

Improvement of Vascular Oxidative Stress in Diabetic Rats by Supplementation with a Wine Pomace Product

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Abstract : Grape, wine and wine pomace could improve the antioxidant status in the vasculature in terms of plasma antioxidant capacity and oxidation biomarkers, partly due to their high content in polyphenols. The current study aimed to evaluate the protection of a powdered product obtained from wine pomace (WPP) against oxidative damage associated to diabetes. Streptozotocin-induced diabetic (STZ) male Wistar rats and non-diabetic control (C) rats initially weighting 300 ± 10 mg were supplemented with 100 mg of WPP or vehicle for 4 weeks. Blood glucose levels and body weight (BW) were measured weekly. Total antioxidant capacity (TAC) assessed using the ABTS method, and F2 α -Isoprostanes (F2-IsoPs) quantified by GC-MS were measured in plasma collected at the end of this experiment. Blood glucose levels tended to increase in the STZ group along the study. Supplementation maintained relatively stable during the whole experiment the blood glucose values in STZ+WPP rats. A weight loss of BW in STZ rats respect to C rats was observed after 4 weeks, whereas the decrease in BW of STZ+WPP group showed a tendency to improve at the end of the study. TAC values significantly decreased around 11% only in plasma of STZ rats. The rest of groups showed plasma TAC values about 8 mM Trolox. Increased levels of F2-IsoPs (around 25%) were also observed in plasma of STZ rats compared to the supplemented rats, revealing a protective effect of WPP against lipid peroxidation. In conclusion, 4-week supplementation with a product derived from winery by-products improved weight loss, plasma TAC, and lipid oxidation biomarkers in Type I diabetic rats.

Keywords : blood glucose, grape polyphenols, F2 α -isoprostanes, type I diabetes, oxidative stress

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