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Duan (China) et al. [1] report on heritabilities of subphenotypes (BMI, waist-hip ratio, fasting plasma glucose, oral glucose tolerance test, total cholesterol, triglycerides, high- and low-density lipoprotein cholesterol, diastolic and systolic blood pressure) of the metabolic syndrome based on 654 twins ascertained via diverse routes. Both univariate and bivariate structural equation models were fitted for the assessment of the genetic and environmental contributions. Intra-pair correlations after adjustment for age and sex were consistently higher in monozygotic than in dizygotic twins. The AE model was selected as the best model for all phenotypes except for triglycerides for which the CE model revealed the best fit. In all the AE models, moderate to high heritability were estimated. The highest and lowest heritabilities were obtained for weight (0.78) and triglycerides (0.5), respectively. Bivariate Cholesky decomposition revealed high genetic correlations between systolic and diastolic blood pressure, triglycerides and low-density lipoprotein cholesterol and modest genetic correlations between BMI and both systolic and diastolic blood pressure.

The AVENA study was designed to evaluate dietary patterns, body composition, lifestyle habits, health indicators and genetic markers in a representative sample of adolescents (13–18.5 years) recruited in 5 Spanish cities between 2000 and 2002. Martinez-Gomez (Spain) and coworkers [2] now report on an analysis comprising 1,310 adolescents, which aimed to assess the effect of four categorically assessed lifestyle variables (physical activity, TV viewing, sleep duration and meal frequency) on diverse anthropometric measures. The number of lifestyle risk factors was positively associated with sum of 6 skinfolds, % body fat, waist circumference and waist-to-height ratio. The odds ratios of overweight/obesity for groups with 1, 2 and 3–4 lifestyle risk factors compared with those with 0 were 2.86, 3.61 and 5.81, respectively. The results proved to be robust upon adjustment for potential confounders. Due to the cross-sectional study design causal inferences cannot be made.

The role of commercial weight management organizations which follow guidance criteria for best practice has increasingly been recognized in the UK. Slimming World has an extensive community-based infrastructure of around 6,700 support groups which convene each week. Stubbs (UK) et al. [3] report on rate and extent of weight loss of 34,271 patients referred to this commercial organization for 12 weekly sessions; the study was funded by Slimming World; four of the five authors are employees of this organization. Upon referral via health care professionals patients received a 12-week voucher pack financed by Primary Care Trusts and National Health Service Trust and subsidized by Slimming World. The aim of the study was to audit and rate extent of weight loss. Average BMI reduction was equivalent to 1.5 kg/m²; the average number of attended sessions was 8.9. Attendance explained 29.6% and initial weight loss during the first week 18.4% of the variance in weight loss. The authors estimate the total costs of the referral scheme at GBP 47.40; they argue that in comparison to drug treatment the cost-effectiveness of their commercial program is superior.

The working group of Viguerie [4] assessed the effect of a massage of the gluteofemoral adipose tissue on gene expression profile and β -adrenergic-mediated lipid mobilization. Adipocytes of this adipose tissue are less metabolically active than visceral adipocytes. 12 healthy females with a mean BMI of 27 kg/m² and a mean waist-to-hip ratio of 0.8 agreed to fat biopsies after an overnight fast before and after the last mechanical massage session. The massage technique was performed by an expert physiotherapist; each subject received a total of twelve 30-min sessions (two times per week) of mechanical massage. The company that markets the commercially available massage device supported funding of the study. 2,259 unique differentially expressed transcripts were identified with changes in expression ranging from 1.2 to 6.9 and from 0.9 to 0.4 for up- and down-regulated genes, respectively (all genes can be looked up online in a supplementary table). Five pathways figured prominently: 'glycerolipid me-

tabolism', 'propranoate metabolism', 'glycolysis/gluconeogenesis', 'citrate cycle', and 'pyruvate metabolism'. Mean values of isoproterenol-induced glycerol output at 1 and 10 μmol were significantly increased when compared to the values obtained before the massage sessions.

