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Differences in eating habits and body composition in preschool children according to migrant and socioeconomic status

Author/Address of the institution:

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Background/Introduction:

Changes in nutrition contribute to the increased prevalence of childhood obesity, which is especially pronounced in children from migrant and/or low socioeconomic status (SES). However, little is known about the role of migrant status and SES on eating habits and body composition in young children. Therefore, our objective was to assess differences in eating habits and body composition in preschool children according to their migrant status and their SES.

Methods:

Forty kindergarten classes in SG and VD were randomly selected. 655 out of 727 children had an informed consent. Of those, 587 (mean age ± SD of 5.1 ± 0.6 years, 51% girls) filled out a food frequency questionnaire (FFQ) and 542 (with 71% of migrant background[1] and 63% of low SES[2]) had a complete data set. The semi-qualitative FFQ contained questions about eating habits and assessed the intake of different food categories. For the analysis of the FFQ, we summed up the answers to the questions that corresponded to 5 messages (and their detailed components) developed by the Swiss Society for Nutrition and based on factors implicated in the increase and prevention of childhood obesity: 1."drink water" (1a drinking water and 1b decreasing the intake of sweet drinks), 2."eat fruit and vegetables" (2a eating fruit and 2b vegetables) 3."eat regularly" (decreasing breakfast skipping), 4."make clever choices" (4a reducing fatty and 4b sweet foods), 5."turn your screen off when you eat" (5a reducing the consumption of main meals and 5b snacks in front of TV). Body composition was assessed by 4-polar bioelectrical impedance and cardiorespiratory fitness (CRF) by the maximal multistage 20m shuttle run test. The differences found in migrant status were adjusted for SES status and vice versa to tease out their independent effects.

Results:

Migrant children had a higher weight, body fat, BMI and percent body fat compared to non-migrant children. The differences in the former two were slightly reduced when adjusted for differences in height. Compared to children from medium/high SES, the higher total and percent body fat in low SES children was eliminated after adjustment for migrant status. Both migrant and low SES children had more sedentary behaviours, while CRF was higher in migrant and lower in low SES children. Both migrant and low SES children consumed daily less fruit, more fatty foods and ate more often snacks and main meals in front of TV compared to the other counterparts. In addition, children from low SES had also a lower daily consumption of water and vegetables. The higher BMI and body fat in migrants was explained by the 5 messages, differences in height and SES and, in case of BMI, also by the 5 messages by themselves. For the children from low SES, differences in body fat were explained by the 5 messages.

Discussion:

Differences in eating habits and body composition in preschool children hint to an important role of both migrant status and SES, even at this young age. Our findings might help to explain the current increases in adiposity in those groups.

[1]Defined as at least one parent born outside of Switzerland.
[2]Defined as at least one parent with no education beyond obligatory school (9 years).

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Glucose Excursions in Type 1 Diabetes during Aerobic Exercise using Energy Bars compared with a Hydration Backpack System

Author/Address of institution:

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4 Division of Endocrinology, Diabetes and Clinical Nutrition, University Hospital Bern, Switzerland

Background/Introduction:

The performance of physical exercise imposes high demands on patients with type 1 diabetes mellitus. On one hand, exercise is known to have a beneficial impact on cardiovascular risk factors as well as to improve life expectancy and quality of life in these patients and is, therefore, recommended by treatment guidelines. On the other hand, exercise has been shown to increase the risk of hypoglycaemia and bears the risk of deteriorating diabetes control due to complex interference with the regulation of glucose transport into working muscle. In the present study we assessed whether the range of glycemic excursion could be reduced by using a Hydration Backpack System (HBS, CamelBak ©) compared with conventional energy bars (EB).

Methods:

Participants of a 3-days' seminar focussing on exercise-specific problems in type 1 diabetes were offered exercise testing using a modified Bruce protocol on an electrically breaked bicycle. During the seminar participants twice performed an identical aerobic exercise (2 h of mountain bike) aiming at a workload of 90% of the aerobic threshold. Glucose was monitored using a continuous glucose monitoring system (Medtronic Paradigm RT, Medtronic Switzerland). In random order participants once used HBS and were advised to drink 4 gulps of a solution containing 8% of glucose (PowerBar Energize Drink ©) every 5 minutes. On the other occasion participants were offered 2 energy bars (EB) containing the identical amount of carbohydrates (40g, PowerBar Energize ©) before and after 60 min of exercise. The amount of carbohydrates (gulps or bars) was adapted according to the trends given by the CGMS system.

Results:

From 21 participants of the seminar, 4 had to be excluded for the analysis: one had type 2 diabetes and 3 had sensor failures during exercise. Thus, 17 Participants (4 women, 13 men) were included into the analysis. 8 had a continuous insulin infusion system. Mean age±SD was 39.7±12.2 y, BMI was 25.5±2.8 kg/m2, diabetes duration was 12.1±6.8 y, HbA1c was 6.3±0.4%, VO2max was 49.3±5.7 ml/kg/min. Glucose levels were comparable before exercise using HBS and EB and this was also true after exercise (6.7±0.4 vs. 6.6±0.5 mmol/l with HBS and EB, respectively, n.s.). Peak glucose values were similar: 8.4±0.6 vs. 8.7±0.7 mmol/l with HBS and EB (n.s.), and minimum glucose was identical using HBS and EB (5.7±0.4 mmol/l in both cases, n.s.).

