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Intraventricular gabapentin is antinociceptive and enhances systemic morphine antinociception in rat tail flick test

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Abstract:

Background: Gabapentin has been recently considered as an analgesic in neurpathic pain through spinal site of action. In addition co-administration of low dose of morphine with gabapentin, is proposed not only to reduce side effects, tolerance, and dependency of morphine but also has some analgesic effects.

In this study, the analgesic effect of intracerebroventricular (ICV) gabapentin and its effect on morphine antinociception were investigated in tail-flick test.

Methods: An intraventricular cannula was surgically inserted into ventricle space of rat brain. The latency time was measured after microinjection of 100,300,600 and 1000 µg of gabapentin or normal saline (sham). After determination of subanalgesic dose of gabapentin (300µg), the combinational groups received subanalgesic and low dose of morphine (2 and 7 mg /kg) intraperitoneally, thirty minutes prior to gabapentin administration. Time response curve and Area Under the Curve (AUC), as antinociceptive index, were compared among the groups.

Results: Intraventricular gabapentin showed analgesic effects at 600 µg (ICV). The combination of subanalgesic doses of gabapentin (300 µg ICV) and morphine (2 mg /kg i.p) increased significantly time-response curve and AUC compared to other groups. In addition, the analgesic response following co-administration of gabapentin (300 µg ICV) and analgesic dose of morphine was increased significantly compared to the sham and gabapentin group.

Conclusion: The results demonstrated that intraventricular gabapentin has analgesic effect in transient model of pain and enhances morphine antinociception through cerebral site of action.

Keywords:

Intraventricular ، Gabapentin ، Tail- flick

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