CST3 which codes for cystatin C was viewed as a candidate gene for time dependent BMI and other anthropometric variables by Hooton (France) et al. [5]. Two tag SNPs were investigated in the original case-control sample and two replication samples, which in total encompassed almost 6,000 individuals for whom longitudinal data were available. G/G carriers at rs2424577 were less corpulent than A/A carriers in the original French cohort and the Danish replication sample. However, in the second replication sample ascertained in Sweden G/G carriers were heavier. The group considers these opposite effects as an example of a flip-flop effect likely due to a multi locus effect.

Visceral adipose tissue-derived serine protease inhibitor (vaspin) is a novel adipokine that was originally isolated from rat visceral white adipose tissue in 2005. In humans the vaspin gene expression level in the abdominal fat is correlated with circulating vaspin levels; vaspin levels are higher in obesity and type 2 diabetes mellitus. Vaspin levels of patients with polycystic ovary syndrome (PCOS) have previously been assessed in three studies which derived at conflicting results. Koiou (Greece) and coworkers [6] now compared levels of 100 patients that fulfilled the 1990 PCOS diagnostic criteria with those of an equal number of patients fulfilling the 2003 criteria. Vaspin levels were higher in the group of patients diagnosed according to the more strict 1990 criteria implying that patients with PCOS whose symptoms include anovulation and hyperandrogenemia with or without polycystic ovaries have higher serum vaspin levels than both ovulatory women with PCO and hyperandrogenemia and anovulatory women with PCO but normal androgen levels.

Peters (Germany) et al. [7] report on an interventional study designed to investigate whether the brain shrinks after caloric restriction in obese individuals. The group has a track record in pursuing the hypothesis that in comparison to all other tissues the brain allocates the most energy to itself in order to cover its high energy needs. In order to provide further evidence for this hypothesis, Peters and coworkers studied 52 normal-weight and 42 obese adult females before and after approximately 10% weight loss. The masses of diverse organs including the brain were assessed via magnetic resonance imaging, furthermore fat and muscle mass were deter-

mined. Body metabolism was measured by indirect calorimetry. In contrast to the masses of kidney, liver, muscle and fat, brain mass was not affected by weight loss. The authors conclude that i) weight status has no effect on brain mass and ii) that the brain is indeed protected during caloric restriction. On a side note, it should however be noted that upon severe caloric restriction such as in anorexia nervosa imaging studies have repeatedly revealed reversible brain atrophy [8].

Artherosclerosis is widely viewed to result from a chronic inflammatory process. De Pergola (Italy) et al. [9] set out to provide further evidence for this hypothesis by identifying predictors of common carotid artery intima-media thickness. For this purpose, they additionally determined BMI, waist circumference, blood pressure, fasting insulin, glucose, lipids, C3 and C-reactive-protein serum concentrations, and insulin resistance degree in 140 euthyroid, mainly overweight young adult subjects. Whereas carotid intima-media thickness was positively correlated with CRP and C3 serum levels (among most of the other aforementioned variables), multiple linear regression analysis revealed that only male gender and waist circumference independently predicted intima-media thickness. The immune parameters did not have an independent influence. The cross-sectional study design needs to be kept in mind upon interpretation of these results.

Tambalis (Greece) et al. [10] used time-series analyses to probe for a relationship between declining physical fitness and increasing obesity prevalence rates in Greek schoolchildren. Population data were derived from 10 consecutive, national school-based health surveys between 1997 and 2007 resulting in a total of 651,582, 8- to 9-year-old children. BMI was determined, and vertical jump, small ball throw, 30-meter sprint and a multi-stage 20-meter shuttle run were used to assess fitness. The level of aerobic fitness decreased by 4.9% for boys and 4.5% for girls between 1997 and 2007. A stratified analysis of the secular trend of obesity during this time span by quartile of aerobic fitness and gender revealed significant differences in the rates of obesity among different fitness quartiles in both genders. With the increase in obesity rates, aerobic fitness levels decreased. A rapid increase of poor quartile performances among 8- to 9-year-old children of both genders was observed. Overweight/obese children presented a higher risk of low performance compared with their normal-weight counterparts in almost all fitness tests. However, time-series analyses revealed that the increasing trends in the prevalence of overweight and obesity in Greek children were independent of the reduction in fitness levels in this population.

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