Conclusion:

In this real-life setting in well-controlled patients with type 1 diabetes the use of a Hydration Backpack System and the use of conventional energy bars resulted in similar glucose levels during moderate intensitiy aerobic exercise.

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Ebenegger Vincent, Institute of Sports Sciences and Physical Education, University of Lausanne, Bâtiments administratifs de Vidy, Route de Chavannes 33, CH-1015 Lausanne

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Changes in nutrition contribute to the increased prevalence of childhood obesity, which is especially pronounced in children from migrant and/or low socioeconomic status (SES). However, little is known about the role of migrant status and SES on eating habits and body composition in young children. Therefore, our objective was to assess differences in eating habits and body composition in preschool children according to their migrant status and their SES.

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Discussion:

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Growth Hormone Deficiency (GHD) and the "Insulin Resistance Syndrome": A Problem of Matching Control Subjects?

Author/Address of institution:

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Background/Introduction:

Early observations suggested that patients with growth hormone deficiency share some features of the metabolic syndrome, which may explain the observed increased risk for cardiovascular disease in these patients. However, in previous studies, most of the control subjects were matched for age, gender and BMI. Visceral adiposity, often found in GHD patients, was not accounted for when selecting the controls subjects. The aim of this study was to compare the parameters of the metabolic syndrome (according to ATP III) in GHD patients with matched controls subjects (incl. matching of waist). In addition, insulin resistance was assessed by the gold standard method.

Methods:

10 patients and 10 healthy volunteers were recruited. We investigated clinical and biochemical features of the metabolic syndrome. Hepatic and peripheral insulin sensitivity, was assessed by a two step hyperinsulinemic euglycemic clamp. Endogenous Glucose production was determined by administration of a stable isotope (Glucose 6,6 H2). Differences in outcomes were tested using paired t-test or Wilcoxon signed rank test where appropriate.

Results:

Patients and matched controls did not show any significant clinical differences; age (years: (patients vs. controls, mean±SD, p-value); 42.4±12.6 vs. 42.8±12.7, p=0.7,) gender (4 females in both groups), BMI (kg/m2 26.6±3.8 vs. 25.3±5.3, p=0.12), waist (cm : 89.3±12.9 vs. 90.7±19.1, p=0.88). The two groups did not show a significant difference in lipid profile or blood pressure. Two patients and two control subjects fulfilled the criteria for the metabolic syndrome (ATP III).
IGF-1 levels were significantly lower in GHD (ng/ml: 66.1±24.3 vs. 117.1± 30.5, p=0.006). Fasting blood glucose and insulin levels were significantly lower in GHD (Glucose mmol/L: 4.43±0.34 vs. 4.8±0.33, p=0.035; Insulin mU/ml: 4.7 ±3.6 vs. 8.7± 5.5, p=0.013). GHD patients showed significantly lower fasting endogenous glucose production compared to controls (mg/kg/min: 1.4± 0.2 vs. 1.6±0.3 p=0.036). During low dose insulin clamp the groups did not differ neither regarding total Rate of appearance (mg/kg/min: 2.5±0.3 vs 2.7±0.9, p=0.27) nor regarding mean endogenous glucose production (mg/kg/min: 0.6±0.7 vs. 0.9±0.4, p=0.4). M-Value during high dose insulin clamp was also comparable (mg/kg/min: 7.1±1.4 vs. 7.4±2.8,p=0.7).

Conclusion:

This study could not confirm an increase in the features of the metabolic syndrome in hypopituitary patients with GHD. In contrast, compared to matched control subjects, GHD showed significantly lower fasting insulin and glucose levels in parallel with lower baseline glucose production. Possible explanations for these controversial findings include 1) an influence of the matching parameters of the control subjects in previous studies (i.e. waist); 2) a significant impact on the parameters of the

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Comparison of Bio Impedance Analysis and a Magnetic Resonance Based Volume Estimation Method in Healthy Subjects and in Hypopituitary Patients with Growth Hormone Deficiency Before and After Therapy

Author/Address of institution:

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1Division of Endocrinology, Diabetes & Clinical Nutrition, Inselspital, Bern University Hospital, and University Bern, Switzerland
2 Department of Clinical Research, MR Spectroscopy and Methodology, University Bern, Switzerland

Background/Introduction:

There are several methods for the quantification of body fat. We compared estimation of fat mass using the clinically widely used Body Impedance Analysis (BIA) and a Magnetic Resonance Imaging (MRI) based on a volume estimation method. BIA measurements depend on body water content whereas MRI assesses visceral fat mass (VAT) and subcutaneous fat mass visually. Growth hormone replacement therapy (GHRT) has shown to decrease fat mass and increase lean body mass. The aim of the study was to compare the two methods in patients and in control subjects.

