

Inflammation in white adipose tissue of obese rats: effects of seeds and juice of *Prunus cerasus* L

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Tart cherries (*Prunus Cerasus* L.) are a rich source of anthocyanins, phytochemical flavonoids found in red-, blue- and purple-pigmented fruits and vegetables. The components of these plants can modify lipid metabolism in vitro and reduce hyperlipidemia in vivo. Dyslipidemia, hypertension, impaired glucose tolerance, insulin resistance often accompany obesity, in which adipose tissue accumulation and metabolic changes increase the incidence of heart failure and stroke. Visceral adipose tissue (VAT) has emerged as a major player in driving obesity-related inflammatory response. In obesity, chronic infiltration of macrophages in adipose tissue mediates local and systemic inflammation. Transient receptor potential (TRP) proteins are members of a superfamily of cation channels playing a role in the pathophysiology of different systems. They are implicated in inflammatory responses, via their functions in pro-inflammatory immune cells either resident or infiltrating. This study has investigated the potential positive effects of tart cherries on rats with Diet-Induced Obesity (DIO) on the inflammatory status of the VAT. Rats had for 17 weeks a hypercaloric diet with the supplementation of tart cherries seeds powder (DS) and seeds powder plus tart cherries juice containing 1mg of anthocyanins (DJS). DIO rats were compared to the control rats with standard diet (CHOW). In VAT, expression of TNF, CcL2, CD-68, and TRP-channels were measured by qRT-PCR, western blot, and immunohistochemistry techniques. All DIO rats groups increased significantly their body weight compared to CHOW rats. No difference in VAT weight was found in DS and DJS rats compared to age-matched DIO rats. In perigonadal and retroperitoneal AT, an increase of inflammatory markers was observed with a different modulation in DIO rats tart cherries supplemented. Furthermore, TRP channels are modulated with increasing expression of TRPV channels and decreasing of TRPC channels. Tart cherries supplementation regulated in different ways the TRP channels expression. These results suggest that tart cherries enriched-diet, although did not modify the accumulation of visceral fat, it decreased inflammation markers in the VAT. This supplementation could be therefore useful, in combination with healthy lifestyles, to modify adipose tissue cells metabolism and to limit secondary organ damage in target tissues of obesity.

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Key words

Obesity, Visceral adipose tissue, inflammation, tart cherries.