**Dietary prevention of atherogenesis is consistently associated with increased levels of plasma erythropoietin in low density lipoprotein receptor knock-out mice**

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Atherosclerotic cardiovascular disease (CVD) is a major source of morbidity and mortality globally. Accumulating evidence has suggested that diets and lifestyle significantly contribute to the risk factors for atherosclerotic vascular disease. We previously reported the significant anti-atherogenic effects in low density lipoprotein receptor knock-out (LDL-r-KO) mice; control (n=10) and treated groups (n=10) fed atherogenic diets (0.06% (w/w) dietary cholesterol), while treated mice received diets supplemented with wild rice (60% w/w), Kgengwe (Citrullus lanatus) seeds (10% w/w), or phytosterols (2% w/w) for 20 weeks. This study was approved by the Animal Care Committee at the University of Manitoba. To examine the potential mechanism of action of these diets, plasma samples of treated and control mice were collected to measure plasma lipid profile and a panel of 35 plasma inflammatory cytokines, using commercially available enzymatic kits and Meso Scale Discovery U-PLEX Mouse multiplex assay, respectively. At the end of the study, mice were sacrificed; hearts were collected and processed for morphological and morphometrical examination of aortic roots to measure atherosclerotic lesions. Atherosclerotic lesion size was significantly lower in the treated groups as compared to that in the control group (p<0.05). While the effects of these dietary treatments did not consistently reduce plasma lipid levels, a significant (p<0.05) upsurge in the plasma levels of erythropoietin (EPO) was observed in all the treated groups including wild rice (15.64 ± 3.32 pg/mL), Kgengwe seed powder (15.84 ± 4.47 pg/mL), and phytosterols mixture (10.06 ± 2.14 pg/mL) as compared to control group (5.84 ± 2.27 pg/mL). Our results suggest that anti-atherogenic effects of these functional diets are mediated through increased levels of erythropoietin. Further studies are required to understand the mechanism of EPO in relation to atherogenesis beyond its haematopoietical effects. (Supported by Natural Sciences and Engineering Research Council of Canada (NSERC) and Southern African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL) Grants).