

TRACK 1

HTOP 001

INVESTIGATION OF ADIPOCYTE PROTEOME DURING THE DIFFERENTIATION OF BROWN PREADIPOCYTES

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Introduction

Brown adipocytes oxidize fatty acids to produce heat in response to cold or caloric overfeeding. The motivation and function of the development of brown fat may thus counteract obesity, though this remains uncertain.

Methods

We investigated the brown adipocyte proteome by two dimensional gel electrophoresis followed by mass spectrometry. Comparative analyses of proteins focused on total protein spots to filter differentially expressed proteins during the differentiation of mouse primary brown preadipocytes. A Western blot analysis was performed to verify the target proteins.

Results

The results indicated that 10 protein spots were differentially expressed with significant changes, including the three up-regulated proteins of prohibitin, hypoxanthine–guanine phosphoribosyltransferase, and enoyl-CoA hydratase protein; the 5 down-regulated proteins of triosephosphate isomerase, elongation factor 2, α -tropomyosin slow, endophilin-B1, and cofilin-1 (CFL1); and the two unequivocally expressed proteins of peroxiredoxin-1 and collagen α -1(i) chain precursor. We found that during brown adipogenesis, CFL1 has an inhibitory effect on brown adipocyte differentiation. The overexpression of CFL1 inhibited the brown fat deposition and repressed the brown marker genes UCP1, PRDM16, PGC-1 α and PPAR γ via actin dynamics and polymerization.

Conclusion

These observations may be novel findings that bring new insight into the detailed mechanisms of brown adipogenesis and identify possible therapeutic targets for anti-obesity.

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Conclusion: These observations may be novel findings that bring new insight into the detailed mechanisms of brown adipogenesis and identify possible therapeutic targets for anti-obesity.

Presented by: Kim, Won Kon W.K.K.

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None Disclosed

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HTOP 002

ENHANCEMENT OF BROWN FAT THERMOGENESIS USING CHENODEOXYCHOLIC ACID IN MICE

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Introduction

Methods

Results

Conclusion

Besides their role in lipid absorption, bile acids (BAs) can act as signalling molecules. The effects of the natural BA, chenodeoxycholic acid (CDCA), on dietary obesity, UCP1 in both interscapular BAT and in white adipose tissue (white cells in WAT), were characterized in dietary-obese mice. To induce obesity and associated metabolic disorders, male 2-month-old C57BL/6J mice were fed cHF (35% lipid wt wt-1, mainly corn oil) for 4 months. Mice were then fed either (i) for 8 weeks with cHF or with cHF with two different doses (0.5%, 1%; wt wt-1) of CDCA (8-week reversion); or (ii) for 3 weeks with cHF or with cHF with 1% CDCA, or pair-fed (PF) to match calorie intake of the CDCA mice fed ad libitum. In the 8-week reversion, the CDCA intervention resulted in a dose-dependent reduction of obesity, dyslipidaemia and glucose intolerance, which could be largely explained by a transient decrease in food intake. The 3-week reversion revealed mild CDCA-dependent and food intake-independent induction of UCP1-mediated thermogenesis in interscapular BAT, negligible increase of UCP1 in subcutaneous WAT and a shift from carbohydrate to lipid oxidation. CDCA-dependent and food intake-independent induction of UCP1 in BAT (but not in WAT) could contribute to the reduction in adiposity and to the stabilization of the lean phenotype.

Presented by: Palmeira, C.M.

ID: 675

None

EXPRESSION OF VITAMIN D RECEPTOR AND METABOLIZING ENZYMES IN HUMAN ADIPOSE TISSUE – THE INFLUENCE OF FAT MASS AND INFLAMMATION

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Introduction

Vitamin D deficiency commonly occurs in obese subjects. Vitamin D is suggested to be anti-inflammatory in adipose tissue. We hypothesized that vitamin D signalling in adipose tissue is altered in obesity. We investigated (1) VDR (Vitamin D receptor), CYP27B1 (25-hydroxyvitamin D₃ 1 α -hydroxylase) and CYP24A1 (1 α ,25-dihydroxyvitamin D₃ 24-hydroxylase) expression in human subcutaneous and visceral adipose tissue (SAT and VAT), (2) whether their expression was influenced by body fat and inflammation.

