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UNMODERATED (DISPLAYED) E-POSTER PRESENTATIONS

100. The different effect of angiotensin 1–7 receptor agonist (AVE 0991) administration on the local renin-angiotensin system of metabolically active tissues in obese Zucker rats

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Local renin-angiotensin system (RAS) in metabolically active tissues, including skeletal muscle and adipose tissue is of physiological relevance. Angiotesin 1–7 (Ang 1–7) is able to enhance insulin signalling and glucose transport activity in both tissues. The major limitation of exogenous administration of Ang 1–7 is that it is a peptide with very short biological half-life and low oral bioavaibality. AVE0991, a non-peptide Mas-receptor agonist, has been reported to mimic the action of Ang 1–7. The aim of our study was to evaluate the effect of AVE0991 application on the metabolic parameters, the expression of the RAS components and markers of oxidative stress such as NADPH oxidase 4 (NOX4), p22phox, superoxid dismutases (SOD) and nitric oxide synthases (NOS) in the skeletal muscle and adipose tissue of rat model of obesity. 33-week-old male obese Zucker rats were treated with vehicle (30 % solution of cyclodextrin) and AVE0991 (0.5 mg/kg BW/day in 30 % solution of cyclodextrin) via osmotic minipumps for two weeks. Gene expressions were determined in musculus quadriceps and epididymal adipose tissue using qPCR analysis. Administration of AVE0991 significantly improved glucose tolerance. In the epididymal adipose tissue AVE0991 treatment significantly down-regulated the expression of angiotensin-converting enzyme (ACE). The decrease in angiotensin II producing enzyme of RAS was accompanied by decreased NOX4 as well as eNOS and SOD2 expression with antioxidant properties, establishing a new oxidative-antioxidant balance on a lower level. In the skeletal muscle AVE0991 application significantly enhanced the expression of renin receptor, transcription factor PLZF and NOX4, and tended to increase the expression of p22phox. It has been shown that reactive oxygen species (ROS) have insulin-mimetic action in muscle. Our data indicate that the improved glucose tolerance after AVE0991 treatment might occur due to increased ROS production in the skeletal muscle. On the other hand, the antioxidant mechanisms are enhanced as well by elevated expression of nNOS and SOD1. In contrast to skeletal muscle with high oxidative capacity, adipose tissue is characterized by a far lesser oxidative capacity which is in accordance with presented data on NOX4, eNOS and SOD2. Our results suggest that AVE0991 improves insulin action by different mechanisms in skeletal muscle and adipose tissue.

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101. The effect of high-energy diet on Zucker diabetic fatty rats

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Type 2 diabetes (T2D) is a metabolic disorder characteristic with high blood glucose level due to insulin resistance and insulin deficiency. T2D is closely associated with obesity. Frequently used model of obesity are Zucker diabetic fatty (ZDF) rats showing glucose intolerance, hyperglycaemia, hyperlipidemia and hyperinsulinemia and polyuria. The goal of this study was to determine the effect of chronic high-energy diet feeding on development of diabetes mellitus complications associated with obesity in ZDF rats. Male ZDF rats (a fatty *fa/fa* mutation (-/-); n = 20) and their lean controls (ZL, non-diabetic, +/-, not display expression of *fa* phenotype, n = 10) of the same strain in the age of 3 months were involved in the experiment. All animals were housed under specific conditions at 23 ± 2 °C and 55 ± 10 % relative humidity with a 12 h light-dark cycle, provided with water and diet on *ad libitum* base. The

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rats were divided into three groups (n = 10 each) as follows: lean untreated controls (C) and obese rats (E1), both fed by normal chow with 5 % of oils and fats (KKZ-P/M, Dobra Voda, Slovak Republic), and obese rats (E2) fed by modified high energy diet where the number of joules increased substantially (30 % saturated fatty acids, 5 % polysaccharides and 15 % disaccharides). After overnight fasting rats were checked for blood glucose level by a FreeStyle Optium Neo Glucose and Ketone Monitoring System (Abbott Diabetes Care Ltd., UK) using test stripes (FreeStyle, Abbott Diabetes Care Ltd., UK) once a week. During the experimental period there were two spontaneous deaths in E2 group (n = 2, 20 %) 7 weeks after starting modified diet application. Since that the high energy diet was replaced by normal chow in order to prevent further death cases in this group of animals. Analysis of food intake showed the presence of hyperphagia mainly in E1 group. Modified diet caused significantly lower ($P < 0.05$) food intake. Probably the lower content of high-energy diet was able to induce the feeling of satiety quicker and to influence the amount of food consumed. Water requirement was significantly higher in E2 group (modified diet) in comparison to the lean controls and E1 group during the 6 weeks of the experiment. After 6th week of the experiment the water requirement in E1 group started to rapidly increase and in 8th week of experiment was higher than in E2 group. The high energy diet caused rapid increase in water intake and polyuria was higher in rats of E2 group compared with other groups. Modified diet, despite lower intake, caused massive increase ($P < 0.05$) in blood glucose level in comparison to the control and E1 group and earlier manifestation of diabetes complication accompanying with glucose impairment. In our experiment male ZDF rats developed obesity, hyperglycaemia, non-insulin dependent diabetes. Non-diabetic male ZDF lean controls were without any complications. High-energy diet accelerates the symptoms of diabetes mellitus in rat's model for T2D despite of lower absolute food intake.

