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73. Glucose metabolism, cognitive functions and physical (in)activity

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Introduction: Substantial evidence indicates that impaired glucose metabolism and sedentary lifestyle may accelerate cognitive decline, increasing the risk of Alzheimer's disease. Regular exercise represents an effective way of preventing both age-related metabolic and cognitive decline. **Objectives:** (i) to evaluate cognitive functions in seniors with prediabetes & amp; type 2 diabetes (T2D) and in controls with normal glucose tolerance (NGT); (ii) to evaluate associations of physical fitness and cognitive functions; (iii) to determine the effect of long-term aerobic-strength training on cognitive functions and metabolism. **Methods:** Study population (n = 52; 68.3 ± 7.9 yrs, M/F = 21/31) included patients with prediabetes & amp; T2D (n = 20). The level of physical activity was assessed by a validated questionnaire. Cognitive functions were determined by the battery of cognitive tests (Addenbrook's test, ACE-R; Mini Mental State Examination, MMSE; Montreal Cognitive Assessment, MoCA; computerized tests CogState and MemTrax). Glucose tolerance was evaluated by oral glucose tolerance test (oGTT) and hippocampal volume by Magnetic Resonance Imaging (MRI). Long-term supervised aerobic-strength training (2 × 1h/week, for ~12 months) was performed in a subpopulation of seniors (n = 16). **Results:** Performance in standardized cognitive tests MMSE, MoCA, ACE-R was negatively associated with 2h glycaemia (R = -0.46; R = -0.39; R = -0.43; p< 0.01) and positively with sport index (self-assessed sport activity) (MMSE, R = 0.31; ACE-R, R = 0.29, p< 0.05). Hippocampal volume negatively correlated with 2h glycemia (oGTT, R = -0.49, p< 0.05) and there was a trend towards a positive association with physical activity (leisure time index, R = 0.39, p = 0.063). Sport index and 2h glycemia were the strongest age, gender and BMI-independent predictors of cognitive functions (multiple regression analysis). Working memory test score was negatively (CogState, R = -0.47, p< 0.05) and reaction time was positively (MemTrax, R = 0.72, p< 0.05) associated with 2h glycemia. Supervised aerobic-strength training intervention improved cognitive performance in seniors with Mild Cognitive Impairment (MCI, n = 16; ACE-R, p< 0.05; learning & amp; working memory: CogState; p< 0.05). **Conclusions:** Impaired glucose metabolism and low physical activity were associated with impaired cognitive functions in seniors, supporting a role of active lifestyle in prevention of age-associated cognitive and metabolic decline. Long-term regular physical activity has a potential to improve cognitive functions in seniors with MCI.

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GUIDED E-POSTER PRESENTATIONS

74. The impact of obesity on alternative renin-angiotensin system pathways in adipose tissue

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The classical adipose renin-angiotensin system (RAS) has been found to be over-activated during the obesity and locally generated angiotensin (Ang) II may contribute to the obesity pathogenesis. The contemporary view on the RAS has become more complex with the discovery of its alternative pathways including angiotensin-converting enzyme 2 (ACE2)/Ang-(1–7)/Mas receptor and (pro)renin receptor (PRR). It has been proposed that Ang-(1–7) counteracts with most of the Ang II-mediated deleterious effects implying its beneficial role in the glucose and lipid metabolism, oxidative stress, inflammation and insulin resistance. PRR may play a role in the increasing the local

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production of Ang II in adipose tissue as well as triggering signal transductions independently of Ang II. The main objective of the study was to assess the modulation of alternative RAS pathways during obesity in visceral adipose tissue of rats and in subcutaneous adipose depot (SAT) in humans. Seventeen lean young healthy male subjects with BMI < 25 kg/m^2 and thirteen obese young healthy male subjects with BMI > 30 kg/m^2 were participating in our study. The expression of RAS components was quantified by Real Time qPCR in SAT obtained by biopsy. The modulation of alternative RAS pathway components during obesity in animals were studied by the gene and protein expression in epididymal adipose tissue of Zucker rats, representing a genetic model of obesity. Our results showed significantly elevated transcription of PRR gene and oppositely decreased gene expression of ACE2 in SAT of obese subjects. Furthermore, the expression of PRR positively correlated ($r = 0.813$, $p < 0.001$) and the expression of ACE2 negatively correlated ($r = -0.514$, $p < 0.01$) with BMI. In obese Zucker rats we observed significantly increased adipose expression of PRR when compared with lean controls. However, obesity development had no impact on ACE2 and Mas receptor transcription in visceral adipose depot in these rats. Our findings indicate that PRR in adipose tissue is modulated by obesity. Our results point out that PRR by Ang II-dependent or -independent manner may affect the adipose tissue homeostasis and functions, and that PRR may substantially contribute to the pathophysiology of obesity.

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75. Adipose tissue contributes to rapid normalization of macrophage and liver-cell lipid handling during dietary reversal of obesity, despite continued inflammation

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Background: Adipose tissue inflammation and dysfunction are considered central in the pathogenesis of obesity-related dys-metabolism, but their role in the rapid metabolic recovery upon obesity reversal is less investigated. We hypothesized that changes in adipose-tissue para-endocrine mechanisms may support the rapid improvement of obesity induced impairment in cellular lipid handling. **Methods:** C57Bl-6J mice were fed **ad-libitum** either normal chow (NC) or high-fat Feeding (HFF) for 10 weeks. A dietary Reversal group was fed HFF for 8 weeks, then switched to NC for 2 weeks (HFF- > NC). **Results:** Whole-body glucose homeostasis rapidly nearly-normalized in the HFF- > NC mice (fasting glucose and insulin normalized, glucose and insulin tolerance tests reversed 82 % to the NC group levels). During 2 weeks of dietary reversal, the liver was significantly cleared from ectopic fat accumulation, and functionally glucose production tests were completely normalized. In contrast, adipose-tissue inflammation (macrophages, pro-inflammatory cytokine expression) largely remained as in HFF, though adipose-tissue macrophage lipid content was ~50 % decreased, and adipose-tissue MAP kinase activation was reversed. Nevertheless, *ex-vivo* mild changes in adipose-tissue adipocytokine profile (but not glycerol release per gram tissue) were noted. These corresponded to partial or full reversal of the excess cellular lipid droplet accumulation induced by HFF conditioned media in liver-derived cells or in macrophages, respectively. **Conclusions:** We propose that rapid metabolic normalization early following nutritional obesity reversal precedes resolution of adipose-tissue inflammation. Nevertheless, adipose-tissue's paracrine/endocrine function supports improved regulation of lipid handling by the liver and by macrophage.

