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Effects Of Juice And Seed Extract Of Pomegranate On Oxidative Stress, Inflammation, And Phosphorylation Of Erk1/2 In Paraquat-Induced Acute Lung Injury In Mice

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Pulmonary fibrosis is considered the most distinctive feature of paraquat (PQ) poisoning. Inflammation and oxidative stress play crucial roles in the pathogenesis of PQ-induced pulmonary fibrosis. The current study was designed to assess the efficacy of pomegranate juice (PJ) and pomegranate seed extract (PSE) supplementation against PQ-induced pulmonary fibrosis in a mouse model. Male mice (*Mus musculus*) were randomly divided into four experimental groups (n=8). Group 1 (control group) received 0.9% saline only; group 2 received a single intraperitoneal injection of PQ (30 mg/kg); and groups 3 and 4 were daily treated with PJ (5 mL, 1:40 dilution) or PSE (500 mg/kg body weight, suspended in distilled water), respectively, by gavage one week before the PQ injection, then continued for 3 weeks. PQ increased significantly the levels of hydroxproline, reduced nicotinamide adenine dinucleotide phosphate (NADPH) oxidase 4 (NOX4), nitric oxide (NO), malondialdehyde (MDA), and extracellular signal-regulated kinase 1/2 (ERK1/2) in the lung tissue compared with the control group. Furthermore, the levels of interleukins (IL-6 and IL-17), transforming growth factor (TGF)- β 1, and CC chemokine ligand 2 (CCL2) elevated significantly in the lung tissue due to PQ injection. Administration of PJ or PSE alleviated markedly the biochemical lung alterations caused by PQ injection. Additionally, PJ and PSE supplementation decreased the levels of IL-6, IL-17, TGF- β 1, and CCL2, as well as reduced significantly the phosphorylated (p)-ERK1/2, in PQ-treated mice. In conclusion, administration of PJ and PSE attenuated effectively PQ-induced lung injury in mice by modulating inflammation, oxidative stress, and fibrosis.

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