boys), average age 11.37 ± 2.48 year, who took part in the weight reduction program in The Counseling Service for well-balanced diet of the Institute for Public Health in Nis, were examined. The measurements were taken at the beginning of the research and 10 weeks later. Anthropometric changes and the changes of the level of lipids in serum (total cholesterol, triglycerides and LDL-cholesterol) were recorded for all participants in the study.

Results: Carrying out of the reduced diet during the period of 10 weeks showed that body weight in the examined children had been greatly reduced (p<0.01). Statistical significant reduction of all the examined parametres of the lipid profile was detected (p<0.01).

Conclusions: Results show that the combination of the diet-therapy, increased physician activity and behavior modification is efficient in reducing of the total cholesterol, triglycerides and LDL-cholesterol as far as obese children are concerned.

EFFECT OF LIFESTYLE MODIFICATION PROGRAM IN REDUCTION OF CARDIAC RISK FACTORS IN PATIENTS WITH CORONARY HEART DISEASE

A. Afshin Khaki1, J. Shahamfar1, M. Shahamfar2

1Islamic azad university, Bonab branch, Bonab, Iran; 2Tabriz university of medical sciences, Tabriz, Iran

Objective: This study was conducted to evaluate the effect of a teaching program on patients with myocardial infarction by modification of risk factors or behavior changes.

Methods: ONE Hundred patients out of those who admitted to the CCU ward of Shahyd Madani Heart Hospital from January to September, 2004, were randomly selected. 50 were assigned to a teaching group and 50 to a control group. An individualized teaching program was delivered to the teaching group during the hospitalization period. It covered aspects such as: the characteristics of heart disease, the anatomy and risk factors of atherosclerosis, diet and exercises therapy. When these patients were discharged to their home, they received educational package for 6 months. The lifestyle and risk factors of patients such as smoking, research blood pressure, pulse, blood lipid profile, BMI and Waist Hip Ratio (WHR) were measured before and after the teaching program.

Results: Initially there was no significant difference in the number of non-smokers. After post testing the results revealed that the number of non smokers had significantly increased in teaching group from 66% to 90.1% (CI95% 0.55-0.81 vs 0.82-0.98, P<0.05). The number of Patients who exercised, significantly increased after teaching program from 30% to 88% CI95%0.55-0.81 vs 0.82-0.98, P<0.05) while no significant change was shown by the control group. The results showed that WHR of case group before education was in abnormal range (1.01) compared with control group (0.99), while after education the mean WHR reduced in case group (0.98), this difference in WHR was found to be statistically significant.

Conclusion: The above findings suggest that the individualized teaching program might be helpful at reducing the risk factors of atherosclerosis in patients with myocardial infarction.
The presentation points out the connection between the pulse wave velocity playing an important role defining the complete cardiovascular risk as one of the deciding factors influencing cardiovascular prognosis, and regular workout as main prevention implement.

The arteriorgraphic examinaton involved a comparatively/relatively great number of volunteers whose majority had no symptoms and had not been treated previously.

Aims: Measure the impact made by regular workout (measurable physical activity), and arterial stiffness and the central systolic blood-pressure. Define the protective effect/influence of physical workout after quit while keeping BMI between/within the normal range. How does obesity and overweight itself rise central systolic blood-pressure without any other illness present?

Results: There is a significant correlation among regular workout, arterial stiffness (PWVao), augmentation index measured in the aorta (Aixao), and the central systolic blood-pressure based on Aixao (SBPao).

It’s significance is given by the elevated arterial stiffness, one of the earliest signs of the arteries’ inelasticity.

Objective: Adiponectin and leptin are cytokines with controversial effect, both secreted by adipose tissue. Their ratio has been suggested as a new atherogenic index in obese patients with type-2 diabetes mellitus. The aim of our study was to compare adiponectin/leptin ratio in patients with metabolic syndrome (MS) and overweight persons without other metabolic disturbances (CON).