76. Hydrogen-rich water alleviates ethanol induced fatty liver via anti-oxidation and anti-inflammation in mice

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Aims: To investigate the effects of hydrogen-rich water (HRW) treatment on prevention of ethanol (EtOH)-induced early fatty liver in mice. **Methods:** *In vitro* reduction of hydrogen peroxide by HRW was determined with a chemiluminescence system. Female mice were randomly divided into five groups: control, EtOH, EtOH + silymarin, EtOH + HRW and EtOH + silymarin + HRW. Each group was fed a Lieber-DeCarli liquid diet containing EtOH or isocaloric maltose dextrin (control diet). Silymarin was used as a positive control to compare HRW efficacy against

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chronic EtOH-induced hepatotoxicity. HRW was freshly prepared and given at a dosage of 1.2 mL/mouse trice daily. Blood and liver tissue were collected after chronic-binge liquid-diet feeding for 12 weeks. **Results:** The *in vitro* study showed that HRW directly scavenged hydrogen peroxide. The *in vivo* study showed that HRW increased expression of acyl ghrelin, which was correlated with food intake. HRW treatment significantly reduced EtOH-induced increases in serum alanine aminotransferase, aspartate aminotransferase, triglycerol and total cholesterol levels, hepatic lipid accumulation and inflammatory cytokines, including TNF-α and IL-6. HRW attenuated malondialdehyde level, restored glutathione depletion and increased superoxide dismutase, glutathione peroxidase and catalase activities in the liver. Moreover, HRW reduced TNF-α and IL-6 levels but increased IL-10 and IL-22 levels. **Conclusion:** HRW protects against chronic EtOH-induced liver injury, possibly by inducing acyl ghrelin to suppress the pro-inflammatory cytokines TNF-α and IL-6 and induce IL-10 and IL-22, thus activating antioxidant enzymes against oxidative stress.

77. Obesity brings forward the age-related changes of food intake regulation by anorexigenic neuropeptides in rats

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Background: Middle age is characterized by obesity later followed by anorexia of aging leading to sarcopenia. Aging-associated rise in body weight or obesity had often been explained by age-related decrease of sensitivity to anorexigenic leptin. **Previous observations:** Our earlier studies in ad libitum fed male Wistar rats have shown that after a fast increase of body weight in juvenile animals (up to age 3–4-months) a further rise was demonstrated at mid-ages of 6–12-months and early-aged 18-months, then a fall was observed by old age of 24-months. In female rats body weight did not change after age 3–4-months. The body weight course of male rats may also be influenced by changes in feeding: as compared with normally ad libitum fed (NF) animals, in high-fat diet-induced obesity (HF) body weight reached significantly higher levels by 6–12-months and at age 18-months, while in calorie-restricted (CR) rats there was no weight rise after age 3–4-months. **Question:** Is responsiveness to anorexigenic peptides influenced either by aging or by nutritional state? **Methods:** The influence of administration of alpha-melanocyte stimulating hormone (alpha-MSH), or leptin by 7-days long intracerebroventricular (ICV) infusion on spontaneous food intake, or ICV injections on fasting-induced re-feeding food intake after, as well as the influence of intraperitoneal cholecystokinin (CCK) on re-feeding was analyzed in male rats of different ages. The effects of leptin and CCK were analyzed also in rats of different nutritional states (NF, HF, CR). **Results:** The strong anorexigenic effect of these peptides in young NF rats was followed by decreased sensitivity in mid-aged animals, while the sensitivity increased again in NF18 and even more in NF24 rats. In CR rats the sensitivity to the anorexigenic peptides remained pronounced as in mid-aged animals (similar to those in young animals), and it definitely increased in old animals. In contrast, in HF obese rats the responsiveness to CCK and leptin was very low at early mid-ages (HF6), but increased again already in late mid-aged (HF12) animals. **Conclusions:** Age *per se* does not decrease, but definitely increases the anorexigenic responsiveness to the investigated peptides. In contrast, an obesogenic diet may suppress the responsiveness (thereby may promote the development of obesity) in early mid-aged animals, and this may also bring forward (to age 12-months) the enhanced responsiveness that would be characteristic for the old animals – as if obesity speeded up the aging process.

78. Extracellular DNA and bariatric surgery

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Background: The only treatment of obesity that has long-term positive effects in the real life is bariatric surgery. These effects do not include only the loss of bodyweight, but also improvements of insulin sensitivity and decrease in microinflammation. Extracellular DNA (ecDNA) is higher in obesity likely due to the release from adipocytes. Whether changes in weight after bariatric surgery are accompanied by changes in ecDNA is unknown. **Materials & Methods:** Blood samples were collected from obese patients before bariatric surgery, one day after surgery and during control visits 3 months and one year after surgery. Total ecDNA and its subcellular origin was assessed

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using spectrofluorometry and real time PCR. In addition, the deoxyribonuclease activity was quantified. The dynamics was analyzed using repeated measures ANOVA. **Results:** Bariatric surgery led to a considerable weight loss in all treated patients ($p < 0.001$). The surgery temporarily led to a slight but significant increase in plasma ecDNA ($p < 0.05$). However, after 3 months and one year plasma ecDNA of both, nuclear and mitochondrial origin, was decreased in comparison to baseline concentrations ($p < 0.01$). Interestingly, the reduction of ecDNA was associated with an increase in plasma deoxyribonuclease activity ($p < 0.05$). **Conclusions:** Due to the enormous prevalence of obesity it is of utmost importance to search for the mechanisms underlying the metabolic consequences of bariatric surgery. Recently published experiments pointed towards ecDNA as a likely pathogenic link between obesity and metabolic syndrome. The results of our study might indicate that the beneficial effects of bariatric surgery might be partially mediated by the decrease of plasma ecDNA. Further studies are needed to prove whether the observed associations of ecDNA and deoxyribonuclease activity are causal.

79. Management of a chronic staple line leak following laparoscopic sleeve resection

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Background: As it is easy to be performed, even in super obese patients, since 2010 laparoscopic sleeve resection (LSR) is the most performed bariatric procedure in Germany and on its way to become the leading procedure worldwide. Until now staple line leak (SLL) is a rare but still unsolved problem in LSR. Common tools in managing this complication are endoscopy (stenting, over the scope clipping and endovac therapy) and interventional radiology (CT targeted puncture). The sleeve is a system of high intraluminal pressure, thus leaks following LSR tend to become chronic, leading to a long healing process. We present the case of a patient in which a chronic leak was successfully treated by surgical intervention one year after it occurred. **Case history:** A 56 year old male patient with a BMI of 44.8 kg/m^2 underwent a LRS in April 2014. We used a 60 mm ECHELON FLEX™ ENDOPATH™ stapler (four green and five gold reloads, no staple line buttress reinforcement). A 36 Ch bougie was placed prior to stapling. According to our routine over sewing of the proximal three to four cm of the staple line was performed. Intraoperative methylene blue test was inconspicuous. A drain was placed next to the staple line. Initial course was without any complication, except a bloody secretion of 100 ml per day via the drain, Postoperative gastrografin study on the 6th postoperative day showed a regular shaped sleeve and no leak. As secretion via the drain persisted, relaparoscopy on day 8 revealed a diffuse bleeding of the greater omentum. Again the methylene blue test was inconspicuous. On the 11th postoperative day blood samples showed an increase of inflammation parameters, the compelled CT scan a proximal SLL surrounded by a huge abscess. The patient´s state of health improved due to CT targeted puncture until day 15, when we performed endoscopy, without visible evidence for SLL. The patient was discharged with the drain and had again endoscopy two month following surgery. This time endoscopic finding suggested a proximal SLL, wherefore stenting was performed. From August 2014 till February 2015 the patient had two further unsuccessful attempts of stenting and multiple sessions of endovac therapy which resulted in a reduced secretion of 10 ml per day via the drain but could not lead to healing up of the SLL. In May 2015 a laparoscopic attempt of over sewing the SLL was performed, resulting in recurrence of the SLL within a few days. Again the patient had several sessions of endovac therapy. In April 2015, almost one year after the initial sleeve we decided to drain the SLL in an excluded jejuna loop via an open access. The further course was regular, until now the Patient is symptom free with am BMI of 28 kg/m^2. **Conclusion:** Draining of a SLL in an excluded jejuna loop might be a further tool in managing this rare but often long lasting complication of LSR. In case of chronification of the SLL this procedure should be contemplated early in the disease course.

