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A methanolic extract of *Marrubium vulgare* L. suppresses inflammatory responses in isoproterenol induced myocardial infarction in rat

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Background and Aims:*Marrubium vulgare* (Lamiaceae) is a medicinal herb and have been shown to have strong anti-inflammatory activities. The aim of the present study was to investigate the cardio protective effects of the methanolic extract of the plant on isoproterenol-induced acute myocardial infarction (MI).
Methods: Male Wistar rats were assigned to 6 groups of control, sham, isoproterenol, and treatment with 10, 20, and 40 mg/kg/12h of the extract given orally concurrent with MI induction. A subcutaneous injection of isoproterenol (100 mg/kg/day) for 2 consecutive days was used to induce MI. The heart hemodynamic properties and myeloperoxidase (MPO) activity were assayed by powerlab system and spectrophotometry respectively. Serum levels of inflammatory cytokines were measured by ELISA method. The myocardial histopathology properties were also studied.
Results: A subcutaneous injection of isoproterenol to rats (MI group; n=6; 100 mg/kg/day) for 2 consecutive days caused ST-segment elevation in ECG, left ventricular dysfunction, intensive myocardial fibrosis along with a profound increase in myocardial MPO activity and an increase in the serum levels of TNF- α. All doses of the extract significantly amended the ECG pattern and improved the left ventricular systolic pressure, contractility and relaxation (P<0.001). Interstitial fibrosis significantly was attenuated in treated groups compared with control MI group. Treatment with the extract also reduced serum levels of TNF- α (at least 40.35%) and myocardial MPO activity (at least 30.47%).
Conclusions: It is well known that inflammation plays a key role in the development of cardiovascular diseases. The results of our study demonstrated that a methanolic extract of *Marrubium vulgare* has strong protective effects against isoproterenol-induced myocardial infarction and this protection possibly is mediated through its anti-inflammatory actions.

Keywords: *Marrubium vulgare*; Inflammatory responses; Myocardial infarction