Topical delivery of curcumin-loaded transfersomes gel ameliorated rheumatoid arthritis by inhibiting NF-κβ pathway

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Aim: To fabricate and evaluate curcumin-loaded transfersomes (Cur-TF) for the targeted delivery and enhanced therapeutic efficacy of curcumin for the treatment of rheumatoid arthritis (RA).

Methods: Modified thin-film hydration method was used to prepare Cur-TF which were then embedded into carbopol- 934 gel. They were further evaluated through in vitro techniques for their physico-chemical techniques and in an in vivo in arthritis model for their pharmacological activities.

Results: Cur-TF had optimal particle size, spherical morphology, high encapsulation efficiency and sustained drug release profiles. The Cur-TF gel had better in vitro skin penetration than plain curcumin. In vivo findings demonstrated improved clinical, histological and x-ray scores and reduced pro-inflammatory cytokines through NF-κβ inhibition.

Conclusion: Cur-TF gel delivered curcumin to the arthritic dermal tissue through a topical route and demonstrated promising therapeutic efficacy by significantly alleviating complete Freud’s adjuvant (CFA)-induced arthritis.