80. Are proton pump inhibitors associated with weight gain?

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Proton pump inhibitors (PPIs) have been demonstrated to induce small intestinal bacterial overgrowth and a decrease in small intestinal pH value. Recent studies reported that the percent excess weight loss at 6 months after bariatric surgery was smaller in PPI users than in non-PPI users among the obese. In addition, the use of either PPIs

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or histamine-2 receptor blockers was linked with suboptimal weight loss among obese subjects aged > 40 years. We investigated the impact of PPIs on normal body mass index (BMI) patients with gastric ulcers. Those with endoscopically proven *Helicobacter pylori* (HP)–negative gastric ulcer took oral rabeprazole sodium 20 mg per day, continuously for 4 months. On the other hand, subjects with HP–positive gastric ulcer received combination therapy (rabeprazole sodium 20 mg bid, clarithromycin 500 mg bid, and amoxicillin 1,000 mg bid) for 7 consecutive days as treatment for HP followed by rabeprazole 20 mg per day for the next 4 months. In 21 patients with HP–negative gastric ulcer, no significant change was observed in body weight or BMI as compared with baseline values. In 25 patients with HP–positive gastric ulcer, there were no significant changes in body weight (BW) and BMI in both the successful eradication (19 patients) and failed eradication groups (9 patients). Analysis of patients aged aged > 40 years did not reveal any significant changes in BW and BMI after treatment in both the successful eradication and failed eradication groups. In conclusion, the 4-month rabeprazole treatment does not induce weight gain in lean subjects with HP–negative gastric ulcer. Irrespective of HP eradication, the 4-month rabeprazole treatment did not contribute to weight gain in patients aged > 40 years with a normal BMI and HP-positive gastric ulcer, either. However, future studies are needed to confirm the long-term effects of different PPIs on body weight in both lean and obese subjects.

81. Non-invasive determination of liver fibrosis in patients with non-alcoholic fatty liver and cardiometabolic risk factors

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Background: NAFLD is the common comorbidity in patients with overweight and obesity (with appearance in 60–95 % of obese patients and 100 % of obese diabetics). Determination of liver fibrosis is the most important point in the course of liver disease. Various non-invasive scoring indexes of liver fibrosis together with transient elastography have been used over the past years. **Aim:** Two non-invasive scoring models of liver fibrosis NAFLD score and APRI index together with transient elastography (TE) were used in patients with non-alcoholic fatty liver (NAFL) and cardiometabolic risk factors. The aim was an early assessment of significant liver fibrosis. **Patients and Methods:** A total number of 35 patients (22 women, 13 men) with NAFL with the mean age 61.77 ± 13.01 years were examined. Inclusion criteria included: age over 18 years, fatty liver detected by ultrasonographical examination, daily alcohol intake less than 20 g/30 g (for women/men, respectively), overweight or obesity together with two risk factors of metabolic syndrome. The following clinical and laboratory parameters were examined: weight, height, waist circumference, blood pressure, ALT, AST, triacylglycerols (TG), platelets, and albumin. NAFLD score (ALT, AST, albumin, TG) and APRI index (AST, platelets) were calculated. Interpretation: APRI > 1.5 – positive predictive value, APRI > 1.0 – cirrhosis, APRI 0.7 – significant fibrosis, APRI < 0.5 – negative predictive value, 0.5 < APRI < 0.7 – undetermined score, degree of liver stiffness was detected by TE (F0–F4), according to the NAFLD score patients were divided into F0–F2, F3–F4, and undetermined score. **Results:** The highest degree of valid results were found by TE comparing to APRI index and NAFLD score. Severe fibrosis (F3–F4) was detected in 23 % patients by TE, in 11.6 % by APRI and in 20 % of patients by NAFLD score. A disadvantage of NAFLD score was the highest degree of undetermined values (40 %) found in 17.1 % of patients by APRI index. A correlation of age with a degree of fibrosis was found by TE, and an inverse correlation of platelets with the fibrosis stage was found. A linear correlation of detected degree of fibrosis by TE and APRI index was found. **Conclusion:** A high degree of significant fibrosis was found in patients with NAFL and cardiometabolic risk factors. From the preventive point of view, earlier detection of high-risk patients should be done to achieve better results. We recommend the following tools for liver fibrosis screening: APRI index may be the first-line tool; in the case of the undetermined score, then TE should be the tool of the second line. APRI index is a cheap, simple, repeatable tool for the general use in practitioners, even in those, where TE is not available.

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82. Fatty liver screening based on fatty liver index (FLI)

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Background: Fatty liver (FL) is one of the most common liver diseases in western countries with an estimated prevalence of 25–30 %. The fatty liver index (FLI) represents a simple clinical laboratory method of fatty liver screening. **Aim:** The aim of the project was to assess the applicability of the methodology in the routine practice of a biochemical laboratory in cooperation with paediatrician, general practitioner and gastroenterologist. **Methods:** The cohort was selected on the basis of routine clinical practice of general practitioners and gastroenterologists. The inclusion of patients into the cohort was based on a clinical judgement of the examining physician assuming possible FL (at least two parameters of metabolic syndrome present). A total number of 146 patients aged between 8 and 88 years were included. Data collection ran from 1 April 2016 to 16 February 2017. Patients were classified according to their weight, height, BMI, waist circumference, triglycerides and gamma-glutamyltransferase. Based on the above data, FLI was calculated. FLI < 30 ruled out the FL diagnosis and FLI ≥ 60 ruled in FL. **Results:** We divided the group of cohort by age into 2 groups: 1st ≤ 18 years (juvenile) and 2nd > 19 years (adult). The juvenile group consisted of 44 patients (26 boys; 18 girls), with the mean age of 13.2 years, an average weight of 81 kg, and BMI of 29.75. The FLI index greater than ≥ 60 was found in 43.2 % of the patients, FL was ruled out in 15.9 % of juvenile patients. The adult group of 102 patients included 43 men and 59 women. The mean age of the group was 50.6 years; the average weight of the group was 91 kg, BMI 30.72. FLI indicative of FL reached 73.5 % and steatosis was ruled out in 8.8 % of patients. **Discussion:** According to the analysed data, we can state that there is a high prevalence of overweight (40.9 %) and obesity (45.3 %) among juvenile patients which comes with a very high risk of passing obesity and overweight into adulthood, associating with other manifestations of metabolic syndrome as well. FLI evaluation allows for further diagnostic procedures in patients with FLI ≥ 60. It is advised to undergo an ultrasound examination of the liver, laboratory ALT, AST, platelet count and albumin. These tests could allow for a detection of potential cirrhosis of the liver and would enable the practitioner to send the patient to the hepatologist. **Conclusion:** The advantage of FLI is the ability to perform FL screening based on a single examination by a practitioner or specialist. For this reason, FLI is suitable for the use in primary prevention of screening of fatty liver at population level and is useful in paediatric and adolescent practice. Positive FLI is also a tool for persuading the patient to collaborate in order to change their lifestyle and is a precursor for consistent treatment of the metabolic syndrome and FL. It is the juvenile and early adult age that provides us with the best chance of success in achieving a change in patient´s lifestyle.

