CARDIOPROTECTIVE EFFECTS OF GLP-1 RECEPTOR AGONISTS ON ISCHEMIA/REPERFUSION INJURY IN ISOLATED HEARTS OF RATS WITH METABOLIC SYNDROME

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Metabolic syndrome (MetS) represents a cluster of medical conditions, including central obesity, hypertension, dyslipidemia, and insulin resistance, associated with increased risk of cardiovascular morbidity and mortality. Liraglutide, exenatide and dulaglutide belong to a group of drugs called glucagon-like peptide-1 (GLP-1) receptor agonists. Although they are used in clinical practice, their effects in various types of disorders and organs are still the subject of research. The aim of this study was to assess and compare the effects of three GLP-1 receptor agonists, liraglutide, exenatide and dulaglutide on cardiodynamic parameters during ischemia and reperfusion in isolated hearts of rats with metabolic syndrome.
The experiments was conducted on 32 male Wistar Albino rats (8 rats per each group): healthy untreated rats, untreated rats with MetS, rats with MetS treated with liraglutide, exenatide and dulaglutide, respectively. MetS was induced by the use of a high-fat diet for 4 weeks and low doses of streptozotocin (30 mg/kg), and the use of the drugs lasted 6 weeks from the confirmation of hyperglycemia. At the end of the experiment the animals were sacrificed, the hearts were perfused according to the Langendorff technique.
All applied drugs exerted cardioprotective effects. The most pronounced cardioprotective effect of liraglutide was observed in the parameters of myocardial contractility (dp/dt max and dp/dt min) and systolic left ventricular pressure (SLVP). Both liraglutide and dulaglutide showed similar protective effect in maintaining heart rate and coronary flow during the reperfusion period.
GLP-1 receptor agonists, as a novel therapeutic approach, have the potential as cardioprotective agents in ischemia/reperfusion injury.

Keywords: Liraglutide; Exenatide; Dulaglutide; Heart Function; GLP-1 Receptor Agonists.