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102. Administration of peroxisome proliferator-activator receptor alpha (PPAR-alpha) agonist reduces body weight and adipose depots in fructose fed wistar rats

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Aims: To investigate the effect of fenofibrate (PPAR-alpha agonist), on body weight, adipose depots and metabolic parameters in an experimental model of the metabolic syndrome. **Methods:** Metabolic syndrome was induced in 32 male Wistar rats by adding a fructose in drinking water (10 % solution) for 12 weeks. During the last 4 weeks, 16 rats were treated with fenofibrate (100 mg/kg/day) by intragastric tube, while the remaining 16 did not receive any medication (fructose group). Another control group of 16 rats consumed standard rat chow and water for 12 weeks. **Results:** Chronic fructose administration for 12 weeks induced a significant increase in body weight ($p < 0.05$), as well as the weight of the measured fat pads: perirenal ($p < 0.001$) and epididymal pads ($p < 0.001$) as representatives of the visceral adipose depots and the inguinal pads ($p < 0.05$) as a representative of the subcutaneous adipose depots. This was accompanied with a decrease of the subcutaneous/visceral fat ratio. Additionally, serum triglycerides, free fatty acids, insulin, plasma glucose were increased, whereas the serum HDL concentrations were decreased compared to the control group ($p < 0.001$ for all parameters). Treatment with fenofibrate over the final 4 weeks significantly decreased the body weight ($p < 0.001$). This was accompanied by a significant proportional reduction of the epididymal, perirenal and inguinal fat pads ($p < 0.001$ for all parameters), without changes of the subcutaneous/visceral fat ratio. Treatment with this PPAR-alpha agonist reduced serum triglycerides ($p < 0.001$), free fatty acids ($p < 0.001$) and increased HDL ($p < 0.01$) compared with the fructose group. Although the fasting plasma glucose values remained unchanged ($p > 0.05$), fenofibrate improved the insulin sensitivity, as assessed by a decrease of the serum insulin concentration ($p < 0.05$) and a reduction of the HOMA (Homeostasis Model Assessment) index of insulin resistance ($p < 0.01$) compared with the fructose group. **Conclusion:** This study indicates that, beside its well established lipid lowering effects, treatment with the PPAR-alpha agonist fenofibrate also decreases body weight and reduces the fat depots in an animal nutritive model of the metabolic syndrome.

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103. Feeding and metabolism altering attributes of the glucose-monitoring neurons in the cingulate cortex of the rat

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Purpose: We aimed to determine the consequences of selective destruction of the glucose-monitoring (GM) neurons in the cingulate cortex (cctx). In the previous experiments, our research group has identified and localized these cells in the cingulate cortex of the rat and during neurochemical characterisation of the neurons they proved to be influenced by catecholamines already known to participate in feeding-associated learning, and memory mechanisms. The (primary) aim of the present study was to further examine the involvement of these chemosensory neural cells in the organization of feeding and metabolism related regulatory processes. **Subjects and materials:** In adult male Wistar rats, after bilateral microinjection of streptozotocin (STZ) into the cctx, 1) acute (20 min) and subacute (2 weeks) glucose tolerance tests (GTTs) were performed; 2) plasma metabolite (total cholesterol, HDL, LDH, triglycerides, uric acid) concentrations before and during GTT were determined; and 3) taste perception capabilities of the animals were tested by means of taste reactivity, 4) conditioned taste avoidance and 5) two-bottle tests. **Outcome measures:** The dynamics of the blood glucose curves of control and streptozotocin treated rats during GTT has proved to be substantially different, in addition, the plasma metabolite levels in the two groups also showed differences. In a parallel series of experiments, the unpleasant tastes elicited more ingestive responses after the GM neuron destroying STZ microinjection, and the observable perception deficit in simple two bottle tests further substantiated the existence of gustatory disturbances of these animals. Nevertheless, it is important to note that conditioned taste avoidance could be established in all animals. **Conclusions:** Our findings suggest definite involvement of GM neurons of the cctx in adaptive regulatory mechanisms of the maintenance of homeostasis. Selective destruction of these chemosensory neurons appears to cause various symptoms of metabolic, gustatory and motivational alterations, thus, indicating finer and probably more complex dysfunctions of the regulatory processes in the background, than it has been suggested in previous experiments.

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104. Metabolic alterations after interleukin–1β microinjection into the cingulate cortex of the rat

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Broadening our knowledge about the central regulation of feeding and metabolism is indispensable in order to understand the background of feeding-related diseases, such as obesity, diabetes mellitus, metabolic syndrome, etc. The aim of the present series of experiments was to examine the metabolic effects of the primary cytokine interleukin-1β (IL-1β) after its administration into the cingulate cortex of male Wistar rats. The cingulate cortex, as part of the forebrain limbic circuitry, is known to have important role in the maintenance of homeostasis. Beyond that, the receptors of IL-1β have been detected in this area, and the existence of IL-1β responsive neural cells has also been revealed here during extracellular single neuron recording experiments of our laboratory. The cytokine was microinjected bilaterally by means of a microinfusion pump, via guide cannulas implanted above the target area during a stereotaxic operation one week earlier. The measurements were performed after a 12 hour fasting period, 20 minutes following the microinjections. Blood glucose levels of the animals were examined in a glucose tolerance test (GTT). Blood samples were obtained from the tail vein of the rats right before the cerebral micrionjections and 9, 18, 30, 60 and 120 minutes after the intraperitoneal glucose load. The plasma levels of total cholesterol, HDL, LDH, triglycerides and uric acid were measured with a cold chemistry photometer. Blood glucose concentrations of the cytokine treated animals were found to be higher compared to the controls throughout the GTT, but the differences did not reach the level of significance. In contrast, a significant decrease in the plasma concentrations of HDL and

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total cholesterol were measured compared to the control rats. There was no significant alteration in the concentrations of LDL, triglyceride and uric acid levels. Our results provided evidence for the existence of local IL-1β mediated control mechanisms of the lipid metabolism, and further emphasize the intimate involvement of the cingulate cortex in these complex regulatory processes of the maintenance of homeostasis.