83. Metabolic factors and non alcoholic fatty liver in patients with impaired glucose tolerance

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Background and aims: Non alcoholic fatty liver disease (NAFLD) includes a wide range of liver disease, from simple hepatic steatosis, to non alcoholic steatohepatitis and liver cirrhosis. The aim of this study is to investigate the metabolic factors that affect NAFLD in patients with impaired glucose tolerance (IGT). **Materials and methods:** The study includes 122 patients with mean age 62 ± 7 years. IGT was defined according to the IGT criteria. All patients underwent liver ultrasound and blood tests (glucose, glucose 2 hours after charging, total cholesterol, HDL cholesterol, LDL cholesterol, triglycerides, lipoprotein a). Participants were devided into 2 groups according to the presence or not of NAFLD. The results were expressed as mean value ± standard deviation. For the univariate analysis between the 2 groups, continuous variables were studied under the student t-test. Statistical significance was

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considered when the P < 0.05. **Results:** Out of 122 patients, NAFLD was found in 70 patients (57 %) that consist group A; 37 were men (53 %) and 33 women (47 %). Group B consists of the remaining 52 patients (43 %) -25 men (48 %) and 27 women (52 %) – that did not have NAFLD. Comparison of biochemical tests characteristics between the two groups are presented in the table (NS: statistically not significant). **Conclusion:** There is a possible correlation among diabetes mellitus, metabolic profile and NAFLD in patients with IGT.

84. Prevalence and risks factors of New–onset diabetes mellitus after liver transplantation (NODAT): single-centre experience

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Introduction: After solid organ transplantation including liver transplantation (LTx), NODAT is a frequent complication: One year after LTx, NODAT was diagnosed in 9–21 % of patients (pts). It is associated with higher risks of cardiovascular diseases, infection, reduced patient survival, graft rejection, or accelerated loss of graft function. Risk factors of NODAT are either non-modifiable (age, gender, family history of DM), or modifiable [type of immunosuppressive therapy (IS), obesity and other components of metabolic syndrome (MS), infections with hepatitis C virus (HCV) and cytomegalovirus (CMV), hypomagnesaemia (êMg), etc.]. Identification of these risk factors before LTx as well as early diagnosing and correct management are needed to improve long-term patient and graft outcomes. **Aim:** To determine the prevalences of NODAT, and its modifiable and non-modifiable risks factors in pts after LTx in the Transplant Center Banska Bystrica (TC BB). **Methods:** Retrospective analysis. Review of the records retrieved from the electronic hospital database (ZM). **Study interval:** may 2008–may 2016. **Inclusion criteria:** LTx in TC BB. **Exclusion criteria:** DM at the time of LTx; malignancy; follow-up shorter than 6 months; IS by cyclosporine A. **Recorded variables:** age; gender; etiology of liver disease leading to LTx; MELD score; Child-Pugh score; family history of DM; body mass index (BMI [kg/m^2]; trough levels of tacrolimus (TAC, ng/ml). The statistical analysis was performed by MedCalc 13.1.2. The results given here are from the month 6 of follow-up. **Results:** Of the 150 pts transplanted during the study interval, 102 fulfilled predetermined criteria. Mean age was 50 years (22–67, signifficantly higher in women); 60 were men (54 %). Mean BMI was 25.5 ± 4.8, MELD 18 ± 5, Child-Pugh 10 ± 2. The most frequent etiology of cirrhosis was alcoholic liver disease (ALD, in 42 % of pts). NODAT occurred in 19 (18.6 %) of 102 LTx recipients. In multivariate analysis, ALD etiology and TAC > 10 were associated with an increased risk of NODAT. **Conclusions:** In this selected cohort with overweight 6 months after LTx, NODAT occured in one-in-five pts, more so if underlying etiology of liver disease was ALD, and TAC levels higher than 10 ng/ml.

85. Overweight, obesity, and putative contribution of non-alcoholic fatty liver disease (NAFLD) to the patients undergoing liver transplantation (LTx) for etiologies other than NAFLD: analysis of the cohort

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Background: Due to the dynamics of diabesity, non-alcoholic steatohepatitis (NASH) is the major/increasing etiology of liver transplantation (LTx). In 10 years untill 2014, NASH grew 170 % as LTx-indication. Relationship between NASH and other ACLD etiologies is oxymoronous: a) NASH is the diagnosis of exclusion, but b) can contribute to the progression of i.e. alcoholic liver disease (ALD, called BASH [B = both]); hepatitis C (CHC), etc. The role of NAFLD/NASH as co-factor in the progression to LTx of other ACLD etiologies was suspected since the body mass index (BMI, kg/m^2) in our pts post-LTx seemed to reach or surmount that of pre-ACLD phase in both NASH, and non-NASH ACLDs. Since NASH tends to disappear from liver histology in terminal phases of ACLD, to study its contribution in non-NASH cohort we decided to use Fatty Liver Index (FLI) calculated post-LTx: at the time pts use to reach premorbid-pre-LTx BMI. **Aims:** To determine post-LTx **i)** the trajectory of BMI; **ii)** FLI in pts LTx for non-NASH indications. **Methods:** Prospective study. Data retrieval from medical records of LTx at HEGITO (JB). Study interval: 2015–2016. *Inclusion criteria* LTx; recorded variables present. *Recorded variables*: Age, gender, LTx indication, body weight, waist

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circumpherence, triglycerides, γ-GMT (FLI) at LTx and months 3, 6, 12. *Exclusion criteria*: death before month 12 of follow-up. Overweight = BMI > 25; obesity = BMI > 30. Post-LTx FLI > 60 was deemed suggestive of pre-LTx NAFLD. **Results:** During study interval of XX months 21 of 54 LTx pts fulfilled all the pre-determined criteria. Men = 6, age 49 years (24–62), LTx for non-NASH = 20 (95 %). Overweight at months 3, 6, and 12 was found in 5 (15 %), 7 (35 %), and 9 (45 %) pts; obesity in 1 (5 %), 2 (10 %), and 3 (15 %) pts. FLI > 60 in 1 (5 %), 2 (10 %), and 3 (15 %). **Conclusions:** One year after LTx, overweight, obesity, and FLI suggestive of NAFLD evolve in 45 %, 15 %, and 15 % of pts undergoing LTx for non-NASH indications, respectively. The complexity of interrelationships between pre- and post-LTx factors leading to NAFLD/NASH notwithstanding, these results support the notion that NAFLD/NASH can play a role in the progression to LTx of liver diseases other than NASH.

86. Obesity and posttransplant diabetes mellitus in Slovakia

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Introduction: The incidence of posttransplant diabetes mellitus (PTDM) after kidney transplantation (KT) is 5–40 %. The objective of the analysis is to identify the risk factors of PTDM after KT in the Slovak Republic (SR). **Materials and methods:** In the group of 133 patients/non-diabetics, we identified the risk factors of PTDM in the monitored period of 12 months from transplantation. **Results:** The incidence of PTDM in the SR in 2014 was 38.3 %. By logistic regression, we discovered that the age at the time of KT [odds ratio 1.0885; 95 % CI 1.0222–1.1592 (P = 0.0082)], the value of body mass index at the time of KT [odds ratio 1.4606; 95 % CI 1.0099–2.1125 (P = 0.0442)], and the value of insulin resistance index **(**HOMA-IR) at the time of KT [odds ratio 2.5183; 95 % CI 1.7119–3.4692 (P < 0.0001)] represent predictive factors of PTDM. The independent risk factors of PTDM in our group are: age at the time of KT of more than 60 years [HR 0.3871; 95 % CI 0.1659–1.7767 (P = 0.0281)], waist circumference at the time of KT in males more than 94 cm and in females more than 80 cm [HR 3.4833; 95 % CI 1.2789–9.4878 (P = 0.0146)], BMI at the time of KT [HR 3.0011; 95 % CI 1.0725–8.3977 (P = 0.0363)], and triacylglycerols at the time of KT more than 1.7 mmol/l [HR 2.9763; 95 % CI 1.0141–8.7352 (P = 0.0471)]. **Conclusion:** In the group of Slovak patients after kidney transplantation, the dominating risk factor for PTDM development is insulin resistance prior to KT.

