

Protective effect of sitagliptin and whole body gamma irradiation in diabetes-induced cardiac injury

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Abstract

Diabetes mellitus is associated with an increased risk of cardiac complications; this study aimed to investigate effect of sitagliptin (SITA) alone or combined γ irradiation on diabetes-associated cardiac injury. Rats were treated with SITA (100 mg/kg per day; p.o.) for 2 weeks followed by a single dose of whole-body γ irradiation (3 Gy). Solitary administration of SITA or combined treatment γ irradiation succeeded to ameliorate the increase in serum levels of glucose, total cholesterol, triglycerides, creatine kinase-MB, and malondialdehyde, coupled by increased insulin and reduced glutathione levels. Their cardioprotective potential was confirmed through attenuating the apoptotic signaling by mitigating Bcl-2-associated X protein, caspase-3, and apoptosis-inducing factor expression, while augmenting the anti-apoptotic factors, B cell lymphoma-2 (Bcl-2), and heat shock protein 70 (HSP-70) in left ventricular tissue homogenates. These findings were supported histopathologically. In conclusion, treatment with SITA alone or γ irradiation may prove beneficial in diabetes-accompanied cardiac insult. This could be due to the crosstalk between the antioxidant, anti-apoptotic, and restoration of body's defense capacities.

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