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Anti-inflammatory, anti-nociceptive and anti-arthritic effects of antidepressants in rats

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Objective & Design: The purpose of this study was to evaluate the anti-inflammatory, anti-arthritic and analgesic effects of antidepressants.

Methods: Carrageenan model was used to assess effect on acute inflammation. Paw volume were measured at 1, 2, 3 and 4th hour post challenge. Anti-nociceptive effect was evaluated by hot plate method. Chronic inflammation was developed using Complete Freund's Adjuvant (CFA). The animals were injected with Freund's adjuvant in sub-plantar tissue of the right posterior paw. Paw volume, ankle flexion scores, adjuvant-induced hyperalgesia and serum cytokine levels were assessed.

Results: Results obtained demonstrate that mirtazapine, venalfaxine and escitalopram significantly and dose-dependently inhibited carrageenan-induced rat paw oedema. Mirtazapine, venalfaxine and escitalopram increased the reaction time of rats in hot plate test. We observed an increase in paw volume, ankle flexion scores, thermal hyperalgesia, serum levels of interleukin-1β, PGE2 and TNF-α, induced by intraplantar CFA injection. Regular treatment up to 28 days of adjuvant-induced arthritic rats with mirtazapine, venalfaxine and escitalopram showed anti anti-inflammatory and analgesic activities by suppressing the paw volume, recovering the paw withdrawal latency, and by inhibiting the ankle flexion scores in CFA-induced rats. In addition, significant reduction in serum levels of interleukin-1β, PGE2 and TNF-α level in arthritic rats was reduced by treatment with drugs.

Conclusion: These results suggest that antidepressants have significant anti-inflammatory and anti-nociceptive effects in acute and chronic models in rats, which may be associated with the reduction of interleukin-1β, PGE2 and TNF-α levels.

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