METHODS: Body mass index and WC were assessed in 538 apparently healthy males and females between 30 and 65 years of age who were part of the Multicultural Community Health Assessment Trial (M-CHAT). Participants were assessed for baseline BMI and WC and followed for five years and assessed for SRPH (using the EuroQOL-5D questionnaire). The Euro-QOL questionnaire asked participants to rate their current state of health out of a maximal score of 100, with 100 being the best health they have had in their life. Bivariate correlation analyses were used to explore the relationships between and baseline BMI and baseline WC with five year SRPH. The analysis of variance (ANOVA) was used to compare SRPH scores at year five among normal, overweight and obese individuals based on baseline BMI. A T-test was used to compare SRPH scores at year five between high and low abdominal obesity based on baseline BMI. A WC at or above 102 cm for men and 88 cm for women was used for the threshold. Linear regression was used to explore the separate association between baseline BMI or WC and five-year SRPH adjusted for age, sex, smoking status and ethnicity.

RESULTS: Baseline BMI ($r=-0.104, p<0.05$) and WC ($r=-0.104, p<0.05$) were negatively correlated with QOL score at five year follow-up. Baseline BMI had no significant effects on five-year QOL scores ($p=0.09$). Participants with a high WC at baseline had lower five-year QOL scores compared to participants with low WC at baseline ($X=76, SE=1$ vs. $X=79, SE=1$, $p<0.05$). Baseline WC was a negative predictor of SRPH scores at year five ($\beta=-0.139, p<0.05$) adjusted for age, sex, ethnicity, and smoking status.

CONCLUSION: While BMI, as an overall indicator of obesity, was not associated with participant perceived health, WC was, such that increased WC was a predictor of decreased perception of health. This further indicates the detrimental impact that central obesity has on individuals.

019
THE ROBUST ANGIogenic RESPONSE TO HINDLimb ISCHEMIa IN MICE YIELDS A MICROvasculature THAT IS STRUCTURALLY AND FUNCTIONALLY ABNORMAL
J Arpino, Z Nong, H Yin, F Li, S Milkovich, CJ Ellis, JG Pickering
London, Ontario

BACKGROUND: The development of new blood vessels in ischemic tissues is critical to tissue regeneration and occurs vigorously in the mouse following hindlimb ischemia. However, the extent to which a capillary network is functionally restored is unknown. This is partly because strategies for evaluating the microvascular flow in regenerating tissue are limited.

METHODS/RESULTS: To determine if the angiogenic response to ischemia leads to a functioning microvascular network, we subjected male C57BL/6 mice to proximal femoral artery excision and undertook intravital video microscopy of the surface microvasculature of the extensor digitorum longus (EDL) muscle. Microvascular flow was delineated over 28 days using UV-fluorescence (330-385 nm) imaging and following intravenous injection of FITC-Dextran (460-490 nm). Microvascular flow was captured live at a video frame rate of 21 frames/second. This revealed a complete absence of microvascular flow along the entire surface of the EDL muscle for 4 days following femoral artery excision. On day 5, perfusion in the distal muscle started, but in dilated channels that were up to 6-fold wider than normal capillaries with very slow flow rates, ranging from 0-47% of red blood cell flow in baseline control capillaries (136±133 μm/sec). By day 7, flowing microvessels existed throughout the EDL surface and the markedly dilated vessels were no longer evident. By day 14, microvascular length density returned to baseline (0.0135±0.0003 μm microvessel/μm²), however branch prevalence was elevated (3.2±0.6 vs 2.1±0.4 branch points/mm of microvessel, $P<0.05$). As well, large-caliber arteriolar vessels were found running parallel to the EDL surface, uncharacteristic of control networks, and some of which were seen to flow directly into venous structures, bypassing a capillary network. Finally, mean microvascular flow increased to only 77.7% of baseline capillary flow (458±228 μm/sec) and displayed less regional variability than in non-ischemic muscle.

CONCLUSION: Following mouse femoral artery excision, a flowing microvascular network forms after an extended period of no-flow, but with vessels that initially bear no resemblance to capillaries. These channels rapidly remodel into a highly branched microvascular network with aberrant flow patterns. Thus, despite the return of flow to ischemic muscle, the microvasculature is abnormal. This vital limitation to post-natal angiogenesis needs to be considered when designing strategies for tissue regeneration.

020
RELATION BETWEEN DIETARY INTAKES AND CYTOKINE CONCENTRATIONS AMONG NORMAL WEIGHT, OVERWEIGHT AND OBESE WOMEN WITH PRIOR GESTATIONAL DIABETES MELLITUS
S Chouinard-Castonguay, J Vigneault, G Faucher, S Weisnagel, A Tchernof, J Robitaille
Québec, Québec

