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Anti-Arthritic Effect of a Herbal Diet Formula Comprising Fruits of Rosa Multiflora and Flowers of Lonicera Japonica

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Abstract : Rheumatoid arthritis (RA) affects around 1% of the globe population. Yet, there is still no cure for RA. Toll-like receptor 4 (TLR4) signalling has been found to be involved in the pathogenesis of RA, making it a potential therapeutic target for RA treatment. A herbal formula (RL) consisting of fruits of Rosa Multiflora (Eijitsu rose) and flowers of Lonicera Japonica (Japanese honeysuckle) has been used in treating various inflammatory disorders for more than a thousand year. Both of them are rich sources of nutrients and bioactive phytochemicals, which can be used in producing different food products and supplements. In this study, we would evaluate the anti-arthritic effect of RL on collagen-induced arthritis (CIA) in rats and investigate the involvement of TLR4 signaling in the mode of action of RL. Anti-arthritic efficacy was evaluated using CIA rats induced by bovine type II collagen. The treatment groups were treated with RL (82.5, 165, and 330 mg/kg bw per day, p.o.) or positive control indomethacin (0.25 mg/kg bw per day, p.o.) for 35 days. Clinical signs (hind paw volume and arthritis severity scores), changes in serum inflammatory mediators, pro-/antioxidant status, histological and radiographic changes of joints were investigated. Spleens and peritoneal macrophages were used to determine the effects of RL on innate and adaptive immune responses in CIA rats. The involvement of TLR4 signalling pathways in the anti-arthritic effect of RL was examined in cartilage tissue of CIA rats, murine RAW264.7 macrophages and human THP-1 monocytic cells. The severity of arthritis in the CIA rats was significantly attenuated by RL. Antioxidant status, histological score and radiographic score were efficiently improved by RL. RL could also dose-dependently inhibit pro-inflammatory cytokines in serum of CIA rats. RL significantly inhibited the production of various pro-inflammatory mediators, the expression and/or activity of the components of TLR4 signalling pathways in animal tissue and cell lines. RL possesses anti-arthritic effect on collagen-induced arthritis in rats. The therapeutic effect of RL may be related to its inhibition on pro-inflammatory cytokines in serum. The inhibition of the TAK1/NF-κB and TAK1/MAPK pathways participate in the anti-arthritic effects of RL. This provides a pharmacological justification for the dietary use of RL in the control of various arthritic diseases. Further investigation should be done to develop RL into a anti-arthritic food products and/or supplements.

Keywords : japanese honeysuckle, rheumatoid arthritis, rosa multiflora, rosehip
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