

Antioxidant Potential of Pomegranate Rind Extract Attenuates Pain, Inflammation and Bone Damage in Experimental Rats

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Abstract : Inflammation is an important physiological response of the body's self-defense system that helps in eliminating and protecting organism from harmful stimuli and in tissue repair. It is a highly regulated protective response which helps in eliminating the initial cause of cell injury, and initiates the process of repair. The present study was designed to evaluate the ameliorative effect of pomegranate rind extract on pain and inflammation. Hydroalcoholic standardized rind extract of pomegranate at doses 50, 100 and 200 mg/kg and indomethacin (3 mg/kg) was tested against eddy's hot plate induced thermal allgesia, carrageenan (acute inflammation) and Complete Freund's Adjuvant (chronic inflammation) induced models in Wistar rats. Parameters analyzed were inhibition of paw edema, measurement of joint diameter, levels of GSH, TBARS, SOD, TNF- α , radiographic imaging, tissue histology and synovial expression of pro-inflammatory cytokine receptor (TNF-R1). Radiological and light microscopical analysis were carried out to find out the bone damage in CFA-induced chronic inflammatory model. Findings of the present study revealed that pomegranate rind extract at a dose of 200 mg/kg caused a significant ($p < 0.05$) reduction in paw swelling in both the inflammatory models. Nociceptive threshold was also significantly ($p < 0.05$) improved. Immunohistochemical analysis of TNF-R1 in CFA-induced group showed elevated level, whereas reduction in level of TNF-R1 was observed in pomegranate (200 mg/kg). Henceforth, we might say that pomegranate produced a dose-dependent reduction in inflammation and pain along with the reduction in levels of oxidative stress markers and tissue histology, and the effect was found to be comparable to that of indomethacin. Thus, it can be concluded that pomegranate is a potential therapeutic target in the pathogenesis of inflammation and pain, and punicalagin is the major constituents found in rind extract might be responsible for the activity.

Keywords : carrageenan, inflammation, nociceptive-threshold, pomegranate, histopathology

Conference Title : ICMAP 2016 : International Conference on Medicinal and Aromatic Plants

Conference Location : Penang, Malaysia

Conference Dates : December 01-02, 2016