Methods

SAT and VAT from 15 obese subjects (Age:42.1 \pm 11.3 year, BMI:38.7 \pm 6.7) were analysed for protein expression of VDR, CYP27B1 and CYP24A1 by western blotting. Body fat, serum vitamin D, lipids and CRP were determined. The effect of inflammation on VDR, CYP27B1 and CYP24A1 expression was studied *in vitro*, using human primary adipocytes treated with THP-1 macrophage-conditioned (MC) media.

Results

All subjects had low vitamin D (25-Hydroxyvitamin D₃<20ng/ml). VDR, CYP27B1 and CYP24A1 were expressed in adipose tissue, and VDR and CYP24A1 expression was higher in SAT than in VAT (57%, P=0.04; 33%, P=0.02). Body fat, serum cholesterol and LDL were inversely associated with CYP27B1 expression in SAT (r=-0.73, P=0.01; r=-0.86, P=0.002; r=-0.68, P=0.03). Serum CRP negatively correlated with VDR in VAT (r=-0.77, P=0.009). *In vitro*, MC media decreased CYP27B1 (1.7-fold, P=0.019) but enhanced VDR (4-fold, P=0.002) protein expression in adipocytes.

Conclusion

Adipose tissue as a target of vitamin D could also metabolize vitamin D locally. Whilst low vitamin D could be pro-inflammatory, it is also possible that altered metabolism of vitamin D might contribute to lower circulating vitamin D in obesity.

Presented by: Ding, C

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TRACK 2

HTOP 004

FOOD INSECURITY AND OVERWEIGHT AMONG DUTCH FOOD BANK RECIPIENTS

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Introduction: Food insecurity and overweight might seem paradoxical but are important problems in high-income Western countries. However, in Europe objective prevalence data on food insecurity combined with overweight are scarce. The aim of this study was to determine the prevalences of food insecurity and overweight among Dutch food bank recipients.

Methods: In 2010/11 a cross-sectional study was carried out among 245 food bank recipients from 11 food banks in the Netherlands. Food insecurity in the past 3 months was measured using a translated version of the US Household Food Security Survey Module. Overweight was based on self-reported height and weight and defined according to the WHO-criteria.

Results: The prevalence of food insecurity was 73.5% (N=180), of which 48.9% (N=88) with very low food security. Of the very low food secure participants, 46.6% (N=41) reported that they were hungry and could not eat enough because they could not afford buying food in the past 3 months. Mean BMI was 27.3 kg/m² (range: 16.2-52.2 kg/m²) and the prevalence of overweight and obesity were 28.6% (N=70) and 28.2% (N=69). The prevalence of obesity is 2.4 times higher than the national prevalence rate in 2013 (11.9%).

Conclusion: Our study showed high prevalences of food insecurity and overweight among Dutch food bank recipients. More research is urgently needed to determine the underlying determinants of food insecurity, the high prevalence of overweight in food insecure people and the effectiveness of food assistance by food banks.

Presented by: Neter, Judith J.E.

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TRACK 3

HTOP 005

THE INFLUENCE OF FAMILIAL PREDISPOSITION TO CARDIOVASCULAR COMPLICATIONS UPON CHILDHOOD OBESITY TREATMENT

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Introduction

The aim of this study was to investigate whether familial predisposition to obesity-related complications is associated with the degree of obesity at baseline, and changes in BMI-SDS during a multidisciplinary childhood obesity treatment program.

Methods

The study included 1421 obese children (634 boys) with a median age of 11.5 years (range 3.1-17.9 years), enrolled in treatment for one to six years (median 1.3 years) at the Children's Obesity Clinic. At baseline, weight and height were measured, BMI-SDS calculated, and self-reported information about familial predisposition to obesity, hypertension, T2DM, thrombosis, and dyslipidemia were obtained. Familial predisposition encompassed biological parents, siblings, grandparents, uncles and aunts. The treatment outcomes were categorically analyzed according to familial predisposition.

