RESVERATROL/HYDROXYPROPYL-\(\beta\)-CYCLODEXTRIN INCLUSION COMPLEX HAS NOT REVERSED THE INHIBITION OF HEPATIC PYRUVATE KINASE ACTIVITY IN DIABETIC RATS

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Introduction and objective Nanoparticles (NPs) have been used as drug carriers; among these we highlighted the hydroxypropyl-\(\beta\)-cyclodextrin (HP\(\beta\)CD), which are able to form inclusion complexes with hydrophobic substances such as resveratrol (RSV) improving its water solubility. RSV has been extensively studied for prevention and treatment of metabolic disorders including diabetes. The aim of this study was to evaluate whether oral administration of inclusion complex of resveratrol could reverse the inhibition caused by diabetes on hepatic pyruvate kinase.

Methods The experiment was approved by local Ethics Committee under protocol number 013/2012. Thirty-five Wistar rats were induced to diabetes type 1 by streptozocin, and thirty-five non-diabetic rats were treated for two months. These rats were divided into different groups: Control, Ethanol, RSV, Inclusion complex and HP\(\beta\)CD group. After the death of animals, the blood was separated for biochemical analysis. The liver was homogenized in buffer solution for assay of pyruvate kinase (PK) enzyme. All chemicals were purchased from Sigma Chemical Co.

Results and conclusion Liver PK activity was reduced in all diabetic groups when compared with non-diabetic control group (p<0.001). Both rats and humans with diabetes type 1 have liver PK inhibited due to the absence of insulin, an activator of this enzyme in the liver. In this research, free or complexed RSV showed no hypoglycemic activity, which was evaluated by high glycemic rate and through the liver PK activity. The inhibition favors the gluconeogenic pathway that contributes further to hyperglycemia characteristic of diabetes.

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