87. Pigment epithelium derived factor and C1q/TNF-related protein 9 in patients with type 2 diabetes; their relationship to metabolic syndrome and vascular damage

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Introduction: Pigment epithelium derived factor (PEDF) and C1q/TNF–related protein 9 (CTRP-9) belong to novel adipokines, which may contribute on insulin resistance and vascular damage. Aim of the study was to compare their circulating levels in type 2 diabetes patients with and without metabolic syndrome (MS) to healthy controls. Their relations to risk cardiovascular factors and markers of vascular damage were detected too. **Methods:** Fifty individuals with type 2 diabetes (23 men, 27 women) and forty healthy controls (15 men, 25 women) were included to the study. PEDF, CTRP-9, lipids, anthropological parameters, markers of insulin resistance and diabetes compensation were investigated in all subjects. Diabetics were divided into two groups: with (n = 30; 11 men, 19 women) and without (n = 20; 12 men, 8 women) MS. Von Willebrand factor and plasminogen activator inhibitor-1 (PAI-1) served as markers of endothelial dysfunction. Markers of arterial stiffness – augmentation index (AI) and pulse wave velocity (PWV) – were measured as other parameters of vascular damage. **Results:** Compared to healthy controls only diabetics with MS had higher levels of PEDF [14,160 (10,240–16,000) ng/ml versus 11,120 (8,560–14,400) ng/ml; p < 0.05]. CTRP-9 levels did not significantly differ between groups. In all subjects PEDF significantly (p < 0.05) correlated: positively with BMI, waist circumference, hs-CRP, triglycerides, non-HDL cholesterol, apolipoprotein B, fasting glucose, glycated hemoglobin, C-peptide and insulin; negatively with HDL-cholesterol and apolipoprotein A1. Additionally, in patients with diabetes a negative correlation of PEDF with PWV (ρ = -0.34; p < 0.05) and in diabetics with MS a negative correlation of

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PEDF with vWF (ρ = -0.46 p < 0.05) were found. CTRP-9 levels positively correlated with vWF (ρ = 0.56; p < 0.05) and PAI-1 (ρ = 0.57; p < 0.05) only in group of diabetics with MS. **Conclusion:** Patients with type 2 diabetes and MS have significantly higher levels of PEDF, which are associated with symptoms of MS and insulin resistance. A negative correlation of PEDF with some markers of vascular damage may point out its vascular protective role.

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88. Effect of aging on lipogenic potential of human subcutaneous adipose tissue and adipocytes

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Background: Subcutaneous adipose tissue (SAT) is an organ specialized for the synthesis and metabolically safe storage of lipids. In aging, however, the capacity of SAT to store lipids decreases and this results in metabolically unfavorable fat redistribution and insulin resistance. Despite substantial health impact of this SAT dysfunction in elderly, its cellular and molecular triggers remain rather unclear. It has been suggested that the age-related dysfunction of various tissues can be partly related to the accumulation of senescent cells. Moreover, the storage of lipids in adipocytes can be inhibited by endoplasmic reticulum stress (ERS) that appears to be higher in SAT from aged mice. Therefore, we aimed to investigate lipogenic capacity of human SAT in relation to senescence and ERS markers. **Subjects and methods:** SAT samples were obtained by needle biopsies from two groups of women (n = 15, each group), differing in age (36 vs. 72 years) but matched for fat mass. SAT samples were used for qPCR analysis of mRNA levels of genes involved in lipogenesis (ACLY, ACACA, FASN, DGAT2, SCD1, ELOVL6), ERS (HSPA5, XBP1s, DNAJC3, HYOU1, EDEM1, GADD34, CHOP, PERK, CALR) and senescence (p16, p27, NOX4, GDF15, DLC1). Similar qPCR analysis was performed in in vitro differentiated adipocytes derived from the same samples of SAT (n = 7–10 per group). **Results:** Compared to SAT from young group, aged SAT exhibited reduced mRNA expression of two important lipogenic enzymes, FASN and DGAT2, together with higher mRNA levels of senescence markers p16INK4a and NOX4. Even though mRNA expression of two additional senescence markers, p27 and GDF15, was not different in SAT from the two groups of women, the negative correlation between their expression and mRNA expression of all analyzed lipogenic markers was found. Similar relationship was found among GDF15, NOX4 and lipogenic markers in in vitro differentiated adipocytes. As expected, the expression of XBP1s, an essential transcription factor of IRE-1 branch of unfolded protein response, was increased in aged SAT, but the expression of its target genes, chaperones HSPA5, DNAJC3 and HYOU1, was surprisingly diminished in SAT from the elderly compared to the young. Intriguingly, expression of these ERS chaperones correlated positively with the expression of lipogenic enzymes. These results were partly recapitulated in in vitro differentiated adipocytes from SAT of the same individuals. **Conclusions:** Higher expression of GDF15, a cytokine linked to senescence and mitochondrial dysfunction, is linked with decreased lipogenesis in both human SAT and subcutaneous adipocytes. Reduced capability of aged SAT to express ER chaperons may contribute to worsening of lipogenic SAT function in the elderly.

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89. Obesity and T2DM related changes of skeletal muscle secretory profile: in vitro and in vivo studies

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Introduction: Myokines are products of skeletal muscle involved in regulation of energy metabolism, muscle functional and structural remodeling including angiogenesis and inflammation. Muscle secretory profile can be

