LIRAGLUTIDE ATTENUATES ISOPRENALINE-INDUCED MYOCARDIAL INJURY AND APOPTOSIS IN RATS BY MODULATING WNT/β-CATENIN SIGNALLING PATHWAY

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β-adrenergic receptor stimulation with isoprenaline (ISO) induces substantial oxidative stress in the heart, leading to the infarct-like necrotic damage. During myocardial injury (MI) reactive oxygen species are generated, which causes cardiomyocyte apoptosis. The up-regulation of canonical Wnt/β-catenin pathway induces cardiac hypertrophy and fibrosis in the isoprenaline (ISO)-induced model of MI. The aim of this study was to clarify the role of cardioprotective effects of liraglutide (LIR), an antidiabetic glucagon-like peptide-1 (GLP-1) receptor agonist on ISO-induced myocardial pathological manifestations.

The rats in this study were randomly allocated to four groups: control (C) group, I group (physiological saline + ISO injection for two days at a dose of 85 mg/kg), L group (LIR for 10 days + physiological saline) and L+I group (LIR for 10 days + ISO on days 9 and 10). In order to produce an infarct-like necrotic damage, ISO injections were given to Wistar albino rats for two days. The expression of β-catenin, cyclin D1 and cleaved caspase-3 (a key apoptotic protein) was monitored using immunohistochemical detection.

The results of the present study suggest that pre-treatment with LIR significantly ameliorated ISO-induced MI in rats. It also decreased apoptotic marker expression, which subsequently resulted in the significant decrease in the expression levels of Wnt/β-catenin signalling pathway-associated molecules such as β-catenin and cyclin D1.

Our findings revealed that Wnt/β-catenin signalling pathway is a potential molecular target for LIR, what might be promising in the prevention of MI and apoptosis in cardiomyocytes.

Keywords: Liraglutide, Cardioprotection, Wnt/β-catenin, Cleaved caspase-3, Isoprenaline induced myocardial injury