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Modulation of disease related immune events by Curcumin, Demethoxycurcumin & Bisdemethoxycurcumin against autoimmune arthritis in rats

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Abstract

Curcumin, Demethoxycurcumin & Bisdemethoxycurcumin (DMC) are the main bioactive and stable constituents from the mixture of polyphenols, collectively referred as curcuminoids. The study aimed to investigate the anti-arthritic potential and possible mechanism of individual curcuminoids in Freund's complete adjuvant (FCA) arthritis rat model. Rat paw edema, body weight changes, alterations in hematological (Hb, RBC, WBC and ESR) & biochemical parameters were observed. ELISA analysis was performed to detect serumTNF-α, IL-1β, IL-6 & IL-10followed by real time RT-PCR for determining pro/anti-inflammatory markers in synovium tissue. Curcuminoids (60 mg/kg b.w.) significantly ameliorated paw swelling and regained the body weight loss. Also Curcuminoids treatment brought back the altered hematological and biochemical parameters comparable to non-immunized rats. Curcuminoids administration remarkably suppressed the overproduction and mRNA expression of TNF-α, IL-1β& IL-6 in contrast to IL-10 which was markedly increased by Curcuminoids treatment. Dramatic inhibition of histopathological and radiological changes caused by FCA injection was observed in Curcuminoids treated group. Taken together, the study demonstrates that DMC is an effective anti-arthritic fraction from the group of curcuminoids responsible for the anti-inflammatory and reparative effects which could be mediated via decrease in mRNA expression of TNF-α, IL-1β& IL-6 and increase of IL-10.