Results

The median BMI-SDS was 3.2 in boys and 2.8 in girls. 1041 children had obesity in their family, 773 had hypertension, 568 had thrombosis, 551 had T2DM, 538 had dyslipidemia, and 733 had 3 or more predispositions. At baseline, familial T2DM was associated with a higher BMI-SDS ($p=0.03$), but no associations were found between the other predispositions and the children's degree of obesity. After one year, girls with familial obesity lost more weight, compared to girls without familial obesity ($p=0.04$). Other familial predispositions were not associated with changes in BMI SDS during treatment.

Conclusion

Obese children with familial predisposition to T2DM showed a significantly higher degree of obesity at baseline, and girls with familial obesity responded significantly better to treatment.

HTOP 006

THE METABOLIC SYNDROME AND INSULIN SENSITIVITY IN LEAN AND OBESE CHILDREN

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Introduction

Accumulation of specific components of the metabolic syndrome (MetS) may be associated with reduced insulin sensitivity, even among children. This study aimed to reveal the possible associations between MetS severity and insulin sensitivity in lean and obese children.

Methods

We administered a 2-hour oral glucose tolerance test (2h-OGTT) to 78 children, aged 7-17 years. Forty-two children were obese and enrolled in a multidisciplinary childhood obesity treatment program, whereas 36 were age- and gender-matched control children. Insulin sensitivity was assessed at 0 and 120 minutes by plasma glucose, the homeostasis model of assessment (HOMA) and insulinogenic index. The severity of MetS was assessed at baseline according to the International Diabetes Federation (IDF) criteria.

Results

The median BMI-SDS in the obese children was 2.9 (range 2.1-4.4) and 0.1 (-0.6-0.9) in the control group. The 78 children were allocated to one of three groups according to the number of components of MetS: Low MetS risk ($n=39$), high MetS risk ($n=32$), and MetS ($n=7$). The Kruskal-Wallis test

showed that a higher degree of MetS was associated with a lower insulin sensitivity when analyzing both plasma glucose ($p=0.03$ and $p=0.02$ at 0 and 120 minutes, respectively), HOMA ($p<0.0001$ at 0 and 120 minutes), and the insulinogenic index ($p<0.0001$).

Conclusion

We found, that children burdened by more components of the metabolic syndrome exhibited a decreased insulin sensitivity, regardless of reaching the IDF criteria for the metabolic syndrome or not. Presented by: Fonvig, Cilius E. C.E.

ID: 690

All authors declare no conflicts of interest.

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HTOP 007

DIETARY INTERVENTION IN GROUP OF OBESE CHILDREN IN PREPUBERTAL AGE

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Introduction

The aim of the study was to analyse the energy value and the nutritional value of diets of obese children who are subject to dietary intervention, paying particular attention to the group with no body weight reduction observed.

Methods

The study covered 125 children aged 5-10 years, with diagnosed simple obesity. In order to be included in the study, the children had to have a body mass index BMI exceeding 2SD and had to follow a low-energy diet of 1200-1400 kcal per day for 12 weeks.

Results

The evaluation of the nutritional status of these children showed satisfactory pace of body weight reduction (≥ 0.25 kg per week) in 36,8% of the children (subgroup I) and a slower than expected pace of body weight reduction (<0.25 kg per week) in 44,0% of the children (subgroup II), while there was no effect in body weight reduction in 19,2% of the children (subgroup III). The interviews and review of randomly selected 3-day diet records from the food diary allowed to establish that during the dietary intervention a low-energy diet of 1200 kcal per day is effective in reducing body weight in pre-pubertal children, whereas the lack of treatment effects may be related to the excessive consumption of products rich in sucrose (beverages, sweets) and fat that results in higher energy intake than recommended 1200-1400 kcal per day.

Conclusion

A low-energy diet of 1200 kcal in dietary intervention was effective and safe in reducing body weight in obese pre-pubertal children.

Presented by: Weker, H.W.

ID: 704

Authors declare no conflict of interest

HTOP 008

TRACK 4

ASSESSING SCHOOL FOOD POLICIES ACROSS THE EU28 PLUS NORWAY AND SWITZERLAND

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Introduction

With childhood obesity prevalence on the rise in many European countries, schools may serve as a protected environment for children to learn healthy diet and lifestyle habits. Policymakers and researchers would benefit from a comprehensive overview of European school food policies.

