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Effect of pretreatment with *Polyalthia longifolia var* (Annonaceae) on isoproterenol induced cardiotoxicity and cardiac hypertrophy in rats

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Objective: The objective of present study was to investigate the effect of pretreatment with *Polyalthia longifolia var* (Annonaceae) on isoproterenol induced cardiotoxicity and cardiac hypertrophy in rats.

Methods: Wistar rats (220-250 g) were randomly divided into five groups. Group I- was control (olive oil 2 mL/kg orally for 18 days and water IP from days 9–18); Group II- ISO (olive oil 2 mL/kg orally for 18 days and ISO 1 mg/kg IP from days 9–18); Group III (PL 300 mg/kg p.o for 18 days + ISO); Group IV- (PL 600 mg/kg p.o for 18 days + ISO); and Group V (CoQ_{10} 100 mg/kg p.o for 18 days + ISO). ISO 1 mg/kg IP was administered in group Groups II, III, IV, V from days 9–18). Twenty-four hours after the last dose of water or ISO, the rats were anesthetized and an ECG was recorded. Blood was withdrawn by retro-orbital puncture for estimation of serum creatine kinase-MB (CK-MB), lactate dehydrogenase (LDH) levels, and aspartate aminotransferase activities. The animals were euthanized using an overdose of ether. The hearts of 4 animals from each group were used for estimation of superoxide dismutase (SOD) activity, reduced glutathione (GSH) concentration, lipid peroxidation (LPO), malondialdehyde (MDA), and total protein concentration. Histopathology of the 2 remaining hearts in each group was carried out by a blinded technician.

Results: A total of 30 rats (6 in each group) were used in this study; all rats survived to study end. Compared with the control group, the ISO-treated rats had a significant change in heart to body weight ratio (P<0.001); significant changes in the endogenous antioxidants (ie, significantly higher myocardial MDA concentration [P<0.001]; significantly lower myocardial GSH concentration [P<0.001] and SOD activity [P<0.01]); and significantly higher serum activities of marker enzymes (eg, CK-MB [P<0.001] and LDH [P<0.001]). Compared with the ISO group, the PL 600 mg/kg + ISO group had a significant change in heart to body weight ratio (P<0.001); significant changes in the endogenous antioxidants (ie, significantly lower MDA concentration [P<0.05]; significantly higher myocardial GSH concentration [P<0.01] and SOD activity [P<0.01]); and significantly lower serum activities of marker enzymes (eg, CK-MB [P<0.05] and LDH [P<0.05]).

Conclusion: Pretreatment with PL 600 mg/kg for 18 days was associated with moderate protection against ISO-induced cardiotoxicity and cardiac hypertrophy and with lower myocardial injury by preserving endogenous antioxidants and reducing LPO in rat heart.

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