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Effects of dapagliflozin against streptozotocin and isoproterenol-induced heart failure via investigating NLRP3 and PPAR-γ signaling

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Abstract: Heart failure is a condition in which the heart's one or both ventricles are unable to either receive an adequate amount of blood or eject an adequate amount of blood. Diabetes is considered one of the major risk factors for cardiovascular diseases. The current research is designed to evaluate the cardioprotective effects of dapagliflozin in streptozotocin and isoproterenol-induced comorbid rats. The COX-2, TNF-α, NF-KB, NLRP3, PPAR-γ, CKMB, TROP-I, AR, GP and SGLT were docked against dapagliflozin, propranolol and metformin. Dapagliflozin restored adequate blood flow and halted myofibril damage. Moreover, it's evident from this study that dapagliflozin significantly decreased serum concentration of various blood markers, decreased relative growth rate and QT interval prolongation, as compared to the negative control group. However, it improved the ventricular ejection fraction in rats of the treatment group. The GST, GSH and CAT levels were increased, as compared to normal. On the contrary, a decrease in LPO concentrations was observed. Evaluation of the coronal section of heart tissues showed the anti-inflammatory expressions evaluated through H & E staining and immunohistochemical techniques and with ELISA and PCR. In a nutshell, dapagliflozin reverses myocardial necrosis and apoptosis.

Keywords: Cardioprotective, Docking, dapagliflozin, ELISA, PCR.