Methods

We screened public databases, EU level reports, national ministerial websites and the scientific literature to collate official school food policies across Europe. Member States representatives checked that all appropriate documents (total of 34 policies) had been identified and referenced, and they reviewed and confirmed the extracted data.

Results

Mandatory standards are defined in 50% of the policies, the remainder offering voluntary guidelines. Top 3 policy aims are to improve child nutrition (97%), teach healthy dietary/lifestyle habits (94%) and reduce/prevent obesity (88%). Variations mainly relate to the types of meals targeted (e.g. lunch, breakfast, snack, dinner); whether standards/recommendations are nutrient- and/or food-based; and if vending machines and the wider food environment (kiosks near schools, packed lunches from home, etc.) are considered.

Conclusion

We provide an up-to-date overview of European school food policies. The next step will be to assess the need and feasibility for developing best practice guidelines for school food policies in Europe, bearing in mind cultural and structural differences between countries. This assessment will be conducted via a workshop designed to understand the challenges faced by different stakeholders and countries in developing, adopting, implementing and monitoring/evaluating school food policies.

Presented by: Storcksdieck genannt Bonsmann, Stefan S.S.g.B.

ID: 667

None

None

HTOP 009

ASSESSING CARDIOMETABOLIC RISK IN MIDDLE-AGED ADULTS USING BODY MASS INDEX AND WAIST-HEIGHT RATIO – ARE TWO INDICES BETTER THAN ONE?

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Introduction

A novel obesity classification method has been proposed utilising body mass index (BMI) and waist-height ratio (WHtR). In this study we compare the metabolic profiles in subjects defined as overweight or obese by both measures. We examine a range of metabolic risk features, pro-inflammatory cytokines, acute-phase response proteins, coagulation factors and white blood cell counts to determine whether a combination of both indices more accurately identifies a higher percentage of subjects at increased cardiometabolic risk.

Methods

This was a cross-sectional study involving a random sample of 2,047 men and women aged 50-69 years. Metabolic and anthropometric profiles were assessed in study participants. Independent *t* or Mann-Whitney U tests were used to compare lipid, blood pressure, glycaemic and inflammatory biomarker levels between BMI and WHtR percentiles. Multinomial logistic regression was performed to determine cardiometabolic feature and biomarker risk factor associations for BMI and WHtR groupings.

Results

When BMI and WHtR percentiles were combined there were clear, significant metabolic variable differences across both overweight and obese groups. Odds ratios for cardiometabolic risk factors were noticeably increased in subjects classified as overweight or obese by both indices when compared to study participants categorised by either BMI or WHtR individually. In obese subjects within the highest BMI and WHtR percentile, the prevalence of high blood pressure, insulin resistance, cardiometabolic feature clustering and pre-diabetes was 81%, 55%, 34% and 17% respectively.

Conclusion

Risk stratification using a composite index may provide a more effective and precise method for identifying high-risk subjects.

Presented by: Millar, Seán S.R.

ID: 696

None disclosed.

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HTOP 010

CALORIE-LABELLING: A REVIEW OF THE LITERATURE

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Introduction

Calorie-labelling has been suggested as an anti-obesity measure, but evidence for its impact is scarce. It might have particular value for young adults, when weight-gain is most rapid. This study aimed to review the current literature published on the topic.

Methods

A systematic literature review was performed on all calorie-labelling publications from 1990-2013. using OVID/Medline databases, with key words 'labelling' and 'calories' or 'calorie-labelling'. Inclusion criteria were: 1) examining the effect of calorie-labelling on meals and snacks, as an individually identifiable intervention, 2) published between 1990-2013. Study quality was assessed using the Scottish Intercollegiate Guidelines Network (SIGN) checklist for critically appraising studies.

Results

Thirteen published studies were identified. All examined the impact of single exposures to calorie-labelling of meals and snacks: Eight studies were observational natural experiments, four were conducted in laboratory settings, and one was a postal survey. Using the SIGN checklist for critical appraisal, none of the studies achieved a 'high-quality' score; nine were 'acceptable' and four of 'poor-quality'. The 'poor quality' studies lacked information on statistical analysis, recruitment methods, non-blinding and lack of control of confounding factors. Four reported small reductions in calories purchased or consumed (12-96kcal), none reported increases in calories purchased or consumed and none assessed the impact of labelling on body-weights.

