# *ICCN* Poster Presentations

## Nutrition and cardiovascular disease

### Triacylglycerols-induced oxidative stress and necrotic cell death in J774.2 macrophages

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It is well known that excess lipid accumulation in non-adipose tissues can lead to lipotoxicity manifested as cellular dysfunction and cell death. To date, the role of free fatty acids (FFAs) in induction of cellular apoptosis is understood to a large extent. This role involves elevation of nitric oxide (NO) and activation of the ceramide pathway. However, lipids are stored in non-adipose tissues predominantly in the form of triacylglycerides (TG), whose direct contribution to lipotoxicity is not yet clear and appears to be highly complex. The aim of this study was to determine death mechanism of macrophages as a result of exposure to TG. For this purpose commercial lipid emulsion (LE) was added to J774.2 cell culture in concentration of 1%. It was found that exposure of J774.2 macrophages to TG has led to decreased apoptosis (decreased basal caspase activity) and to increased survival within the first 24 hours after treatment with TG. In contrast, after 48 hours the TG effect culminated in massive cell death of 50% with no caspase activation as measured by DEVDase activity. Moreover, TG blocked the activation of caspase following pretreatment with 0.1 μg/ml cycloheximide for 24h, an agent that induces apoptosis, thus changing the type of cell death to necrosis. Furthermore, TG induced the generation of reactive oxygen species. Treatment with water soluble antioxidants N-acetyl-cysteine (0.5 mM) and ascorbic acid (0.5 mM) protected against the lipotoxic effect of the TG. Surprisingly, lipid soluble antioxidants had no protective effect on the cell viability. Therefore, TG may directly regulate lipotoxicity by inducing oxidative stress, which, in turn, may result in oxidation of the caspase system and the activation of necrotic cell death. This mechanism is different from that activated by FFAs. The findings contribute to an understanding of obesity physiological mechanisms that are related to lipid-induced toxicity.

### Cardiovascular disease risk factors among a sample of Malay older adults aged 50 to 65 years old

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A cross-sectional study was carried out to assess the cardiovascular disease (CVD) risk factors among a sample of Malay older adults aged 50 to 65 years. A sample of 152 respondents (88 males and 64 females), who met the selection criteria, were randomly selected. The data were collected through interviews, anthropometric and blood pressure measurements, and collection of blood samples. About half of the subjects (57.9%) were in the age group of 50 to 55 years with a mean age of 55.1 years. About 40% of the subjects had a family history of CVD and about half of the subjects (51.3%) were considered as inactive. Cigarette smoking was observed among males only (18.4%). About 37% of the subjects had personality type categorized as at increased risk. The distribution of overweight (Body Mass Index or BMI 25.0-29.9 kg/m$^2$) and obesity (BMI $\geq$ 30kg /m$^2$) were 46.1% and 27.6%, respectively. The distribution of hypercholesterolemia (total cholesterol or TC $\geq$6.2 mmol/L) among the subjects was 25% with almost equal proportions in males (26.1%) and females (23.4%). Raised LDL cholesterol (LDL-C) was found in 42.8% of the subjects, while low levels of HDL cholesterol (HDL-C) was evident in 28.9% of the subjects. The distribution of hypertriglyceridemia (triglyceride or TG $\geq$ 2.3 mmol/L) among the subjects was 13.8%. The distribution of high blood pressure and high blood glucose were 65.8% and 21%, respectively. Based on the nine CVD risk factors, 36.8% of the subjects had more than five risk factors, especially males (42%). According to the classification of CVD risk, 26.3% of the subjects were at high to very high risk (36.4% for males and 12.5% for females). The mean BMI was significantly higher for females than males (t= -3.359, p<0.05). There were no significant differences in mean TC, systolic blood pressure (SBP) and diastolic blood pressure (DBP) between both sexes. BMI correlated significantly with HDL-C (r= -0.243, p<0.05), SBP correlated significantly with TG (r= 0.219, p<0.05), and DBP correlated significantly with TG (r= 0.229, p<0.05) in males. SBP correlated significantly with TC (r= 0.290, p<0.05), DBP correlated significantly with LDL-C (r= 0.313, p<0.05), and DBP correlated significantly with TG (r= 0.264, p<0.0.5) in females. In conclusion, the study indicated that there was a high prevalence of overweight, elevated LDL-C, and high blood pressure among the subjects. Risk factors such as overweight, dyslipidemia, and high blood pressure are modifiable. Therefore, appropriate community-based intervention programmes should be reinforced to reduce the problem of high distribution of multiple CVD risk factors among older adults.