

## THE ROLE OF TREATMENT WITH GLP-1 RECEPTOR AGONIST LIRAGLUTIDE ON ISOPRENALINE-INDUCED MYOCARDIAL INJURY IN RATS

*Zorislava Bajić<sup>1</sup>, Tanja Šobot<sup>1</sup>, Snežana Uletilović<sup>2</sup>, Nebojša Mandić-Kovačević<sup>3</sup>, Tanja Cvjetković<sup>2</sup>, Sanja Avram<sup>4</sup>, Uglješa Maličević<sup>5</sup>, Đorđe Đukanović<sup>5</sup>, Mladen Duran<sup>5</sup>, Nikolina Vesić<sup>5</sup>, Dragan M Đurić<sup>6</sup>, Miloš P Stojiljković<sup>7</sup>, Ranko Škrbic<sup>7</sup>*

<sup>1</sup>Department of Physiology, Faculty of Medicine University of Banja Luka, Banja Luka, the Republic of Srpska, Bosnia and Herzegovina

<sup>2</sup>Department of Medical Biochemistry and Chemistry, Faculty of Medicine, University of Banja Luka, Banja Luka, the Republic of Srpska, Bosnia and Herzegovina

<sup>3</sup>Department of Physical Chemistry, Faculty of Medicine, University of Banja Luka, Banja Luka, the Republic of Srpska, Bosnia and Herzegovina

<sup>4</sup>Institute of Laboratory Diagnostic, University Clinical Centre of The Republic of Srpska, Banja Luka, the Republic of Srpska, Bosnia and Herzegovina

<sup>5</sup>Centre for Biomedical Research, Faculty of Medicine, University of Banja Luka, Banja Luka, the Republic of Srpska, Bosnia and Herzegovina

<sup>6</sup>Faculty of Medicine, Institute of Medical Physiology “Richard Burian”, University of Belgrade, Belgrade, Serbia

<sup>7</sup>Department of Pharmacology, Toxicology and Clinical Pharmacology, Faculty of Medicine, University of Banja Luka, Banja Luka, the Republic of Srpska, Bosnia and Herzegovina

Liraglutide (LIR) improves glycaemia, reduces body weight and has anti-atherosclerotic and anti-inflammatory effects. It improves endothelial function through NO-induced vasodilation and reduced oxidative stress. The aim of the study was to investigate the role of LIR on the isoprenaline (ISO)-induced myocardial injury (MI).

MI in Wistar rats was induced by subcutaneous injection of ISO at a dose of 85 mg/kg of body weight on two consecutive days. The experimental animals were divided into 4 groups: C group, control (received saline on days 1 and 2 + saline for 7 consecutive days), I group (ISO on days 1 and 2 + saline for 7 days), L group (saline on days 1 and 2 + LIR for 7 days) and L+I group (ISO on days 1 and 2 + LIR for 7 days). In this study, myocardial damage, oxidative stress and haemodynamic changes were evaluated.

ISO-induced MI was demonstrated by ultrasound findings of reduced myocardial contractility, increased concentrations of high-sensitive troponin I (hsTnI) and pathohistological changes. The results showed that LIR attenuated biochemical markers and oxidative stress parameters in ISO-induced MI, such as: aspartate aminotransferase (AST), alanine aminotransferase (ALT), thiobarbituric acid substances (TBARS), catalase (CAT) superoxide dismutase (SOD) and reduced glutathione (GSH). LIR also attenuated the ultrasound hemodynamic changes induced by ISO.

Treatment with LIR attenuated oxidative stress, myocardial damage, and haemodynamic changes in ISO-induced MI.

**Keywords:** liraglutide, isoprenaline, heart failure, oxidative stress, haemodynamic changes