عنوان مقاله:

p-Coumaric acid protects cardiac function against lipopolysaccharide-induced acute lung injury by attenuation of oxidative stress

محل انتشار:

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خلاصه مقاله:

Objective(s): Acute lung injury (ALI) has a high mortality rate and is characterized by damage to pulmonary system giving rise to symptoms such as histological alteration, lung tissue edema and production of proinflammatory cytokine. p-Coumaric acid (p-CA), as a phenolic compound, that is found in many types of fruits and vegetables has been reported to exhibit a therapeutic effect in several inflammatory disorders. The aim of our study was evaluation of pretreatment with p-CA against heart dysfunction, oxidative stress and nuclear factor-erythroid 2 -related factor 2 (Nrf2) modifications following lipopolysaccharide (LPS)-induced acute lung inflammation. Materials and Methods: The rats were divided into four groups (n=8): Control, LPS (5 mg/kg, it), p-CA (100 mg/kg, IP), and LPS+pCA. Inflammatory response and oxidative stress were evaluated by measurement of interleukin 6 (IL-6), tumor necrosis factor alpha (TNF-α) and malondialdehyde (MDA) levels in heart tissue. For evaluation of the effect of LPS on cardiac response, electrocardiography (ECG) and hemodynamic parameters were recorded.Results: A significant increase in lipid peroxidation ($P<0.001$, cytokine parameters (TNF-α and IL-6 ($P<0.01$), gene expression of Nrf2 ($P<0.05$), and antioxidant activity of superoxide dismutase and glutathione ($P< 0.05$) in addition to glutathione peroxidase ($P<0.01$) was demonstrated in heart tissue of ALI rats. LPS can impair cardiac function (in in vitro measurement of hemodynamic parameters by using Langendorff setup, and in in vivo measurement of ECG parameters), and pretreatment with p-CA recovered these parameters to control levels in heart. Pretreatment with p-CA causes modulation of cytokines and MDA level that protected cardiac injury caused by LPS in ALI model. Conclusion: Our results showed anti-inflammatory and antioxidative effect of p-CA on LPS-induced ALI.

کلمات کلیدی:

ALI, ECG, Hemodynamic parameters, LPS, Nrf2, p-Coumaric acid