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Poster

Obesity induced renal inflammation in high-fat-diet obese rats: possible effects of anthocyanin rich fruits

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Excess weight gain related to essential hypertension and diabetes is recognized as a major medical challenge and it is associated with the development of end-stage renal disease such as chronic kidney disease (CKD). Accumulating evidence suggests that obesity contributes to CKD through multiple mechanisms, including hemodynamic alterations, chronic inflammation, insulin resistance, and lipid accumulation [1]. Increased expression of renal injury markers and pro-inflammatory factors may be associated with downregulation of dopamine D2 receptors. Furthermore, recent findings suggest that transient receptor potential (TRP) ion channel dysfunction has a significant impact on the pathophysiology of various diseases. In this contest, the intake of dietary supplements containing natural compounds can reduce oxidative stress and inflammatory processes in animal models of obesity [2].

The present study evaluated the risk of diet-induced obesity (DIO) in rats, potentially associated with renal damage, oxidative stress, and inflammatory processes related to the regulation of the dopaminergic system and the interaction with TRP channels. The effect of tart cherry supplementation on renal morphological changes in DIO rats was investigated. Different groups of DIO rats were fed with either tart cherry seed powder (DS) or seed powder plus tart cherry juice (DJS). DIO rats were compared with control rats that were fed a standard diet (CHOW).

In our model, obesity was associated with renal cortical damage, including glomerular sclerosis and tubular atrophy. Analysis of inflammatory cytokines in DIO rats showed increased expression in glomeruli and the base of proximal and convoluted tubular cells. The expression of D5 receptors and D2-like receptors was altered in DIO rats compared with CHOW. TRPC1 and TRPM2 were upregulated, whereas TRPC6 slightly decreased, in the kidneys of DIO rats. Immunohistochemical analy-

sis showed that TRPC6 was expressed at the glomerular and tubular segmental levels, whereas TRPC1 and TRPM2 were mainly expressed at the tubular level. While inflammation was improved in the obese group, tart cherry supplementation reduced renal IL-1 β and IL-6 levels and TRP over-expression.

In conclusion, the modulation of TRP channels and dopamine receptors in rats supplemented with tart cherries may play a significant role in explaining the protective effects linked to their anti-inflammatory and antioxidant properties. Further research is needed to clarify the potential benefits of these compounds as bioactive products in preventing obesity-related kidney disease.

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Keywords: High-Fat Diet, Obesity related kidney damage, Anthocyanin rich fruits.