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105. The use of newly discovered myokine irisin as a biomarker for individualised recommendation for physical exercise in obese individuals

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Obesity is one of the most important public health problems of the 21st century, due to its increasing prevalence and causal relationship with non-communicable chronic diseases. In the absence of efficient medical treatment, people with excess weight are advised to follow a low calorie diet and do regular exercise, with only modest results on weight loss and hence poor adherence. However, increasing physical exercise has numerous beneficial effects even in the absence of significant weight loss, among which cardiovascular and metabolic, which is why it is viewed as an indispensable part of the treatment for obesity. The recommendation for physical exercise in individuals with excess weight should be specific and based on quantifiable factors. High-intensity interval training (HIIT) appears to have more beneficial results on cardio-vascular fitness and metabolic parameters than moderate intensity continuous training (MICT), but there are no such studies in people with excess weight. Recently, the focus has been on the muscle as an endocrine organ during physical exercise. A newly discovered myokine called irisin appears to determine the browning of white adipose tissue with all the beneficial results. Irisin increases during physical exercise, dependent on intensity and duration, but data comes only from animal models and a few small studies in humans. We conducted a narrative review of published data aiming to determine whether irisin could be used as a biomarker of the efficiency of physical exercise and discriminate between the efficiency of HIIT vs. MICT. We found that although irisin is a suitable biomarker for assessing physical exercise, data is controversial regarding what type of physical exercise leads to a more significant increase in irisin in obese individuals. Currently, we are undergoing a case-control study to determine the type of physical exercise that leads to the maximum increase in irisin in men with excess weight, HIIT or MICT, in comparison to normal weight men. The study includes 40 healthy young men with excess weight and 20 normal weight controls that undergo single boosts of both types of physical exercise (HIIT and MICT) and circulating levels of irisin in dynamic are being assessed, along with complex anthropometric and metabolic parameters. To our knowledge, it is the first study of this type and magnitude, and the results will be important for more specific recommendation for physical exercise in people with excess weight.

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106. Association between biomarkers of adipose-tissue inflammation and immune response: A meta-analysis

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Background: Obesity-induced inflammation potentially promotes a variety of chronic conditions and diseases. Immunometabolism has emerged as a new field of research that investigates the interplay between immunological and metabolic processes in human organism. As a result of booming research interst on this topic over the last years, a large number of biomarker studies on adipose-tissue derived hormones and immune-inflammatory biomarkers has been published. However, no quantitative evaluation of reported associations between biomarkers of immunity and metabolism was previously performed. **Methods:** We aimed to systematically evaluate population-based studies reporting on the associations between adipose-tissue derived hormones [leptin and adiponectin] and inflammatory biomarkers [C-reactive protein (CRP), interleukin (IL)-6 and tumor necrosis factor (TNF)-α]. In addition, we assessed the influence of age, sex and adiposity status on these associations. We conducted a systematic search of the databases EMBASE and MEDLINE (PubMed) up to January, 2017. Peer-reviewed cross-sectional

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studies were included reporting on correlation coefficients between evaluated biomarkers. Studies with participants younger than 18 years and conducted in terminally ill participants and pregnant women were excluded. Data was independently extracted by two reviewers. Pooled effect sizes and 95 % confidence intervals were calculated using random-effects models considering variations among the studies. Quality of the studies was assessed using BioCross evaluation tool developed for biomarker-based cross-sectional study evaluation. Results: After initial search 5,907 publications were retrieved and from these 314 articles were retained for a full-text review. After evaluation for eligibility, overall 60 studies and a total number of 45,210 participants aged on average 50 years were included in the meta-analysis. Positive correlations were observed for leptin with the inflammatory biomarkers (Pooled R_{ho} = 0.35, 0.17 and 0.16 for CRP, Il6 and TNFα, respectively), whereas the respective correlations with adiponectin were negative (Pooled R_{ho} = -0.17, -0.14, and -0.14 for CRP, Il6 and TNFα, respectively). Stratification by age showed that the correlations among biomarkers tended to be weaker with increasing age of the study participants, particulaly for adiponectin. When analyzed according to adiposity status, stronger correlations were observed for leptin with CRP and IL-6 in obese participants, whereas no differences were observed for the correlations with adiponectin. No substantial differences were observed by participants' sex. Conclusion: This is the first quantitative synthesis of human studies using measured biomarkers to evaluate the interplay between metabolic and immune-inflammatory pathways. Importantly, the data revealed potential influences by older age of participants that require further evaluation. Interdisciplinary research for a better understanding of the obesity and inflammation links predisposing disease onset with advanced age is highly warranted in the future.

107. Assessment of the resting energy expenditure in obese individuals

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Introduction: Weight loss programs are based on inducing a negative energy balance by decreasing energy intake while increasing energy expenditure. Energy needs of obese patients are difficult to determine. The value of resting energy expenditure, as the largest component of the energy needs, is usually calculated to asses an adequate energy intake for obese patient. In clinical practice, predictive equations are most commonly used for this purpose, because of their simplicity, although many clinical studies have shown that in obese individuals they may generate errors large enough to impact the outcome of treatment. It leads to the prescription of an inadequate diet that does not meet the criterion of long-term sustainability. **Objective:** The aim of the thesis is to compare the values of resting energy expenditure (REE) measured by indirect calorimetry with values calculated with Harris-Benedict predictive equation in a selected group of obese individuals. **Methods:** The sample includes 38 subjects, 28 women and 10 men, patients of the General University Hospital in Prague. The average age is 48 ± 11.71 years, the mean BMI is 42.88 ± 9.09 kg/m^2. For each subject, resting energy expenditure was measured by indirect calorimetry and calculated by the Harris-Benedict predictive equation. Indirect calorimetry is considered as a reference method. The values of measured and calculated REE were statistically evaluated. Paired t-test on the mean value was selected for the statistical significance testing. **Results:** The mean value of REE obtained by calculation according to the Harris-Benedict equation is 8,462 ± 1,919 kJ/day. The mean value of REE measured by indirect calorimetry is 8,006 ± 1,675 kJ/day. The average absolute deviation value of calculated REE in comparison to the measured values is 456 ± 1,325 kJ, the average percentage deviation is 7 ± 17 %. The REE values calculated according to the Harris-Benedict equation obtained in comparison to the values measured by the indirect calorimetry REE ± 10 % variation in only 48 % of cases (n = 18). Based on the 5 % significance level, there is a significant difference between the results of the method of indirect calorimetry and the predictive equation Harris-Benedict. **Conclusion:** The calculations of REE with the Harris-Benedict predictive equation show statistically significant differences in comparison to the actual values measured by indirect calorimetry. Using predictive equation gives inaccurate results for obese. Indirect calorimetry, while maintaining correct measurement conditions, is considered the most accurate method available, but cannot be used across the board in all patients within a weight management plan. The optimal approach thus appears to be to calculate energy intake from patient´s current food records.

