



## Interaction of memantine and ketamine in morphine- and pentazocine-induced antinociception in mice

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### **Abstract:**

The interaction between uncompetitive NMDA receptor antagonists (memantine and ketamine), and morphine ( $\mu$ -opioid receptor agonist) and pentazocine ( $\kappa$ -opioid receptor agonist) was studied in the writhing test in mice. Memantine and ketamine, administered at subthreshold doses, potentiated antinociceptive effect of the threshold (1 mg/kg) dose of morphine. The effects of the threshold (6 mg/kg) dose of pentazocine were not significantly changed by ketamine, and were significantly enhanced by the higher dose of memantine (15 mg/kg). Simultaneously performed experiments in the chimney test have shown that combination of morphine or pentazocine with an NMDA receptor antagonist did not induce significant alterations in the motor coordination of mice.

The obtained results have shown that NMDA receptor antagonists (ketamine, memantine) are able to enhance the antinociceptive activity of opioids (morphine, pentazocine). It is necessary to underline that this effect was more apparent for morphine ( $\mu$ -opioid receptor agonist) + NMDA antagonists than for pentazocine ( $\kappa$ -opioid receptor agonist). These results may have some importance for clinical practice.

### **Key words:**

memantine, ketamine, morphine, pentazocine, antinociception, mice

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