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Pathogenesis of Atherosclerosis: Focusing on the role of exercise and flavonoids

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Atherosclerotic coronary artery disease accounts for the majority of death in the world. A number of determinants most of them associated with lifestyle starting from early childhood onwards are responsible for Cardiovascular Diseases (CVD). Some risk factors facilitate the development of atherosclerosis, while others participate in the plaques formation, resulting in the manifestation of the disease. Objectives: In the current study we investigated the role of exercise and antioxidants intakes; specifically quercetin in mouse model. We looked into the sex responses to the quercetin intake and physical activity. We also looked into the effect of quercetin treatment on HepG2 cell line. Study design: Animals (males and females), normal and LDL-/- C57BL6 were used in these studies. Animals were fed atherogenic diet and quercetin and subjected to exercise or sedentary life. HpG2 cells were treated at different dosages for several hours. Animal tissues (liver and aorta) and cell harvest analyzed for the level of inflammation, oxidative stress and lipoprotein metabolism gene expression. Adipose tissues were also harvested from these animals; leptin and adiponectin and other related genes were assessed. We also investigated selected miRs namely miR 21, 125b and 451 in atherosclerosis development and progression. These miRs expression were measured in liver and aorta. Results and conclusion: Interestingly; although we observed significant reduction in atherosclerotic plaque size in exercising and quercetin taking animals; these treatments have shown differential effects on lipoprotein plasma levels and associated gene expression, similar findings were also observed in HepG2 cell culture and in inflammation associated gene expression.