Antioxidant effect of wine Tannat under oxidative stress in vitro model of hyperglycemia

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Introduction: Erythrocytes subjected to high concentrations of glucose or fructose increasing oxidative stress. Objective: to observe the effect of antioxidant Tannat wine on oxidative stress induced by glucose/fructose in erythrocytes in vitro. Methodology: tubes containing erythrocytes were incubated with glucose/fructose at different concentrations at 37°C for 24h in the presence or absence of wine. Thiobarbituric acid reactive species were determined in according to Ohkawa et al. (1979); glucose consumption employing a commercial kit; the total phenolic content in wine by the Folin-Ciocalteau assay method; gallic acid, caffeic acid, epicatechin and resveratrol using HPLC and the antioxidant capacity of wine employing the DPPH Scavenging Activity. Statistical analysis used ANOVA one way and Duncan test as post hoc (p<0,05). Results: erythrocytes incubated with glucose/fructose resulted in a significant increase in lipid peroxidation comparing with control group. In presence of 0,075, 0,15 and 0,225 mL of wine/mL of incubated blood was observed significant decrease in lipid peroxidation induced by glucose. Concentrations of total polyphenols, gallic acid, caffeic acid, epicatechin and resveratrol contained in wine were 4,31g/L GAE, 126,31mg/L, 78,10mg/L, 265,51mg/L, 90,87mg/L, respectively. Their antioxidant potential was 71%. Consumption of glucose by erythrocytes at concentrations of 5 and 10 mM was significant, which did not occur for concentrations of 30 and 100 mM. At concentrations of 30 and 100 mM glucose incubated with 0,075 mL of wine occurred an increase in glucose uptake by erythrocytes. Conclusion: Red wine decreased lipid peroxidation caused by high concentrations of glucose/fructose and reversed the inhibition of glucose uptake.

Word Keys: erythrocytes, glucose, lipid peroxidation, polyphenols, wine.