

The Antioxidant and Antinociceptive Effects of Curcumin in Experimentally Induced Pain in Rats

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Abstract : The nutraceutical compound Curcumin (*Curcuma longa* L.) is known for its anti-inflammatory, anti-cancer, and antioxidant effects. This study aimed to evaluate the antioxidative and analgesic effects of Curcumin (CC) compared to Tramadol (T) in chemical-induced nociceptive pain in rats. Thirty-five rats were randomly divided into five groups of seven rats each and were treated as follows: C group (control group): treated with saline solution 0.9%, (1 ml, i.p. administration), ethanoic acid (EA) group: pretreated with saline solution 0.9% - 30 min before EA nociceptive pain induction, (1 ml, i.p. administration), T group: pretreated with Tramadol, 10 mg/kg body weight (bw), i.p. administration - 30 min before EA nociceptive pain induction, CC1-group: pretreated with 1 mg/100g bw Curcumin i.p. administration - 2 days before EA pain induction and CC2-group: pretreated with Curcumin 2 mg/100g bw i.p. administration - 2 days before EA nociceptive pain induction. The following oxidative stress parameters were assessed: malondialdehyde (MDA), nitric oxide (NOx), total oxidative status (TOS), total antioxidative capacity (TAC), and thiol (Th). The antalgic activity was measured by the ethanoic acid writhing test. Treatment with Curcumin, both 1 mg/100g bw, and 2 mg/100g bw, showed significant differences as compared with the control group ($p < 0.001$) regarding malondialdehyde (MDA), nitric oxide (NOx), and total oxidative status (TOS) oxidative biomarkers. Pretreatment with 2 mg/100g bw of Curcumin presented a significant decrease in MDA values compared with Tramadol ($p < 0.001$). The TAC significantly increased in pretreatment with Curcumin compared with group control. ($p < 0.001$) The nociceptive response to EA was significantly reduced in Curcumin and Tramadol groups. Treatment with Curcumin at a higher concentration was more effective. In an experimental pain model, this study demonstrates an important antioxidant and antinociceptive activity of Curcumin comparable with Tramadol treatment.

Keywords : curcumin, nociception, oxidative stress, pain

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