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modulated by physical (in)activity, inflammation, lipids, insulin resistance or hyperglycemia. **Aims:** We aimed to investigate the regulation of CC / CXC chemokines (MCP1, IL8, NAP2, GROα), their receptors and macrophage activity markers in human skeletal muscle and primary muscle cells derived from individuals with obesity, prediabetes and type 2 diabetes (T2D). **Subjects & methods:** Volunteers (men, n = 97): healthy lean controls; obese: with normal glucose tolerance (NGT), prediabetes or newly diagnosed T2D. Glucose tolerance (oGTT), whole-body insulin sensitivity (euglycemic hyperinsulinemic clamp, EHC), body composition (bioimpedance), intramyocellular & hepatic lipid content (^{1}H-MRS) and physical activity (accelerometer) were assessed. Muscle samples were taken by Bergstrom needle biopsy *(m. vastus lateralis).* Primary skeletal muscle cells were treated with palmitate (100 μM) or glucose (5.5/10/20 mM). Myokines secretion into conditioned media was assessed by multiplex assay (Millipore), gene expression in tissue and cells by qPCR. **Results:** In vitro, gene expression and media content of selected myokines tended to decrease with obesity, prediabetes and T2D ($p > 0.05$). Palmitate treatment reduced MCP1 secretion in myotubes from obese and T2D individuals compared to lean ($p < 0.05$) and increased IL8 mRNA in myotubes derived from obese individuals ($p < 0.05$). Prediabetes was associated with higher mRNA levels of IL8 ($p = 0.07$), GROα, NAP2 ($p < 0.01$) and their receptors CXCR1 ($p < 0.01$), CXCR2 ($p < 0.05$) in skeletal muscle tissue. T2D was associated with increased MCP1 mRNA ($p < 0.01$) in muscle, but the mRNA levels of its receptor CCR2a were not changed. Markers for both M1- (CD86, CD40) and M2- (CD206, CD163) macrophages significantly increased in muscle with T2D ($p < 0.05$). Muscle myokines expression positively correlated with obesity (BMI, body fat, extramyocellular lipids), fasting glycemia and insulinemia, hepatic lipid content and transaminases and LDL-cholesterol ($p < 0.05$). **Conclusion:** Increased production of selected myokines (chemokines) in skeletal muscle of patients with prediabetes and type 2 diabetes suggests a gradual parallel activation of inflammatory state with metabolic disease progression. Reciprocal changes in skeletal muscle and primary muscle cells in (pre)diabetes may suggest, that (i) regulatory factors associated with the development of metabolic disease exist in integrated organism, (ii) apart from muscle fibers, other cell types (e.g. endothelial cells, leukocytes) contribute to the myokine expression/ secretion in skeletal muscle *ex vivo.*

90. Diurnal changes of acetylcarnitine in human vastus lateralis muscle and response to exercise

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Introduction: Skeletal muscle is the main reservoir of carnitine, which plays an important role in fat metabolism since it servesas a shuttle for acetyl groups to mitochondrial matrix. Therefore, acetylcarnitine covers also a key role in glucose metabolism and is implicated in the pathogenesis of insulin resistance contributing to a diagnosis of Type 2 Diabetes. Since acetylcarnitine concentrations in plasma are known to vary during the day and increase after high-intensity exercise we aimed to investigate the diurnal and exercise related changes in concentration of acetylcarnitine at 2.13 ppm in skeletal muscle non-invasively, using a long echo-time ^{1}H MRS at 7T. **Methods:** All measurements were performed on a 7T whole body Siemens MR system with knee coil. Five healthy volunteers participated in this study. They were positioned supine in the magnet and the measurement was performed on left vastus lateralis (VL) muscle. T_1 weighted images were acquired. The MRS VOI ($40 \times 35 \times 15$ mm^3) was carefully placed into the VL muscle. Localized shimming was performed manually. Data were obtained using STEAM sequence with TR/TE = 2,000/350 ms. For absolute quantification determination, water signal was measured separately (TR/TE = 2,000/20 ms). All volunteers underwent first measurement early in the morning, after overnight fast and no strenuous exercise in the morning. Second measurement from the same VOIs was performed after normal hospital canteen lunch. Subsequently, volunteers performed high intensity exercise. The ^{1}H MRS measurements were repeated twice after the exercise (starting at 0 and 15 min). The absolute concentration of acetylcarnitine was calculated according to the formula for milimolar concentration in wet weight: $C_{AC} = (S_{AC}/S_w) \times (CF_w/CF_{AC}) \times cw \times nw \times w$ % where S are signals of metabolites (W – water, AC – acetylcarnitine), CF are correction factors for T_1 and T_2 relaxations, $c_w = 55$ mol/L is the molar concentration of the water, $n_w = 2$ is the number of protons in a water molecule and w % is the approximate water content of skeletal muscle tissue. Differences in the values of the acetylcarnitine concentration during diurnal changes and after exercise were tested for significance by repeated-measures ANOVA and Fisher's post-hoc test. **Results:** The measured acetylcarnitine concentration varied during the day, in particular, it decreased by approximately 70 % between the morning (mean ± SD; 11.47 ± 5.34 mmol/kg ww) and

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after the lunch measurement (3.43 ± 1.66 mmol/kg ww). Following 10 minutes of high-intensity exercise the concentration significantly increased (p = 0.021) and again significantly decreased 15 minutes after cessation of the exercise (p = 0.017). **Discussion:** Serum carnitine and acetylcarnitine concentrations were previously found to vary significantly during the day reacting to the plasma free fatty acid concentrations. Free fatty acid concentrations are increased in the fasting state and acutely after exercise, and on the other hand decreased after a carbohydrate rich meal. Our results from repeated non-invasive ^{1}H-MRS measurements during the day are in good agreement with these findings. Skeletal muscle acetylcarnitine concentrations in the morning were higher than in the afternoon after lunch. Increase of the acetylcarnitine level was detected after high-intensity exercise, and approximately 15 minutes after the cessation of exercise we could detect acetylcarnitine depletion or washout which is in the accordance with the findings on trained group of subjects performed by Seiler et al. 2015.

91. Concordance of bioactive vs. total immunoreactive serum leptin levels in children and adolescents with severe early onset obesity

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Background: Leptin secreted from adipose tissue signals peripheral energy status to the brain. Monogenic leptin deficiency results in severe early onset obesity with hyperphagia. Recently, a similar phenotype of inactivating leptin mutations but with preserved immunoreactivity and hence normal circulating immunoreactive leptin has been reported. **Objective:** We screened a subset of children selected for a high expected likelihood for leptin with reduced bioactivity based on extreme obesity of early onset to identify leptin gene mutation carriers through decreased proportion of bioactive leptin. Furthermore, we compared the association of bioactive and immunoreactive leptin levels with indices of insulin secretion/resistance in obese children. **Design/Setting/Patients:** We measured bioactive and immunoreactive leptin levels in fasting serum samples of 70 children with severe (BMI SDS > 3) non-syndromic obesity with onset. **Results:** The mean levels of bioactive and immunoreactive leptin were almost identical (41.1 ± 25.2 vs. 41.1 ± 25.4 ng/mL). In three probands with the lowest bioactive leptin proportion (< 90 %) we did not identify mutations in the leptin gene. Compared to immunoreactive leptin, bioactive leptin showed similar and slightly better statistical associations with indices of insulin resistance in correlation and multivariate analyses. **Conclusion:** In our sample selected for severe early onset childhood obesity, we did not identify leptin gene mutations leading to decreased proportion of bioactive leptin. Nevertheless, the bioactive leptin levels were stronger associated with selected insulin secretion/resistance indices than the immunoreactive leptin levels.