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108. Linking Adaptive Response to Regular Exercise in Muscle and Brain

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Introduction: Muscle function and morphology are closely related to regular exercise and nutritional preferences. Exercise is known to improve cognitive functions and modulate nutritional preference. **Goals:** To investigate relationships between exercise induced-effects on (i) muscle functional and morphological parameters and (ii) dietary preference in individuals subjected to 3-month supervised exercise intervention. (iii) Interactions with exercise-induced changes in cognitive functions were investigated in a subgroup of elderly individuals with mild cognitive impairment (MCI). **Methods:** Study population consisted of 80 non-obese (BMI 28.9 ± 0.5 kg/m^2) upper-middle aged (56.4 ± 1.9 yrs.) individuals and10 individuals with MCI (26.0 ± 0.7 kg/m^2; 71.3 ± 1.6 yrs). Hand-grip and leg-press dynamometry were used to evaluate exercise-induced changes in muscle strength. Muscle cryosections (6 mm) were examined by histomorphometry and histochemistry (ATPase activity). Food preference for individual micronutrients was calculated using food preference questionnaire and food composition databases (FDA, ALIMENTA). Samples of *m. vastus lateralis* were taken by Bergstrom needle biopsy. Cognitive functions were assessed by standardized cognitive tests. **Results:** Handgrip strength was positively associated with lean body mass (LBM) and negatively with fat mass (R = 0.76/-0.62, p < 0.001). Size of fast oxidative (Type IIa) fibers was positively associated with handgrip strength (R = 0.56, p < 0.001) and with LBM (R = 0.35, p < 0.045). Exercise-induced change in type IIa fiber size positively correlated with BMI and body fat and negatively with LBM (R = 0.57/0.64/-0.63, p < 0.023/0.006/0.008). Slow twitch to fast-twitch fiber ratio was negatively associated with exercise-induced improvements of short-term visual memory (MemTrax) in MCI individuals (R = -0.81, p < 0.001). There was a positive correlation between exercise-induced changes in visual memory, slow to fast fiber ratio and type IIa fiber size (R = 0.64/0.61, p < 0.045). Dietary preference for food containing arachidic (C20:0) and behenic (C22:0) acid (e.g. fish & vegetable oils) was positively related to type IIa fiber size (R = 0.56/0.62, p < 0.05/0.025) and muscle strength (hand-grip & leg press) (C20:0, R = 0.6/0.56, p < 0.0005/0.031, C22:0, R = 0.63/0.56, p < 0.0001/0.032) and negatively to short term visual memory (C20:0, R = -0.53/-0.51, C22:0, R = -0.53/-0.51, p < 0.03). **Concussion:** In our study, muscle strength was related to size of fast oxidative IIa fibers and to dietary preference for fish and vegetable oils containing long chain saturated fatty acids. Exercise-induced change in visual memory was greater in MCI individuals whose muscle contained more IIa fibers, which readily increased in size in response to exercise.

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109. Fat makes adolescents feel tired

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Introduction: Puberty can be disrupted by various factors such as unhealthy behaviors, malnutrition but also obesity. Being physically active, at least 60 minutes a day, and decrease recreational screen time to no more than 2 hours a day is recommended. Beside these physiological concerns, more attention is given to the psychological aspect. Fatigue is already identified in chronic conditions such as obesity but is also a growing problem in school attending adolescents (< 25 %). This study tried to link body composition parameters with (self-perceived) fatigue and physical activity/performance. Further, relations between (self-perceived) fatigue and physical activity were examined and finally predictors for (self-perceived) fatigue were determined. **Methodology:** A total of 452 high school pupils (12–20 years) were recruited with a 66/34 boy/girl ratio. Pupils were measured for body length, weight and body composition (Fat mass, fat percentage, fat free mass and muscle mass). Additionally, physical activity (Baeke questionnaire), physical performance (grip strength, fatigue resistance, grip work and Cooper test) and self-perceived fatigue (MFI-20) were assessed. The population was divided into 3 groups namely Low Fatigue (LF), Medium Fatigue

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(MF) and High Fatigue (HF), based on Total Fatigue outcomes. **Results:** No significant differences were found for age, weight and BMI between the 3 fatigue groups (LF, MF and HF). Fat mass and fat % were significantly lower in the LF group compared to MF ($p < 0.05$) and HF ($p < 0.01$). Grip endurance was increased in LF ($p < 0.05$) and MF ($p < 0.01$) compared to HF, similar results were found for Cooper test. Grip strength, on the other hand were comparable, between the groups. Sport Index was higher in LF compared to MF and HF ($p < 0.01$). Fat and physical activity were related with self-perceived fatigue ($p < 0.01$). Finally results showed that decreased Fatigue Resistance, Sport Index and a higher fat % increased the chance of being extremely fatigued. **Conclusion:** An Increased sense of fatigue appears in adolescents with higher fat percentage, reduced physical performance and decreased physical activity. This study emphasises the importance of using fat mass and fat percentage instead of BMI for screening adolescents to determine their health status. To prevent increased fatigue, it is necessary to stimulate youngsters to be physically active and to promote healthy behaviours.

110. Super obesity and bariatric surgery – is the gastric balloon always useful?

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Background: A male, 35-year-old patient was presented in June 2014 in our obesity consultation with the question of a bariatric surgical intervention (BCI). For a body size of 1.97 m, the body weight was 275 kg, which corresponded to a BMI of 71 kg/m^2. There was a marked metabolic syndrome with diabetes mellitus type II, arterial hypertension and sleep apnea syndrome, orthopedic attendant diseases and a global heart failure with recurrent decompensations. Multiple hospitalizations were necessary due to cardiac insufficiency. For a given primary indication for BCI, a preoperative weight reduction for the reduction of the operative risk should be achieved by means of application of a gastric balloon (GB) prior to laparoscopic sleeve resection. **Case history:** The GB application (Obera/Allergan) took place in December 2014. The GB was filled with 700 ml of NaCl solution which were colored blue with indigocarmin in order to be able to detect a possible leakage or rupture of the GB due to a coloration of the urine. The patient was closely checked by the team of our obesity center and was intensively accompanied by a trophologist. Following an initial success and a temporary weight loss of approximately 30 kg, there was a weight regain, which could not be stopped, despite an extended duration of therapy with the GB up to 8 months. Relevant side effects of the GB (vomiting, GI bleeding and aspirations) did not occur. Finally, the GB was removed in August 2015. At 257 kg, the weight was only 18 kg below the initial weight. Cardiac insufficiency therapy has become increasingly difficult. The Patient had several hospitalizations during he had the GB, mostly because of hyperhydration. Finally, laparoscopic sleeve resection with a body weight of 258 kg was performed in October 2015 without complications. A few days after the procedure, an increased spontaneous diuresis was observed. By May 2017, a weight reduction of 134 kg could be achieved. The antihypertensive agent could be discontinued, the diuretic dose significantly reduced. **Conclusion:** The presented course shows that an urgently indicated BCI can also be delayed by a GB application. The patient would have been operable on ex post, even with 275 kg, which is an argument for an always critical indication GB, especially due to the fact that severe complications might be associates to GB in super obese patients. Moreover, the case also shows that even super obese patients with cardiac insufficiency can be successfully treated by BCI.

