عنوان مقاله:

Ameliorative effects of silymarin on HCl-induced acute lung injury in rats; role of the Nrf-2/HO-1 pathway

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خلاصه مقاله:

Objective(s): Aspiration is a common cause of acute lung injury (ALI), which lacks an effective treatment. Inflammation and oxidative stress play key roles in ALI development. Silymarin is an active extract of Silybum marianum plant seeds (milk thistle). Silymarin has potent anti-inflammatory and antioxidant effects; however its role in aspiration induced ALI has not been investigated. The aim of this study is to investigate the role of silymarin in the treatment of hydrochloric acid (HCl) aspiration induced ALI and explores its mechanisms of action. Materials and Methods: The study included three groups of rats: Control non-treated group, ALI group (intra-tracheal HCl injected), and silymarin treated ALI group. White blood cells (WBCs) with differential count, oxidative stress parameters, B-cell lymphoma 2 (Bcl-2), transforming growth factor-beta (TGF-β), cyclooxygenase 2 (COX-2), nuclear factor erythroid 2-related factor-2 (Nrf-2), and heme oxygenase-1 (HO-1) were investigated. Lung tissue histopathology and immunohistochemical expression of survivin and proliferating cell nuclear antigen (PCNA) were also examined. Results: The results of the study showed that HCL caused histopathological changes in ALI with leukocytopenia and increased oxidative stress biomarkers. It increased TGF-β, up-regulated mRNA expression of COX-2, Nrf-2, and HO-1 and increased survivin and PCNA but decreased Bcl-2. Silymarin ameliorated the histopathological lung injury with further up-regulation of Nrf-2 and HO-1 mRNA and decreased the inflammatory and fibrotic parameters together with up-regulation of the anti-apoptotic and the proliferation parameters.Conclusion: The protective effect of silymarin against ALI is mediated by Nrf-2/HO-1 pathway with subsequent antioxidant, anti-inflammatory, antiapoptotic, and proliferating activities.

کلمات کلیدی:

Acute lung injury, Fibrosis, Heme oxygenase-1, Silymarin, Survivin