Methods: Group of MS consisted of 31 persons (23/8 M/F), age 55.8 ± 8.3 years. CON group included 21 overweight persons (13/8 M/F), age 48.9 ± 10.1 years. Anthropometric and biochemical parameters were measures by standard routine methods, leptin and adiponectin by radioimmunoassay.

Results: Group with MS revealed significantly higher body mass index (30.2 ± 0.7 vs. 27.1 ± 0.7, P < 0.05), waist circumference (103.6 ± 1.4 vs. 91.3 ± 1.9 cm, P < 0.001) as well as waist-to-hip ratio (0.98 ± 0.01 vs. 0.90 ± 0.07, P < 0.001). No changes were observed for both systolic and diastolic blood pressure. Parameters of glucose metabolism were also increased in the MS group (all P < 0.01): glucose 5.9 ± 0.3 vs. 4.7 ± 0.4 mmol/l, insulin 11.6 ± 1.1 vs. 7.2 ± 0.9 µU/ml, C-peptide 1.06 ± 0.06 vs. 0.77 ± 0.05 pmol/l and HOMA-IR 3.18 ± 0.38 vs. 1.51 ± 0.45. Value of QUICKI index was significantly decreased (0.33 ± 0.01 vs. 83.2 ± 0.01, P < 0.001) and concentration of CRP increased (5.6 ± 0.9 vs. 2.9 ± 0.5 mg/l, P < 0.05). Concentrations of cholesterol and triglycerides were higher in the MS group (6.44 ± 0.28 vs. 5.46 ± 1.00 mmol/l, P < 0.05, and 4.49 ± 0.95 vs. 1.38 ± 0.43 mmol/l, P < 0.01, respectively), as well as those of apoB and nonesterified fatty acids (1.40 ± 0.05 vs. 1.13 ± 0.03 g/l, P < 0.01, and 0.57 ± 0.06 vs. 0.41 ± 0.04 mmol/l, P < 0.05). No significant changes were observed in concentrations of HDL-cholesterol, apoA1, LDL-cholesterol, conjugated dienes, uric acid and homocysteine. Concentrations of adiponectin were decreased and those of leptin were increased in the MS group, however, their differences did not reach statistical significance. The ratio adiponectin/leptin was significantly lower in the MS group (0.81 ± 0.13 vs. 1.82 ± 0.56, P < 0.01).

Conclusions: All observed differences in biochemical parameters are result of the presence of MS, in comparison with simple overweight without further metabolic disturbances. The adiponectin/leptin ratio seems to be a good potential biomarker for the prevalence of MS.

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Objective: According to some authors both insulin resistance and hyperhomocysteinemia may play a role in the pathogenesis of depressive disorder, but mechanisms of these relations remain unclear up to now. The aim of this pilot study was to compare parameters glucose homeostasis and plasma homocysteine levels in non-obese patients with depressive disorder (DD) and overweight persons without other metabolic disturbances (CON).

Methods: Group of patients with DD consisted of 19 persons (9/10 M/F), age 56.9 ± 7.0 years, group CON included 21 overweight persons (13/8 M/F), age 48.9 ± 10.1 years. Anthropometric and biochemical parameters were measured by standard routine methods, the concentrations of serum homocysteine (Hcy) were determined using high-performance liquid chromatography according to Araki and Sako, folic acid and cyanocobalamine concentrations were assessed with a chemiluminescent assay, conjugated dienes in precipitated LDL, plasma insulin (IRI), C-peptide, non-esterified fatty acids (NEFA) were determined and indexes of insulin resistance (homeostasis model assessment, HOMA) and Quantitative Insulin Sensitivity Check Index (QUICKI) were calculated.