111. Gastric perforation, a rare complication of gastric balloon (Case report)

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The BioEnterics intragastric balloon (BIB) is one of the most common bariatric procedures in obese patients in Egypt and middleeast. There are many complications related to it, one of rare and life-threatening complications is gastric perforation. We report a case of such complication 4 months after BioEnterics intragastric balloon insertion in a 27 years old male patient. The patient came to emergency department; he was ill and toxic with sever agonizing pain since two days. By examination there was marked guarding all over the abdomen (surgical abdomen) plain Xray revealed air under diaphragm, moderate peritoneal collection by ultra sonography. Laparotomy was done which revealed anterior gastric wall perforation.

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112. Food habits and nutritional status in Hungarian young people

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The Health Behaviour in School-Aged Children (HBSC) study is a World Health Organization (WHO) collaborative cross-national data collection, in which Hungary has taken part for more than three decades. The aim of the HBSC study, besides monitoring different trends, is to get information about young people's health- and risk-behaviour. In 2014, when the latest data collection was carried out, 6,153 11–18-year-old students were involved in the nationally representative sample. This study presents the food habits: frequency of fruit, vegetable, sweets and non-diet soft drink consumption, and the nutritional status of the youth based on the last HBSC survey. Data were collected in school-settings by the use of voluntarily self-reported, anonymous questionnaires, and with the approval of the Hungarian National Ethical Authority. Descriptive statistics were computed, sex and age differences were tested by bivariate analyses (Chi-square tests, t-tests, and ANOVAs). In the whole sample 32.6 % of the students consumed fruits and 30.4 % consumed vegetables daily. One-third of the students reported daily sweets consumption and 26.3 % consumed soft drinks daily. Generally, girls consumed fruits and vegetables more frequently than boys; and the frequency of consumption declined with age in both genders. The sweets and soft drinks consumption frequency also decreased with age and the sweets consumption was more typical in girls but the soft drink consumption frequency was higher in boys. According to the reported BMI based nutritional status, less than 3 % of the youth were obese, a bit more than 12 % were overweight, 70 % had normal weight and 15 % were underweight. Hungarian students' percentages in daily fruit and vegetable consumption were close to the international average, but the sweets and soft drinks consumption was higher. Generally, the fruit and especially vegetable consumption in Hungary increased between 2010 and 2014. Young people's prevalence in different nutritional groups have not changed comparing the last two data collections; however, the ratio of obese and underweight students is still high. Despite the positive changes documented in this study, the majority of the young people are far from meeting the international dietary recommendations.

113. Evaluation of nutrition-related risk factors among the Hungarian adult population

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Nutrition related diseases are the leading causes of morbidity and mortality in Hungary. In order to improve the health of the population it is essential to assess the nutrition-related risk factors and to reduce their prevalence by targeted interventions. Nationally representative nutritional surveys reveal the nutritional risks among the population. In this current study the evaluation of the main nutrition-related risk factors (excessive fat, saturated fat, sugar and salt intake, low vegetable and fruit consumption) is presented through the results of three major nutritional surveys: The First Hungarian representative nutrition survey (1985–1988), the Hungarian Diet and Nutritional Status Survey 2009 (OTAP2009) and the Hungarian Diet and Nutritional Status Survey 2014 (OTAP2014). According to the data of the First Hungarian representative survey the fat intake of the Hungarian population was about 10 % higher than recommended and the intake of saturated fatty acids was nearly three times higher than the recommended maximum of 7 E %. In the OTAP2009 and OTAP2014 studies there was a decline in the population's fat intake compared to the first survey but at the same time the fat intake of women showed a significant increase between 2009 and 2014. Although the intake of saturated fatty acids has fallen since the first study the < 7 E % intake recommendation is exceeded by both men and women. The proportion of energy from saturated fatty acids from dietary intake in women has increased slightly but significantly by 2014 compared to the 2009 data. According to the results of the first study the intake of added sugar exceeded the recommended 10 E % but in the other studies the intake values met the recommendations. However, it should be highlighted that while in 2009 the proportion of energy from added sugar was below 10 E % in all ages, in 2014 the intake of added sugar in young women exceeded the recommended level. The salt intake of men was extremely high at the time of the first study and although it has fallen by 25 % by 2014, it is still three times higher than recommended. The salt intake of women has also declined but it still exceeds the recommended level. The fruit/vegetable consumption increased between 1985 and 2009, but a declining tendency can be observed between 2009 and 2014. According to the surveys conducted between 1985 and 2014 the fat, saturated fatty acid, added sugar and salt intake fell in Hungary, however, with the exception of sugar intake, each value still exceeds the recommended level. It is important to follow the nutrition and the nutritional status of the population in the future as well so that targeted interventions can be implemented.

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114. Which foods are deficient in the diet of patients with type 2 diabetes?

