

**EFFECT OF EMPAGLIFLOZIN AND ITS COMBINATION
WITH METFORMIN IN EXPERIMENTALLY INDUCED
MYOCARDIAL INFRACTION IN DIABETIC RATS**

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Effect of Empagliflozin and its combination with Metformin in experimentally induced myocardial infraction in Diabetic rats

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Abstract:

Objective: The objective of the present study was to evaluate cardio-protective effect of sodium glucose co-transporter-2 inhibitor alone and its combination with metformin in experimentally induced myocardial infarction in diabetic rats.

Method: Type 2 Diabetes was induced in rats by a single intraperitoneal (i.p) injection of Streptozotocin (65 mg/kg, STZ) in overnight fasting rats followed by the i.p administration of Nicotinamide (120 mg/kg, NIC) after 15 minutes. Animals were divided into five groups of each six animals. Group I served as normal control and received vehicle (0.5% hydroxy ethyl cellulose) for 4 weeks and normal saline subcutaneously on 29th and 30th days. Group II served as diabetic-myocardial control and received STZ-NIC (65-120mg/kg, i.p) and Isoproterenol (85mg/kg, sc) on 29th and 30th days. Group III received STZ-NIC, ISO and Empagliflozin 5mg/kg, po for 4 weeks. Group IV received STZ-NIC, ISO and Empagliflozin 10mg/kg, po for 4 weeks. Group V received STZ-NIC, ISO and Empagliflozin 5mg/kg + Metformin 50mg/kg, po for 4 weeks.

Group IV received STZ-NIC, ISO and Empagliflozin 10mg/kg, po for 4 weeks. Group V received STZ-NIC, ISO and Empagliflozin 5mg/kg + Metformin 50mg/kg, po for 4 weeks.

At the end of the treatment period, rats were anaesthetized with anaesthetic ether after 24hr of final drugs dose administration and then; blood was collected from the retro-orbital plexus for estimation of different biochemical parameters like blood glucose (BG), creatine kinase MB (CK-MB), lactate dehydrogenase (LDH), aspartate transaminase (AST), Troponin I and lipid profile.

Result and Discussion: Animals treated with the combination of Empagliflozin and Metformin showed significant inhibition in the elevated level of BG, CK-MB, LDH, AST, Troponin and lipid profile in diabetic animals compared to diabetic control (Group II) animals and Group III and IV animals receiving only Empagliflozin 5 mg/kg and 10 mg/kg respectively.

Conclusion: Empagliflozin by acting through sodium glucose co-transporter-2 and Metformin by acting through activation of the 5'-adenosine monophosphate-activated protein kinase (AMPK) pathway, when used in combination could have beneficial effects in preventing cardiovascular diseases (CVD) in type 2 diabetes as compared to individual drugs. It was found to decrease cardiovascular risk factors synergistically by Empagliflozin and Metformin combination in type 2 diabetes mellitus.

Keywords: Type 2 diabetes, cardiovascular disease, SGLT-2 transporter, Empagliflozin