P2.9 PROTECTIVE ROLE OF TART CHERRY AGAINST WHITENING OF BROWN ADIPOSE TISSUE OF OBESE RATS

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Obesity has a great impact on adipose tissue biology, based on its function as the master regulator in energy balance. The excess of energy affects the adipose tissue with an overstoring of lipids droplets. Brown adipose tissue (BAT) undergoes remodeling, and its activity declines in obese subjects, mainly as a result of the conversion of brown adipocytes to white-like unilocular cells (whitening process). In addition, obesity is associated with endoplasmic reticulum stress in adipose tissue, and free fatty acids induce reactive oxygen species formation. Studies have identified inflammation and immune cell infiltration as contributors to BAT dysfunction. Reduction of oxidative stress and inflammatory processes have been reviewed in animal models of obesity treated with bioactive natural compounds. Thus, we investigated in interscapular BAT (iBAT) the effects of *Prunus cerasus* L. in obese rats fed with a high-fat diet (HFD) called DIO, an HFD supplemented with seed powder (DS), and with seed powder plus juice (DJS) of tart cherries. Rodents were monitored for 17 weeks of HFD and compared to CHOW rats fed with a standard diet. Morphological staining revealed in DIO rats an enlargement of white adipose tissue in iBAT. Tart cherry supplementation reduced obesity-induced whitening of iBAT both in DS and in DJS, compared to DIO rats. A modulation of uncoupling protein 1 (UCP1) expression, specifically in brown adipocytes, was detected in obese phenotype and after tart cherries intake. Predictably, based on the brown-to-white conversion in obesity, the gene expression results showed a downregulation of UCP1 in DIO compared to CHOW rats. Moreover, an upregulation of the thermogenic genes was found in the supplemented rats compared to DIO. Metabolic adaptations, endoplasmic reticulum stress, protein carbonylation, and inflammatory process in the BAT were reported in obese rats, modulated by tart cherries supplementation. In addition to our previous results, these data suggest the protective effect of anthocyanins-enriched fruit consumption in obesity.

P2.10 MORPHOLOGICAL STUDY OF COLONIC MUCOSA IN MICE WITH DEXTRAN SULFATE SODIUM-INDUCED COLITIS: THE IMPACT OF PROBIOTIC SUPPLEMENTATION

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Inflammatory bowel diseases (IBD) are chronic gastrointestinal disorders that can impair the patient's quality of life.[1] Dextran sulfate sodium (DSS)-induced colitis is one of the most common mice models of chemically induced IBD.[2] The treatments for IBD showed insufficient therapeutic efficacy. Many studies identified dietary supplementation with probiotics as a promising intervention by alleviating clinical symptoms. The potential properties of *Weissella paramesenteroides* A1 (*Wp*) and *Pediococcus acidilactici* 46A (*Pa*) were evaluated on a murine model of DSS-induced colitis. 8-week-old mice were used. Colitis was induced by administering 3% (w/v) DSS in drinking water for 7 days. Probiotics were supplemented orally (1×10^8 CFU daily) for 10 days before DSS administration. Weight loss, stool consistency and intestinal bleeding were monitored to evaluate the clinical progression of colitis. Microscopically, histological damage, inflammatory cells infiltration and pro-inflammatory cytokines expression were assessed on proximal and distal colon sections. *Pa* supplementation was able to reduce the macroscopic severity score while not affecting weight loss. The histological damage was recorded for impairment of crypts architecture, goblet cells depletion and inflammatory infiltrate. The colitis severity was reduced in the *Pa* pretreated mice compared to the DSS group. The presence of $CD3^+$ cells was lower in the *Pa* pretreated animals compared to DSS. The same pattern was observed in the sections incubated with TNF-α antibodies. Particularly in the *Pa* treated mice was appreciated a reduction of inflammatory cells in the area in which the colonic wall cytoarchitecture was maintained. These results showed the potential use of specific strains of bacteria to treat intestinal disorders. *Pa* is active against intestinal inflammation in DSS-induced colitis although further studies are necessary to better characterize its possible implication as a therapeutic agent against IBD.

References

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