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Introduction: Education is the most time-consuming part of the treatment of DM. **Objective:** The aim of this work is to emphasize the importance of regular consumption of nuts, dairy products rich in omega-3 fatty acids and the daily consumption of vegetables and fruit several times a day. **Patients and methods:** We were comprehensively educated 200 outpatients (117 men and 83 women, aged from 30 to 92 years) with newly diagnosed and previously untreated diabetes mellitus type 2 during the period of 8/2007–8/2011. In order to determine the quality of education and compliance after 18 months we have compiled a questionnaire containing 63 questions that followed the lifestyle measures: physical activity, shift work, sleep, passing diet in the past, alcohol consumption, smoking and drinking regime and a qualitative changes in the diet: meal frequency directly, the frequency of fruits and vegetable consumption, consumption of: nuts, fish, white and dark meat, legumes, thermal technologies in food processing, intake of unhealthy fat and simple carbohydrates, frequency of consumption of: bacon, greaves, liver, sausages and sausage, chocolate, cookies, instant meals, soft drinks, eggs, dairy products, sweetening and salting. 142 patients (74 men and 67 women), women age: 44 to 86 years (median 65 years), male age: 37 to 92 years (median 64 years) have agreed for filling out the questionnaire. **Results:** Our data suggest that 29.87 % of women and 24.32 % of men in our study consumed tree nuts times a week. 10.45 % of women and 9.46 % of men consumed tree nuts five times a week. 28.36 % of women and 24.32 % of men in our study consumed 5 times a week dairy products and 28.4 % of women and 37.8 % of men consumed 3 or 4 times a week dairy products. Only 74.63 % of women and 50 % of men in our study consumed every day of the week fruit and only 31.34 % women and 16.22 % of men consumed every day of the week vegetables. **Conclusion:** According to the Statistical Office of the Slovak Republic is a low consumption of nuts, milk products, vegetables and fruit per capita per year in comparison with consumption in other countries with lower cardiovascular and oncological mortality. In the present days, more scientific evidence is available that supports the recommendation of Mediterranean diet is applicable therapeutic strategy for decrease the risk of oncological and cardiovascular disease associated with metabolic syndrome and type 2 diabetes. We present recommendations that support use of this specific diet in daily praxis. The implication of Mediterranean diet is based on no radical nor extensive intervention in dietary habits, in rather represents an offer of wider variety of healthier types of food.

115. The dietary habits of the Hungarian adult population – Hungarian diet and nutritional status survey (OTAP 2014)

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The mortality and morbidity rates of the Hungarian population show a negative picture compared to other European countries. One key measure to prevent chronic diseases is the promotion of healthy eating. The aim of the analysis is to demonstrate how the dietary habits of Hungarian adults comply with the key elements of dietary recommendations (e.g. quantity and quality requirements for the consumption of fruits and vegetables, whole grain, milk and milk products, as well as the reduction of salt intake). The Hungarian Diet and Nutritional Status Survey 2014 included the completion of three-day dietary records followed by a multistage validation process. The three-day dietary records provided information on the energy and nutrient intake values, the number of daily meals consumed, the eating rhythm of the population, and the type and quantity of foods most frequently consumed over a given period. According to the dietary records, 72 % of adults do not consume whole grain based food at all. Two thirds of the Hungarian population consume less fruits and vegetables than recommended. It is a particularly unfavorable change that the consumption of fresh fruits and vegetables has fallen by almost a fifth compared to the previous survey in 2009. Instead of the recommended daily 0.5 l milk or equivalent calcium-containing dairy products, the population only consumes an amount of calcium equaling to 0.3 l of milk. Based on the results of the study it can be concluded that the dietary habits of the Hungarian population do not meet the recommendations. The information obtained from nutritional status surveys could promote the elaboration of effective recommendations, public health programs and legislative measures, which could help to reduce the prevalence of overweight and obesity currently affecting two thirds of the Hungarian population.

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116. Investigation on the existence of eating disorders and differences to eating habits, in students aged 15–18 years old in the city of Nafpaktos, in resting conditions and in exams period

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Aim: The aim of the study was to investigate the existence of eating disorders in a sample of adolescents and on the other hand the assessment and verification of the contribution of exams anxiety to possible changes in dietary habits or in the incidence of eating disorders, exploring a potential climax for both anxiety and eating behavior during national university entrance exams. **Material–method:** 120 students in High Schools of Nafpaktos participated in the study. Except for anthropometry, a wide range of specific questionnaires was used and completed on two separate occasions: a) during the control period (relax) and b) during the examination period (anxiety). Statistical analysis was performed using the statistical package SPSS 23. **Results:** 1.71 % met criteria for anorexia and 5.83 % for bulimia. 7.5 % had atypical anorexia symptomatology (1.66 % presents bulimic symptoms). 12.5 % was vulnerable to a future development of eating disorders symptoms. The 50.83 % likely reflected a subclinical group of bing-eaters. The average adherence to the Mediterranean diet was low in the resting phase and even lower in the anxiety period. Those who fed according to the Mediterranean Diet standards showed an increase during the anxiety period in potato and whole grain consumption, stagnation in consumption of olive oil, reduction in all other foods. The average adherence to the Mediterranean diet was low in the resting phase and even lower in the anxiety period. Those who fed according to the Mediterranean Diet standards showed an increase during the anxiety period in potato and whole grain consumption, stagnation in consumption of olive oil, reduction in all other foods. More stress and nutritional changes were found in the A, C class where there was a decline in the consumption of pulses, fish, and cereals during the exam period. Pupils of A' Class also were experienced a drop in full dairy consumption, while C' class' students increased poultry, meat and fruit consumption. Statistically significant differences were found between boys and girls in all food categories in the anxiety period, while in both sexes statistically significant differences in the two periods in consumption of fruits and juices, pulses, and red meat. Girls also show a statistical difference in the consumption of vegetables and salad and fish and soup while the boys in olive oil and alcoholic beverages: $p < 0.05$. Exams anxiety was negatively related to adherence to the Mediterranean diet, consumption of legumes ($p < 0.05$), red meat, poultry ($p < 0.01$) in the testing phase and positive correlation with the consumption of olive oil ($p < 0.01$). It is related to girls with all the scales of eating disorders, eating habits, feeding according to external stimuli, while in boys only with emotional nutrition. In girls it was correlated with all eating disorders scales and the subscales "Preoccupation with food" and "Dealing with diets", the subscale "nutrition under external stimuli" while in boys there was correlation only with "emotional eating" subscale. **Conclusions:** Urgent need for eating disorder prevention programs and management of exams anxiety in schools.

