Magnesium Sulphate increases Ketamine analgesic effect in a rat model of incisional pain

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Abstract:

Effective control of postoperative pain is an important concern for both the patient and the physician. Optimization of analgesia with reduction of side effects lead to better outcomes. Unfortunately, this issue remains a challenge. The aim of this study is to determine whether a low dose of systemic magnesium sulfate can synergize the analgesic effect of ketamine in rats and whether this combination can decrease the side effects of ketamine. Adult male Wister rats were assigned into five groups. Group I was kept as normal animals and received no treatment. The surgical animals (incisional pain model was done by a 1-cm planter incision) were divided into four groups (n=10 for each group), group II: received saline, group III: received i.p ketamine 5mg/kg, group IV received s.c. magnesium sulphate 5mg/kg, group V received i.p ketamine 5mg/kg combined with s.c. magnesium sulphate 5mg/kg. Mechanical hyperalgesia and allodynia were assessed by analgesimeter and von Frey apparatus pre- and post-drug administration. Also, the rotarod apparatus was used to verify the effect of ketamine-magnesium combination on motor impairment. Single administration of ketamine or magnesium sulphate didn't produce any significant antinociceptive effect. However, significant antinociception was revealed when they were concomitantly administered. Also, this combination didn't produce any motor impairment. In conclusion, sole administration of ketamine and magnesium sulfate at the assigned doses didn't inhibit nociception in rats, but their combination produced synergistic antinociception with no sedative effects.

Keywords:

Magnesium, ketamine, incisional pain, rats

Published In:

EJBPS , Volume 5, Issue 4 , 63-68