

THE GRAPE POLYPHENOL CONCENTRATE EFFECT ON LIPID METABOLISM IN RAT AORTA UNDER EXPERIMENTAL INSULIN RESISTANCE

Adeyemo Blessing Tosin, Kochubey Yu. I.

Scientific supervisor: ass. prof. Krasilnikova O. A.

National University of Pharmacy, Kharkiv, Ukraine

meceqween@gmail.com

Introduction. Many studies have documented an association between insulin resistance and accelerated cardiovascular disease (CVD) in patients with type 2 diabetes. Insulin resistance and lipotoxicity represent the missing links that help to explain the accelerated rate of CVD. Accumulation of toxic lipid metabolites in muscle, liver, adipocytes and beta cells contributes to insulin resistance, beta cell dysfunction and accelerated atherosclerosis. Treatment with diet, exercise and drugs mobilizes fat out of tissues, leading to enhanced insulin sensitivity, improved beta cell function and decreased atherogenesis.

Grape are the source of polyphenols, compounds characterized by their antioxidant properties, which may protect against atherosclerosis. Grape polyphenols affect several metabolic processes that lead to reductions in atherosclerosis including decreases in LDL oxidation and platelet aggregation, increases in flow-mediated vasodilation, reduction in inflammatory cytokines.

Aim. The aim of this work was to study the effect of grape polyphenols complex on lipid metabolism in the rat aorta wall under experimental insulin resistance.

Materials and Methods. The experimental study was conducted on 3 months male rats and weight that were procured from vivarium NUPh. Animals were kept on a high-fat and high-fructose diet during 5 weeks to induce experimental insulin resistance. Grape polyphenols were administered two weeks in dose 9 mg polyphenols/kg/day. Thoracic aorta was isolated and homogenized in potassium phosphate buffer, pH 7.6. Lipids were extracted by chloroform/methanol solution and separated by TLC. The lipid content was determined according to the March method.

Results and discussion. We observed an increase of triacylglycerol (TAG), free fatty acids (FFA) and cholesterol levels in the rat aorta wall under experimental insulin resistance. The observed changes indicate that the insulin resistance state is accompanied by the development of pro-atherogenic changes in the aortic wall. The grapes polyphenol administration led to a decrease in the TAG, FFA and cholesterol content by 1.97, 2.34 and 2.23 times, respectively.

Conclusions. The data obtained indicate that the investigated grape polyphenol complex prevents the development of proatherogenic changes in the aortic wall of rats under experimental insulin resistance.