Conclusion

Calorie-labelling is a low-cost, very visible, intervention, which is easily and increasingly implemented. It generates awareness, but the current evidence only very weakly supports the notion that it may help against weight-gain and obesity.

Presented by: Nikolaou, Charoula CK

ID: 706

None declared

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TRACK 5

HTOP 011

THE STIFFNESS OF ADIPOSE TISSUE IS ASSOCIATED WITH METABOLIC PARAMETERS IN MORBIDLY OBESE PATIENTS

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Introduction

The fibrosis is the hallmark of the pathologic alteration of adipose tissue (AT) during the development of obesity. The relationship between the fibrosis and the changes of AT stiffness needs to be further studied. The AdipoScan™ (Echosens, Paris) is a new non invasive vibration-controlled transient elastography (VCTE) device which measures the velocity of shear wave propagation (Vs) in the AT

related to its stiffness. The aim of the study was to evaluate the relationships among the AT fibrosis, the Vs and the bioclinical characteristics in morbidly obese subjects.

Methods

103 obese candidates for bariatric surgery were recruited (FibroTA study). The stiffness of AT was measured by AdiposScan™ in the periumbilical region before surgery. The bioclinical characteristics were also obtained. During the operation, subcutaneous WAT biopsies were processed for the fibrosis quantification by histochemistry and the AT remodeling gene expression analysis by RT-PCR.

Results

In 86 patients (female 67.4%, age 39.5±10.6 yr, BMI 46.1±6.9kg/m²), the Vs was negatively associated with lean mass% while positively associated with fasting plasma glucose, HbA1c%, systolic blood pressure, ALT, GGT. The Vs in diabetic patients is higher than in non diabetic patients (1.17±0.79m/s VS 0.94±0.37m/s, $p=0.014$). There was a positive correlation between the Vs and the expression of gene involved in collagens cross-linking (LOX) and mechanotransduction (TEAD2 and TEAD4) which suggested a stiffening of the AT.

Conclusion

In conclusion, the AT stiffness measured by AdiposScan™ might be a good non-invasive method to evaluate the fibrosis and comorbidities related to obesity.

Presented by: Liu, Yuejun L.Y

ID: 669

TRACK 6

HTOP 012

ASSOCIATION BETWEEN METABOLIC SYNDROME AND THREE-DIMENSIONAL BREAST DENSITY USING DIGITAL MAMMOGRAPHY

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Introduction

Metabolic syndrome has been associated with an increased risk of breast cancer, but little is known the association between metabolic syndrome and mammographic density, an independent predictor of breast cancer. In this study, we studied the association between metabolic syndrome or its components and three-dimensional breast density using digital mammography.

Methods

We analyzed cross-sectional data from 61 premenopausal and 105 postmenopausal women in district hospital. Metabolic syndrome was defined according to the modified NCEP-ATP III(National Cholesterol Education Program's Adult Treatment Panel III) guideline. We measured percentage of breast density using digital mammography. Stepwise multiple regression analysis was used to estimate the association between mammographic density and metabolic syndrome, as well as its components.

Results

Mean mammographic density was lower in the group with metabolic syndrome compared with non-metabolic syndrome group. In the stepwise multiple regression analysis controlling after age and menopausal status, waist circumference($\beta=-3.112$, S.E.=0.927, $P=0.001$) and low HDL-cholesterol($\beta=-2.967$, S.E.=1.109, $P=0.008$) were found as independent variables for percentage of mammographic density, however, metabolic syndrome itself was not. After additional adjustment with body mass

index, only low HDL-cholesterol was associated with percentage of mammographic density($\beta=-2.953$, S.E.=0.882, P=0.001).

Conclusion

In this study group, only low HDL cholesterol was associated with three-dimensional mammographic density independently after adjusting for age, menopausal status and body mass index. These findings need to be confirmed in further larger prospective studies.

Presented by: Kang, Jee-Hyun JH

ID: 388