117. Association between lipoprotein(a) and fatty liver disease in nonalcoholic patients

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Background and aims: High levels of lipoprotein a [Lp(a)] have been associated with increased risk of cardiovascular disease, possibly through atherogenesis or through disruption of the fibrinolytic mechanism. The aim of this study is to investigate the effect of Lp(a) levels on the presence of fatty liver disease in nonalcoholic patients. **Methods:** The study included 223 participants, with a mean age of 71 ± 11 years that were hospitalized for minor illnesses in or visit for routine health screening examination the departments of internal medicine of three tertiary hospitals. None of the patients suffered from diabetes or had any medication for dyslipidemia. The study duration was 12 months. Patients were divided into two groups according to the levels of Lp(a) (normal-abnormal) The presence of the fatty liver disease was assessed to all patients by ultrasonography by two independent ultrasonography specialists. **Results:** Group A included 101 participants who had abnormal values of Lp(a), while in Group B were included 122 patients with normal Lp(a). In group A, 65 patients with fatty liver disease were recorded, while in Group B 57 patients had fatty liver disease. The difference between the two groups showed borderline statistical significance ($p = 0.055$). The statistical significance did not change after adjusted for other factors such as LDL, BMI, total

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cholesterol, triglyceride, presence of high blood pressure or fasting glucose. **Conclusions:** It seems that there is a possible correlation of abnormal levels of Lp(a) and the presence of fatty liver disease in nonalcoholic patients. Further studies with a larger population with greater statistical power are needed to confirm these findings and to clarify the possible pathogenetic mechanism.

118. Half-century trends of obesity development in Slovak population – dietetic possibilities of obesity correction and its complications

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Introduction: An extensive review of foreign literature confirms the epidemic increase in obesity prevalence, especially in populations of economically prosperous states. The number of overweight or obese young children globally increased from 31 million in year 1990 to 42 million in 2015 (WHO). It is important to find out if this aforementioned unfavorable world phenomenon also concerns the inhabitants of Slovakia. **Objective:** To present the results from the 50-year trends in the prevalence of obesity in the young generation and adults in the SR and its dynamics (1964–2014) and to point out the dietetic possibilities of obesity correction and its complications. **Characteristic of the study sample and methodology:** Different samples of representative studies from the population of children and adolescents, aged 7–18 y. (totally over 5,500 children and youngsters), and healthy adults, aged 19–75 y. (about 3,500 people), gender and age-proportioned population were used. **Dietetic tests:** Reduction diets 600 kcal (2,500 kJ)/24 hours, 4 weeks, 750 kcal (3,350 kJ)/24 hours, with the addition of 2.5 g of n-3 PUFA, three times a week for period of 6 weeks in proportional and obese individuals with hyperlipoproteinemia, in one group also with an impaired glucose tolerance for 4 weeks. Totally were involved 208 subjects, age in zone 36–49 years. Basic somatometric measurements were determined by standard methodical procedures. We have calculated the height-weight indexes BMI (kg/m^2). For children and youth we have used BMI percentile tables, differentiated by gender and age, developed from 1951, regularly updated at 10-years intervals, the last ones in 2011, from Nation-wide research of the young generation aged 7–18. The criteria for preobesity (overweight) was 90–96.99 percentile, for obesity 97 percentiles and above. Preobesity was classified as BMI 27.3–29.99 kg/m^2 for adult women and for men 27.8–29.99 kg/m^2, as obesity BMI over 30 kg/m^2 for both sexes. Serum lipid parameters were analyzed (total cholesterol-TC, LDL-C, HDL-C, triacylglycerols (TAG) using Johnson & Johnson's Vitros automated analyzer, there were calculated AI (TC/HDL-C), glycemic curve determined by standard laboratory procedure after 75 g of glucose p.o., glycemia by o-toluidine reaction and insulinemia, as an immunoreactive insulin (IRI) kit (NS-SET /DCC) from Poland. **Results:** Development of the obesity prevalence among young generation (girls and boys) aged 7–18 during the period 1964–2014 shows in 2 forms – preobesity and obesity: 9.4 %, vs. obesity rate 3.1 % in 1964, 11.3 %, vs. 5.1 % in 1984, 13.3 %, vs. 6.3 % in 2007 and 18.9 %, vs.8 % obesity in 2014. In adults (females and males) aged 19–75 years, preobesity and obesity: 20.1 %, vs. obesity 8.3 % in 1964, 25.3 %, vs. 11.7 % in 1984, respectively just obesity 18.8 % in 1995, 18.1 % in 2000 and 16.8 % in 2014 (OECD). Clinical tests: After reduction diet (600 kcal/24 h), lasted 4 weeks, weight reduction was 9.5 kg, $p < 0.01$, we recorded decrease in serum lipids parameters (mmol/l): TChol, $p < 0.001$, LDL-C $p < 0.01$, HDL-C $p < 0.05$ (adverse finding), TAG $p < 0.01$, AI was non-significant. After PUFA application n-3, 2.5 g/day, 3 times per week for 6 week in proportional individuals; significant reduction in TAG levels $p < 0.001$, TC and LDL-C $p < 0.01$, AI $p < 0,05$, the desired increase in HDL-C $p < 0.05$. After reduction diet 750 kcal + 2.5 g PUFA n-3, 3 × week: weight reduction was 10.6 kg, $p < 0.01$, significant reduction in TAGs, $p < 0.001$, TC and LDL-C, $p < 0.01$, also decrease in AI $p < 0.05$, no significant changings in HDL-C. Reduction diet 600 kcal/24 h, 4 weeks in obese women with hyperlipoproteinemia ($n = 47$), also with impaired glucose tolerance ($n = 37$), weight reduction was 9.7 kg, $p < 0.01$, TC, $p < 0.01$, LDL-C, TAG and AI $p < 0.05$, HDL-C, ns. glycemic curve before and after reduction – improvement in glucose tolerance, $p < 0.05$, insulinemia curve – significant reduction of basal insulinemia and whole curve, $p < 0.001$. **Conclusion:** Obesity amonginhabitants of the Slovak Republic does not show the conditions of the epidemic yet, but it is justified to apply complex procedures for its prevention, especially in the younger generation. A frequent finding of hypertriacylglycerolemia in 55 % of obese people is appropriate to correct by adding PUFA n-3 in their diet. Reduction diet (law caloric diet) in addition to achieving weight loss, also regulates hyperlipoproteinemia, improves glucose tolerance and reduces hyperinsulinemia.