Results: Group with DD revealed significantly lower body mass index (24.9 ± 0.6 vs. 27.1 ± 0.7, P < 0.05), waist circumference (87.3 ± 0.9 vs. 91.3 ± 1.9 cm, P < 0.01), and lower both systolic and diastolic blood pressure. Concurrently they had significantly increased insulin 9.3 ± 0.61 vs. 7.2 ± 0.9 µU/mL, C-peptide 0.88 ± 0.06 vs. 0.77 ± 0.05 pmol/l and HOMA-IR 2.16 ± 0.23 vs. 1.51 ± 0.45 (all P < 0.05). Concentrations of triglycerides were higher in the DD group (2.26 ± 0.56 vs. 1.38 ± 0.43 mmol/L, P < 0.05), as well as those of non-HDL-cholesterol 5.07 ± 0.37 vs. 4.18 ± 0.26 mmol/L, all P < 0.05). Concentrations of Hcy were increased in DD group (18.1 ± 1.21 vs. 13.7 ± 0.96 µmol/L, P < 0.05), while those of folate and cyanocobalamine did not differ significantly. Concentrations of CD in LDL were higher in the DD group (79.83 ± 2.96 vs. 60.35 ± 3.10 µmol/L, P < 0.05).

Conclusions: Persons suffering from depressive disorder revealed in this pilot study some features of insulin resistance despite they were characterized by lower weight, BMI, waist circumference and blood pressure. These findings deserve further investigation in the greater set of probands.

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THE MEASURING OF BODY COMPOSITION IN THE DIABETOLOGY PRACTICE

I. Sal

Health Care Service in Zugló-Budapest

Objective: Our aim was to get some useful working experience with the machine of BIA 101 Body impedance analyzer. This system is suitable for measuring the following parameters with the Bodycomp V.8 software:
- body cell mass: kg and % (BCM)
- total body water: litre and % (TBW)
- extracellular water: litre and % (ECW)
- fat mass: kg and % (FM)
- fat free mass: kg and % (FFM)
- extracellular mass: kg and % (ECM)
- basal metabolism (BMR)
- hydration of the fat free mass: %

Methods: We made the measures into two illness groups. Into the first group we divided those patients, who got bodyweight reducer treatments (diet and diet+drug), into the second one we put those patients, who are diabetic treated with rosiglitazon. In connection with the first group we started the examination because of the following statement: “Real bodyweight reducement can be valuable only with the relation of measuring the bodyfat.” (Pados: Overweight- obesity) The other group was examined not only the experience in the clinical practice, but also because of the Hungarian Pharmacopeia says the reason: “The rosiglitazon can occur fluid retention, which can produce heart failure. The marks and symptoms of the fluid retention including the weight increasing must be monitoring. We have to calculate individuallly the role of fluid retention in the body weight increasing.”

Results: In both groups we checked not only the BMI, but also the hydration, the FM%, the BCM%, the ECW% changes. I would point out a 68 year-old diabetic woman case from the first group. She had a three months poor caloric diet (1200 calories, 125 gr carbohydrate), and during this she got the following changes:
- BMI: 34.5-31.6
- Hydratation%: 79.0-76.3
- FM%: 44.5-41.2
- BCM%: 41.6-45.6
- ECW%: 54.9-51.0

In the group of rosiglitazon we made at 17 patients body composition measures up today, out of these there were 6 male and 11 female. We show with the following parameters the difference between the sexes:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>35.0</td>
<td>38.0</td>
</tr>
<tr>
<td>Hydratation%</td>
<td>76.3</td>
<td>78.8</td>
</tr>
<tr>
<td>FM%</td>
<td>33.1</td>
<td>47.3</td>
</tr>
<tr>
<td>BCM%</td>
<td>47.6</td>
<td>52.5</td>
</tr>
<tr>
<td>ECW%</td>
<td>49.0</td>
<td>54.1</td>
</tr>
</tbody>
</table>
Out of these 17 patients we made repeated measures at 8 patients (3 male and 5 female) every 2-4 months. The males average results:

first measure - last measure
BMI: 37.8 - 36.4
Hydratation%: 76.2 - 76.5
FM%: 35.7 - 33.6
BCM%: 48.8 - 47.8
ECW%: 47.9 - 48.9