92. Contribution of GP to prevention of stroke in atrial fibrillation, how obesity can be dangerous

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Background: Atrial fibrillation (AF) is the most frequent arrhythmia in clinical practice. AF contributes to all-cause mortality, heart failure and increases stroke incidence by five-times. GPs play an important role in AF screening. Immediately initiated and well controlled anticoagulation therapy helps to attenuate AF related stroke risk. **Aim:** Patients with risk factors for AF (hypertension, heart failure, obesity, diabetes, age > 65 years, renal diseases and COPD) were screened for AF. **Methods:** Recruited were all patients with risk factors: age > 65, arterial hypertension, heart failure, obesity (BMI > 25), diabetes, stroke/ TIA, renal diseases and COPD who visit GP regularly for chronic medication prescription. We focused on patients with "warning AF signs" (palpitations, fatigue, dizziness, chest pain or changes in cognitive functions). We checked the pulse (screened for AF), blood pressure and body weight. If irregular pulse, ECG was performed. If AF detected on ECG and patient in good condition without symptoms requiring

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hospital admission, scores CHA2DS2VASc and HASBLED were assessed. In patients with CHA2DS2VASc > 1 the anticoagulation therapy with warfarin was initiated. GPs in Slovakia are not allowed to prescribe NOAK's. In patients taking warfarin INR was checked regularly by POCT. **Results:** Total number of registered patients at our office is 2,348 (96.34 %), 86 patients with AF (3.66 %), paroxysmal in 24 (27.9 %) and permanent in 62 patients (72.1 %), 44 men (51.2 %) and 42 women (48.8 %), average age 73.5 years. The main risk factor was hypertension, present in all patients (100 %). The second risk factor was obesity (58 %), followed by heart failure (29 %), stroke (19.7 %) and COPD (3.4 %). Anticoagulation therapy was initiated in 76 % of patients, antiplatelet therapy in 22 %. 2 % of patients refused to take any therapy. **Conclusion:** AF is affecting 1–2 % of adult population worldwide, in our study the prevalence rate was 3.6 %. Surprisingly obesity was the second most common risk factor present. GPs can contribute to AF diagnosing and prevention very simply and easy: checking the pulse, controlling blood pressure and weight and initiating anticoagulation therapy quickly.

93. How many risk factors affecting body weight reduction we know?

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Introduction: Education is the most time-consuming part of the treatment of DM. **Objective:** Stratified risk factors affecting the prevalence of overweight and obesity. **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:** The combined effect of education and drug treatment has been shown to reduce HbA_{1c} IFCC/DCCT and BMI (kg/m^2) by up to 16/11 % and 3 % in women and 20/15 % and 2 % in men in a group of 200 patients after 18 months. **Conclusion:** Based on the results of the questionnaire and subsequent re-education of patients we have in the coming years empirically recorded 40 risk factors affecting body weight reduction.

94. The effect of the regulation on the trans fatty acid content of foods

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Artificial trans fatty acids are formed during the industrial processing of foods, and are proven to be harmful for the human body. They have been associated with an increased risk of cardiovascular disease, abdominal obesity, diabetes, and certain types of cancer. Decree 71/2013 (XI. 20.) of the Ministry of Human Capacities, which has been in force since 18 February 2014, defines the highest permitted amount of trans fats in food products placed on the market in Hungary. The limits are defined according to the total fat content of the foods. The official control of foods are performed by the food chain safety and animal health directorates of the capital and county government offices. They are obliged to report each quarter on the results of inspections related to the trans fatty acid content of food products to the National Food Chain Safety Office, which shall aggregate the data and forward it to the National Institute of Pharmacy and Nutrition (OGYEI). OGYEI sets up a database using the measurement data related to the trans fatty acid content of food products sold to end consumers, carries out a survey on the population's consumption of trans fats, monitors changes of the composition of food products sold to end consumers in relation to the requirements in the decree, and performs laboratory analysis on the trans fatty acid content of food products for the purposes of surveying. In this connection the evaluation of the effect of the regulation has been started in collaboration with the World Health Organization (WHO), which includes a comparison between the trans fatty

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acid content of foods available on the market and the limits set by the regulation, and additionally, a monitoring of population intake. Between 2010 and 2016 the total number of the measured products was 1,586 with special emphasis on biscuits, cakes, wafers, bakery products/fine bakery products, chocolates, products made from chocolate compound, vegetable fats. 900 products were measured before the regulation (2010–2013) and 686 products were measured after (2014–2016). Prior to the regulation an average of 20 % of the food products had a high trans fatty acid content and after the entry into force a significant improvement was observed. In 2016, only less than 2 % of the products exceeded the permitted limits. The regulation has reached its goal, thanks to the standard legislation the number of food products with high trans-fatty acid content has been drastically declined.

95. Assessment of nutritional state of professional soldiers in the Armed Forces of the Czech Republic in view of new regulation about evaluating the health capability of active-duty service

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Introduction: In the Armed Forces of the Czech Republic we used for a long time only BMI criterion for nutritional state assessment according to regulation No 103/2005 Sb. about evaluating the health capability of active-duty service. From the end of 2016 there is new regulation, which added waist circumference to evaluation criteria. Aim of our work was to evaluate nutritional state of soldiers according to new regulation No 357/2016 Sb. **Methods:** The soldiers were examined by military physicians within the Programme of extended preventive care. The examinations are compulsory for all professional soldiers at the age of 25, 30, 33, and 36 years. From the age of 39, these examinations are carried out every year till the end of their career. Besides taking personal histories, carrying out standard physical examinations and blood samples for a biochemical examination of saccharide, lipid and protein metabolism and liver enzymes, the following anthropometric parameters are monitored: body constitution using Body Mass Index (BMI) and waist circumference. **Results:** In 2015 were examined 9,009 of male soldiers and 1,248 of female soldiers with mean age 40.4 ± 6.9 years and 41.0 ± 7.1 years, respectively. BMI was 27.2 ± 3.2 $kg.m^{-2}$ vs. 24.8 ± 5.9 $kg.m^{-2}$. Overweight was found in 58.2 % vs. 26.0 %, obesity in 17.0 % vs. 12.1 %. Waist circumference in the range of 94–102 cm for men and in the range of 80–88 cm for women (risk I) was found in 25.7 % and 17.8 % and waist circumference ≥ 102 cm for men and ≥ 88 cm for women (risk II) was found in 15.4 % and 22.1 %. Overweight along with risk I waist circumference had 19.6 % of men and 10.3 % of women. Obesity along with risk II waist circumference had 10.7 % of men and 10.7 % of women too. **Conclusion:** There is significant difference between prevalence of overweight and obesity according to BMI and waist circumference parameter at professional soldiers. Waist circumference is important parameter for evaluating of nutritional state especially at male soldiers. Waist circumference is able to complete the BMI values and better distinguish individuals with the risk of development of obesity and associated complications from physically fit individuals with increased body weight due to well-developed musculature.

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96. Three months aerobic–strength training and nutritional preference in relation with functional status, metabolism and cognitive functions in seniors with mild cognitive impairment

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Introduction: Prevalence of Mild Cognitive Impairment (MCI) in 65 years old Europeans is approximately 6 % and it increases with age. Active lifestyle and healthy diet could protect from ageing-associated cognitive decline. **Aim:**