Methods:

Whole body fat mass was measured in 12 growth hormone deficient (GHD) patients before and after 6 months GHRT and in 17 healthy control subjects with a broad range of BMI. BIA was measured in the fasting state after voiding. MRI based fat quantification was carried out using a clinical 3 Tesla MR whole body system. The analysis was performed by a combined approach based on a threshold method, which is manually corrected for intensity variations. We assumed a specific weight of 1.00762 for lean body mass (LBM) and 0.9206 for fat mass.

Results:

Control subjects: BIA: mean total body fat mass (TBFM) was 19.1±8.7 kg, LBM was 54.7±11.3 kg. MRI: mean TFBM was 16±8.7 kg, LBM was 53.4±12.1 kg. The significant correlation between the two methods showed a R2 of 0.92 for TBFM and R2 0.96 for LBM.
GHD: BIA: TBFM was 23.9±7 kg and LMB was 50.1±8.8 kg. MRI: TBFM was 20.14±7 kg and LBM 49.7±9.3 kg. The significant correlation showed a R^2 of 0.58 for TBFM and of 0.69 for LBM.
GHRT: According to BIA, GHRT resulted in a significant decrease in TBFM (mean decrease 4.6±3.6 kg, p=0.0009) and an increase in LBM (mean increase 3.15±3.8 kg, p=0.016). MRI measurement also showed a significant, although less pronounced decrease in TBFM (mean decrease 2.34±2.35 kg, p=0.005) and a significant increase in LBM (mean increase 1.5±2.3 kg, p=0.04). R^2 was 0.64 for TBFM and 0.81 for LBM.
GHRT lead to a significant decrease of both VAT (% decrease -14±15, p=0.022) and subcutaneous adipose tissue (SCAT) (% decrease -11±10, p=0.006).
BMI, weight and waist did not significantly change in the patients following GHRT.

Conclusion:

1) BIA measurements appears to overestimate TBFM in patients and controls.
2) The correlation of the two methods was less pronounced in the patients, possibly due to the changes in hydration state in GHD patients before and after GHRT.
3) Measuring total body fat mass, VAT and SCAT on a 3 Tesla MRI, combining a threshold method with manual corrections for intensitiy variation, seems to be a valid though expensive method.

Jahresversammlung
Assemblée annuelle

2009

19. - 21. November 2009
le 19 à 21 novembre 2009

Inselspital Bern

Schweizerische Gesellschaft für
Endokrinologie und Diabetologie - SGED

Société Suisse d'Endocrinologie
et de Diabétologie - SSED

Update lectures and new issues

Chairpersons: *Kurt Läderach, Dagmar l'Allemand*

14.15 - 14.45 **Obesity as an autoimmune disease? Studies with melanocortin 4 receptor autoantibodies**. *Karl Hofbauer, Basel*

14.45 - 15.45 **The intestinal flora in obesity and its metabolic complications.**

Does it play a role in energy balance of human subjects?
Yves Schutz, Lausanne

Is there a link between the intestinal flora and obesity/metabolic syndrome?
Jason Chou, Vevey

15.45 - 16.00 Break with Coffee and Juice

Research Communications

Chairpersons: *Abdul Dulloo, Vittorio Giusti*

16.00 - 16.15 **Abstract 1 - Fructose consumption and its association to metabolic characteristics in healthy men**

Isabelle Aeberli, Manfredi Rizzo, Valeria Meyer, Cornelia Zwimpfert, Giatgen A. Spinas, Kaspar Berneis; Zürich

16.15 - 16.30 **Abstract 10 - Differences in eating habits and body composition in preschool children according to migrant and socioeconomic status**

V. Ebenegger, P. Marques-Vidal, A. Nydegger, I. Niederer, F. Bürgi, J. Laimbacher, V. Giusti, S. Kriemler, J.J. Puder; Lausanne, Basel, St. Gallen

16.30 - 16.45 **Abstract 24 - Metformin and the magic of medicine: Placebo and metformin both improve components of the metabolic syndrome. A randomized placebo controlled trial in 70 obese adolescents**

D. l'Allemand, H. Hübel, M. Bürmann, P. Martus, Holl, A. Grüters, J. Laimbacher, S. Wiegand; St. Gallen, Berlin, Ulm

16.45 - 17.00 **Abstract 61 - ER stress in 3T3-L1 adopocytes inhibits insulin signalling and alters the secretion of adipokines without inhibiting glucose transport**

Linhua Xu, Giatgen A. Spinas and Markus Niessen; Zürich

17.00 - 17.15 **Abstract 62 - Expression of the N-terminal fragment of RasGAP in pancreatic beta cells increases their resistance to stresses and protects mice from diabetes**

Jiang-Yan Yang, Joël Walicki, Evrim Jaccard, Gilles Dubuis, Natasa Bulat, Jean-Pierre Hornung, Bernard Thorens, and Christian Widmann; Lausanne

17.15 - 17.25 Short Break

Obesity epidemic and the public

Chairperson: *Anne Laurent-Jaccard.*

17.25 - 17.55 **Fighting the obesity epidemic in Switzerland. Current strategies (GO and NGO)** *Heinrich von Grünigen, SAPS; Zurich*

18.00 End of the scientific ASEMO meeting

18.00- 18.40 General Assembly of ASEMO for members