The womens average results:
BMI: 37.9 - 37.2
Hydratation %: 78.9 - 78.8
FM %: 45.9 - 44.9
BCM %: 43.3 - 44.3
ECW %: 53.2 - 52.3

Conclusions: The conclusion of our result we could sum it up, that the body composition measuring is suitable for the valuation of weight reducing, in the other hand the method is also suitable for monitoring of rosiglitazon therapy.

RELATION BETWEEN THE CHILDHOOD OBSTRUCTIVE SLEEP APNEA SYNDROME AND THE OBESITY

P. Benedek, Z. Boglar, A. Czinner, G. Katona
Heim Pal Children’s Hospital, Budapest

Objective: The aim of the study to evaluate the relation between the obstructive sleep apnea syndrome (OSAS) and the obesity in childhood.

Design: Retrospective analysis of 50 patients in the sleep laboratory of Heim Pal Children’s Hospital, Budapest.

Patients: 35 were non obese and 15 were obese of them (28 boys, 22 girls, 9 boys and 6 girls were obese. 20 boys and 15 girls were non obese) The mean age: 8.5 year, the mean BMI: 38.5

BF>35

Methods: After a thorough anamnesis every patients underwent an ENT examination included laryngofiberoscopy a blood test, a multifrequency bioimpedancy measurement and a polysomnographic study has been done finally. The parents completed a questionnaire.

Results: The count of the AHI (apnea-hypapnea index) and the desaturation have been higher in the group of the obese patients than the non obese children in the same age during the polysomnographic study. (Non obese AHI: 6, obese AHI: 8). every patients were operated with adenotonsillectomy. It was curative in 44 cases, and the severity of the OSAS was decreased in 6 obese cases. In our study there was not necessary to use positive airway pressure therapy. The loss of weight and the ENT treatment have solved the problem in every case.

Conclusion: The obesity dose not play a main role in the cause of the OSAS, nevertheless this is an important component for the severity of the syndrome and the efficacy of the therapy. The appearance of the OSAS is more sever in the cases with obesity than the others. The efficacy of the therapy is less without the treatment of the overweight.

Every children with complain of the obesity should be asked about sleep problems because the treatment of the obesity is less effective without the therapy of the OSAS due to somatic and psychological (lack of sleep, depression) components.
Objective: The aim of the study was to compare the results of 3 various body fat estimates. The subjects were non-athletic university students (n=335), with a wide range of body mass (ranging between 41.8 and 129 kg).

Methods: Weight-related body fat content was estimated by InBody720 equipment, and by skinfold thicknesses according to the suggestions of Parízková (1961) and Siri (1956). The required skinfolds were recorded by Lange calliper. Differences between the estimated fat means were tested by one-way ANOVA, and the relationships were tested by linear correlation analysis and also by the Bland-Altman procedure.

Results: The equation of Siri resulted in the highest mean body fat content (28.7±7.3%) and the InBody720 equipment resulted in the lowest (22.7±7.3%) depot fat proportion. By using the table of Parízková for the estimation the mean relative body fat content was 24.2% (± 6.1). In spite of the significant mean differences the closest correlation was found between the two skinfold estimates (r=0.96). The relationship between the InBody720 and Parízková estimations can be described by 0.95 coefficient. The InBody720-Siri pairing resulted in 0.91 coefficient and by the Bland-Altman procedure no significant difference was found between the InBody720 and Parízková estimations.

Conclusions: The most marked individual differences were characteristic in the greater than 30% fat content range. The InBody720-Siri and Parízková-Siri comparisons were significantly different at 5% level of random error.
CENTRAL EUROPEAN CONGRESS ON OBESITY: FROM NUTRITION TO METABOLIC SYNDROME

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