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119. Consumer perspectives about weight management services in a community pharmacy setting in Albania

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Background: Obesity is a public health challenge faced worldwide. Community pharmacists may be well placed to manage Albania's obesity problem owing to their training, accessibility and trustworthiness. However, determining consumers' needs is vital to the development of any new services or the evaluation of existing services. **Objective:** To explore Albanian consumers' perspectives regarding weight management services in the community pharmacy setting, including their past experiences and willingness to pay for a specific pharmacy-based service. **Design:** An online cross-sectional consumer survey was distributed to participants regular customers of a community pharmacy in Lezhe, Albania. The survey instrument comprised open-ended and closed questions exploring consumers' experiences of and preferences for weight management services in pharmacy. It also included an attitudinal measure, the Consumer Attitude to Pharmacy Weight Management Services (CAPWMS) scale. **Setting and participants:** A total of 213 consumers from Lezhe, Albania completed the survey. **Results:** The majority of respondents had previously not sought a pharmacist's advice regarding weight management. Those who had previously consulted a pharmacist were more willing to pay for and support pharmacy-based services in the future. Most consumers considered pharmacists' motivations to provide advice related to gaining profit from selling a product and expressed concerns about the perceived conflicts of interest. Participants also perceived pharmacists as lacking expertise and time. **Conclusion:** Although Albanian consumers were willing to seek pharmacists' advice about weight management, they perceived several barriers to the provision of weight management services in community pharmacy. If barriers are addressed, community pharmacies could be a viable and accessible setting to manage obesity.

120. Effectiveness of cognitive behavioral therapy on changes of anthropometric and biochemical parameters in group weight reduction courses

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Introduction: Obesity is currently considered to be the most frequent metabolic disease worldwide, not only in developed but also in developing countries. Increasing prevalence of obesity could be call as epidemic of third millennium. STOB society evolved 12 weeks structured plan for weight reduction, which is apply in closed group. Group therapy is based on cognitive behavioral therapy. Aim of our work is monitoring effectiveness of this programme on anthropometric and biochemical changes and changes of eating and physical activity habits. **Methods:** Women which intended reduce their excess weight were enrolled. Design of study consists of first baseline measurement of nutritional state and control measurements after 12 weeks intervention. Nutritional state was evaluated by BMI, waist circumference, and bioelectrical impedance analysis. Muscle strength was evaluated using the hand grip test by digital strain gauge Geta. For evaluation of nutritional intake we used 7-day food record and analyzed by software Nutridan2. We collected a blood samples for biochemical examination (fasting glycemia, total cholesterol, HDL cholesterol, LDL cholesterol, triglycerides and uric acid). Physical activity was monitoring by accelerometer InBody band and number of steps by day. **Results:** Till now we enrolled 23 women with mean age 40.3 ± 13.3 years. BMI was changed from 34.0 ± 7.3 $kg.m^{-2}$ to 32.8 ± 7.3 $kg.m^{-2}$ ($p < 0.001$). Mean weight reduction was -3.7 ± 2.7 kg (in range +2 kg to -8.2 kg). Mean reduction of body fat was from 40.1 ± 14.8 % to 39 ± 15.9 % ($p = 0.001$). Waist circumference was reduced from 102.3 ± 15.1 cm to 97.5 ± 15.1 cm ($p < 0.001$). In nutritional intake we found reduction of energy intake from 7980 kJ to 7105 kJ per day and lipid intake from 75 to 60 grams per day. From biochemical parameters best result were in serum lipid reduction. Total cholesterol was lowered from 5.2 ± 0.9 to 4.8 ± 0.9 mmol/l ($p < 0.001$) and LDL cholesterol was lowered from 3.2 ± 0.9 to 3.0 ± 0.9 mmol/l ($p < 0.001$). **Conclusion:** Almost all women could reduce their weight. From body weight they reduced especially body fat, muscle mass remained the same. Every anthropometrical and biochemical parameters were improved. CBT is very effective methods for improving eating and physical activity habits. In our study we will continue and we will follow the weight maintenance and change of biochemical parameters after finishing the course.

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121. Determination of slimming effect by auricular acupuncture stimulation –statistical analysis of 1,017 female data

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We investigated the effects of auricular 1.5 mm small sphere particle stimulation on non-obese healthy volunteers and mildly obese patients. Subjects (n = 1,017) averaged 42.8 ± 12.26 years old, and BMI was 25.64 ± 3.75. Slimming by acupuncture stimulation existing in auricle is a treatment method with history of more than 20 years in Japan, but gold or ceramic particles are pasted on the acupuncture point of 6 points (Shin-mon MA-TF1 Ershenmen, stomach, esophagus MA-IC6 Shidao, cardia MA-IC7 Benmen, lung MA-IC1 Fei, endocrine MA-IC3 Neifenmi). This is done by applying stimulation twice a week. In this study, statistical study and correlation were analyzed as to whether this method could be effective against slimming. We have used Dual frequency body composition meter (TANITA DC-430A, Tokyo Japan) Body weight (63.64 kg ± 10.13 → 57.12 kg ± 9.00) BMI (25.64 ± 3.75 → 23.03 ± 3.48) Body fat ratio (36.80 % ± 5.59 → 31.73 % ± 6.10) Overall muscle mass 37.46 kg ± 3.93 → 36.37 kg ± 3.66) Waist (77.60 cm → 74.23) Basal metabolic rate (1,207.64 kcal ± 146.99 → 1,146.77 kcal ± 135.05), a significant decrease was seen. During the treatment period, exercise therapy was not used concurrently with dietary guidance only. When we looked at the correlation between each data, the amount of BMI at the start showed high correlation with body fat percentage and visceral fat level BMI obesity degree. Weight reduction effect was observed in non-obese and healthy adult subjects by "auricle acupuncture stimulation by particles". We propose a possible mechanism for the weight-reducing effects that the ear acupuncture stimulation may be a means of instructing weight loss after diet exercise therapy.