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To explore the effects of (i) 3-months combined aerobic-strength training and (ii) food preference on functional status, metabolism and cognitive functions in healthy seniors (controls; 2M/5F) and seniors with MCI (2M/11F). **Methods:** Twenty individuals (age 72 ± 5 yrs) underwent phenotyping before/after intervention. Body composition (bioimpedance; Omron), Resting Metabolic Rate (RMR, indirect calorimetry), glucose tolerance (oral glucose tolerance test) and cognitive functions (Adenbrook's Cognitive Examination, ACE-R; computerized MemTrax test) were assessed. Physical activity (Baeck questionnaire, accelerometers) and food preference (questionnaire) were assessed and skeletal muscle index (SMI) was calculated. Physical fitness (VO_2max, Rockport Walk Test), muscle strength (dynamometry) and muscle performance (10 m Walk Test – max/preferred speed, 10-MWT/M/P; Chair Stand Test, CST) were measured. **Results:** Three months training improved functional capacity (10MWT/P, controls $p = 0.03$; MCI $p < 0.001$), 10MWT/M (MCI $p = 0.02$), CST (controls $p = 0.02$; MCI $p = 0.01$) with no change in body composition, BMI, glucose tolerance and RMR ($p > 0.05$). Cognitive functions improved specifically in MCI group (ACE-R: total score, $p = 0.01$; ACE-R: memory, $p = 0.01$). MemTrax reaction time improved in both groups ($p < 0.001$) and it was associated with 10MWT/P ($r = 0.78$; $p < 0.01$) and CST ($r = 0.68$; $p < 0.01$). No effect of intervention on nutritional preference was observed. Interestingly, we observed lower fat preference score in MCI individuals compared to controls ($p = 0.05$). High protein score was associated with muscle strength (knee flexion; $r = 0.37$; $p = 0.02$) and 10MWT/P ($r = 0.5$; $p < 0.01$). High fat/high simple sugar score was negatively associated with fasting insulin ($r = -0.45$; $p < 0.01$). Negative correlation was observed between fasting and 2-hour insulin and SMI ($r = -0.64$; $p < 0.001$ and $r = -0.4$; $p = 0.02$ resp.). **Discussion:** Three months of regular aerobic-strength training improved functional capacity and cognitive functions in seniors, cognition being improved especially in seniors with mild cognitive impairment. Food preference was associated with muscle strength, motor and metabolic parameters, supporting its impact on metabolic health, functional state and cognitive functions.

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97. STOB activities focused on weight reduction and maintenance with respect to the motivational readiness of patiens

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Introduction: Primary health care alone cannot take long-term care of obese and overweight people. Patients' organizations therefore represent a very important part of obesity management in the Czech Republic. STOB is one of the patients' organizations involved in weight management counselling. **Methodology:** Theoretical ground – STOB works with patients´ motivational readiness to change. People with a lower level of motivation have materials based on motivational interviewing at their disposal. Methodology for higher levels of motivation is based on the principals of cognitive-behavioural therapy and mindfulness. Programs of STOB are focused on a clearly defined specific problem concerning an eating habit, inappropriate or no movement habit, and a psychological problem resulting in eating extra food contrary to a plan. Methodology in the field of nutrition covers not only a problem of what patients eat but also how and why they eat. **Form of influence:** Besides direct impact employed especially within healthy weight reduction courses, STOB influences tens thousands of people "in distance" through printed materials and during last 7 years also through the internet. STOB materials help also to hundreds of specialists within their quick interventions. **Specific materials:** Printed materials for prevention and therapy of obesity will be presented in a real form. You will be acquainted with a set of self-help materials I Want a Change. Internet programs Self-coaching consisting of food-coaching, fit-coaching and psycho-coaching, the system of "traffic lights" offering an immediate feedback will be presented. Psychological video-course Tailored Weight Reduction with STOB consisting of 80 videos based on CBT principles and mindfulness will be mentioned. For maintenance of weight loss a methodology in a form of booklet How to maintain a weight loss and an internet programe Healthy Year (regular week challenges or tasks, motivational competitions, individual motivation and professional advice and other tools) will be presented. **Results:** Via courses of a healthy weight reduction and a methodology of a short intervention provided by professionals STOB has an impact on several thousand people a year. STOB offers help also "in a distant way" via self-help handbooks and especially through internet programs. Due to programe self-coaching (www.stoblub.cz) clients lost 120,000 kg during 7 years. A programe Healthy year brought more than 6,000 clients not only to an increase in education but also to actual change of their habits. **Conclusion:** STOB methodology offers programs with active participation, self-help handbooks and internet programs. STOB helps people not only to acquire knowledge but also to transfer it into real life situations. The activities involve not just weight reduction but mainly maintenance of a weight loss. Practical materials help patients themselves but they spare time also for

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professionals using materials for a short intervention provided to patients. Activity of organization STOB focuses on programs addressing many people at low cost.

98. The effect of mexiletine on body weight in type 2 diabetes patients with visceral obesity

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Background and Aims: Visceral fat develops insulin resistance which is a major cause of type 2 diabetes. Reducing visceral fat results in ameliorating metabolic parameters, and eventually decreasing the risk of cardiovascular events. Mexiletine is an anti-arrhythmic agent used for treatment of painful diabetic neuropathy. In the present study, the effect of mexiletine on body weight was evaluated in type 2 diabetes patients with visceral obesity. **Methods:** Type 2 diabetes patients with neuropathy exhibiting visceral obesity (n = 19) treated by mexiletine (300 mg/day), and a control group of type 2 diabetes patients in the same condition who received vitamin B12 (n = 12) were retrospectively evaluated for 6 months. Body weight, waist circumference, HbA_{1c}, blood pressure, liver function, kidney function, serum lipids and serum uric acid were assessed monthly for 6 months after the treatment. **Results:** Mexiletine significantly decreased body weight (from 79.5 ± 3.9 to 77.9 ± 3.8 kg, $p < 0.05$) and waist circumference (from 99.1 ± 2.4 to 97.6 ± 2.4 cm, $p < 0.05$). The change in body weight and waist circumference in 6 months in the mexiletine group was greater than in the control group (BW: mexiletine 1.6 ± 0.5, control 0.4 ± 0.8 kg, $p < 0.05$, WC: mexiletine 1.6 ± 0.5, control 0.4 ± 0.4 cm, $p < 0.05$). In the metabolic parameters, there was significant decrease in triglyceride (from 138 ± 21 to 116 ± 18 mg/dl, $p < 0.05$) and serum uric acid (from 5.2 ± 0.3 to 4.6 ± 0.2 mg/dl, $p < 0.05$). HbA_{1c} decreased from 6.31 ± 0.21 to 6.16 ± 0.15 %. There were no changes in other parameters. Two patients dropped out the study because of epigastric discomfort. **Conclusion:** Mexiletine may have an effect on body weight regulation. It may decrease body weight resulting in reduction of waist circumference, and may possibly ameliorate metabolic parameters by reducing visceral fat in type 2 diabetes patients. Further study should be carried out to clarify the mechanism of the effect.

99. Self-perceived fatigue and physical performance in Flemish school children

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Introduction: Overweight and obesity are increasing in school children. These conditions are often related to an excess caloric intake but also due to increased sedentary behaviour. It was shown that obese adolescents experienced higher levels of fatigue compared to normal weight peers. The aim of this study was to determine the effect of physical activity on self-perceived fatigue and the influence of body composition on these parameters. **Methods:** Adolescents following a technical and professional curriculum (N = 597) were assessed during physical education lessons for self-perceived fatigue (SpF; MFI-20), body composition parameters (BCP; using DXA), activity level (AL; Backe questionnaire) and physical performance (PP; grip performance and Cooper-test). **Results:** No significant differences were found for age and length between the normal weight, overweight and obese pupils. Weight, BMI, fat (expressed in kg and %) and absolute lean mass were highest in obese followed by overweight and normal weight. Total Fatigue and all sub-scales were affected by sport Index, fat mass and less for body weight. General, physical fatigue and reduced motivation were affected by sex. **Conclusion:** Weight status did not influence sport index or visa versa, but increased school/work index did. Encouraging pupils to be more physical active to lower SpF would be favourable. Since higher work load (curricular or extra) was related with higher fatigue and fat mass, schools offering a technical and professional curriculum must be aware of this negative effect. Further research is necessary to verify whether school or extra curriculum work has the higher impact on fatigue and a possible effects on school results.