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NMDA RECEPTOR ANTAGONISTS AS ANALGESICS IN A RAT MODEL OF VISCERAL PAIN

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INTRODUCTION: N-methyl-D-aspartate (NMDA) receptors are ligand-gated receptor complexes that have been associated with learning and memory, pain transmission, depression, schizophrenia and neurodegenerative disorders. In these processes deficiency of magnesium has a significant role. Magnesium and MK-801, noncompetitive NMDA receptor antagonists, have been demonstrated analgesic efficacy against neuropathic pain, but there are no data about the effects of these compounds on visceral pain.

OBJECTIVE: Comparison of the analgesic activity of NMDA antagonists against visceral inflammatory pain.

AIM: This study aimed at evaluating the effect of magnesium sulphate (MS) and MK-801 in writhing test in rats.

METHODS: In writhing test, a model of visceral inflammatory pain, injection of diluted acetic acid into the peritoneal cavity of male Wistar rats induced pain. MS and MK-801 were given subcutaneously 15 min before the intraperitoneal injection of 0.7% acetic acid.

RESULTS: MS at doses of 5 and 15 mg/kg did not affect the number of writhing in rats, but doses of 30 and 45 mg/kg significantly potentiated writhing 2.9 and 2.4 times, respectively. MK-801 (0.005 and 0.01 mg/kg) produced dose-dependent antinociception manifested as reduction in the number of writhing and the maximum antinociceptive activity was 61.3%.

CONCLUSIONS: MK-801 in the writhing test produced antinociception likely due to the inhibition of NMDA receptors. Effect of magnesium was different from MK-801. MS did not inhibit and even aggravated pain evoked by chemical stimuli in visceral pain test. The present results suggest that the MS may not be useful systemic analgesic in the therapy of visceral inflammatory pain.

Key words: visceral pain; acetic acid; magnesium sulphate; MK-801; NMDA receptor antagonist;

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