Adipose tissue-derived cytokines might be involved in the development of obesity-related complications such as diabetes. Dietary factors may modulate adipose tissue function and affect circulating levels of cytokines. However, few data are available, especially in women with prior gestational diabetes mellitus (GDM). The aim of this study was to investigate the relationship between diet and the circulating cytokine profile.
in women with prior GDM and to examine the differences according to obesity status. The study group included 202 women with a history of GDM between 2003 and 2010 based on diagnosis data from databanks provided by the Régie de l’assurance maladie du Québec (RAMQ) and for whom data on diet and cytokines were available. Nutritional information was obtained from a validated interviewer-administered food frequency questionnaire (FFQ). The cytokine profile (leptin, resistin, ghrelin, adiponectin, visfatin, IL-6, TNF-α and PAI-1) was measured in fasting plasma by the xMAP® technology using the Bio-Plex 200 system. Analyses were adjusted for age and BMI. Mean age and body mass index (BMI) was 36.4±4.9 years and 27.7±6.6 kg/m² respectively. Time between last GDM-complicated pregnancy delivery date and metabolic testing was 4.1±1.7 years. Among normal weight women (BMI <25 kg/m²), dietary intakes of total omega-3 fatty acids, α-linoleic acid (ALA), eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) (r=-0.23 to -0.32, p<0.05) were negatively correlated with leptin concentrations. No association was found in normal weight women between dietary intakes and resistin, ghrelin, adiponectin, visfatin, IL-6, TNF-α and PAI-1 concentrations (p>0.05). For overweight women (BMI ≥25 and <30 kg/m²), no association was observed between dietary intakes and the entire cytokine profile (p>0.05). Among obese women (BMI ≥30 kg/m²), dietary intakes of total fat, monounsaturated fatty acids (MUFA), polyunsaturated fatty acids (PUFA), ALA, omega-3 fatty acids and omega-6 fatty acids were negatively correlated with ghrelin, TNF-α and IL-6 concentrations (r=-0.30 to -0.41, p<0.05). Dietary intakes of DHA was negatively correlated with IL-6 concentrations (r=-0.29, p=0.03). Dietary intakes of PUFA and omega-6 fatty acids were also associated with visfatin concentrations (r=-0.31 and -0.32, p<0.05). No association was found between dietary intakes and resistin, adiponectin and PAI-1 concentrations in obese women. These results suggest that, among women with prior GDM, dietary fat intakes are associated with the cytokine profile. This association varies according to the obesity status.

021 CARDIOVASCULAR AND METABOLIC EFFECTS OF WEIGHT CYCLING IN A DOG MODEL OF OBESITY

JL Adolphe, TI Silver, MD Drew, LP Weber
Saskatoon, Saskatchewan

BACKGROUND: Obesity is an established risk factor for cardiovascular disease. It is still unclear whether the detrimental cardiovascular and metabolic changes that occur with obesity return to pre-weight gain levels. The purpose of this cross-over study was to examine effects of weight gain and weight loss on cardiovascular and metabolic changes in an obese dog model.

METHODS: At baseline, dogs (n=8) were fed a commercial diet in amounts to maintain ideal body weight. The dogs then were given unlimited access to the same diet to allow weight gain, followed by weight loss via portion restriction. Measurements were taken at baseline, after weight gain, and after weight loss. Cardiovascular health was assessed using echocardiography and blood pressure measurements. Metabolic changes were examined by performing oral glucose tolerance tests as well as measurement of plasma adiponectin and leptin. In addition, CT scans were performed after weight gain and loss to assess body fat.

RESULTS: Dogs were obese (23 ± 3% above ideal body weight) after 12 weeks of ad libitum feeding. After weight loss, dogs were 5 ± 2% above baseline weight. Compared to the lean state, obesity resulted in negative cardiovascular changes, including increased systolic left ventricular free wall thickness (LVFWs; 0.99 ± 0.04, 1.07 ± 0.04 cm) and elevated heart rate (71 ± 3, 93 ± 5 bpm) (p<0.05 in paired t-tests). Metabolic changes with obesity included increased area under the curve (AUC) for glucose (158 ± 31, 249 ± 30 mmol/L*min), fasting glucose (4.8 ± 0.2, 5.6 ± 0.2 mmol/L), peak glucose (8.3 ± 0.7, 10.3 ± 0.5 mmol/L), and plasma leptin (1.1 ± 0.8, 3.3 ± 0.9 ng/ml), as well as decreased plasma adiponectin (22.4 ± 5.0, 14.5 ± 2.9 μg/ml). When the dogs were obese, LVFWs was positively correlated with total fat (r=0.7, p=0.046) and visceral fat (r=0.8, p=0.025). After weight loss, the negative changes observed with obesity were no longer different than baseline except for adiponectin which remained significantly lower and all end-points failed to correlate with visceral fat. Insulin AUC and LVFWs were actually lower after weight loss than at baseline.

CONCLUSION: This study suggests that visceral fat is linked to detrimental changes in cardiac function and glucose intolerance during obesity, but not weight loss. These results are particularly remarkable considering the short time for weight gain and weight loss, with more chronic weight changes likely to exert greater adverse effects.

022 LOW GLYCEMIC INDEX PEA DIET IMPROVES INSULIN SENSITIVITY AND ALTERS BODY FAT DISTRIBUTION IN A DOG MODEL OF OBESITY

JL Adolphe, TI Silver, MD Drew, LP Weber
Saskatoon, Saskatchewan

BACKGROUND: Low glycemic index foods may be cardioprotective and encourage weight loss; however, their effect on insulin resistance and body fat distribution requires further clarification. The objective of this study was to examine the effect of a low glycemic index pea-based diet versus a high glycemic rice-based diet on cardiovascular health, metabolic parameters and body fat distribution in a dog model of obesity.

METHODS: A cross-over study was performed with obese laboratory beagles who were randomly assigned to receive unlimited access to either a pea- (n=8) or rice-based (n=9) diet for