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"Interaction of different doses of Aspartame with Morphine-induced antinociception in the presence of MK-801, a NMDA antagonist "

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Abstract:

This study was designed to investigate the relative role of sweetness and comparative effects of different taste sensation of the non - caloric sweetener , aspartame on pain and its interaction with MK - 80] as a non - selective MMDA antagonist by formalin - test in mice. The formalin - test was chosen because it measures the response to a long - lasting nociceptive stimulus and closely resembles to the clinical pain. Morphine induced a dose dependent antinociception in the early and late phases of formalin test. Twelve days pretreatment of animals by aspartame (0.08% , 0.16% , 0.32%) significantly potentiated morphine - induced (1.5-9 mg/kg) analgesia in the early phase but significantly antagonized its analgesic effect in the late phase, dose dependently. Aspartame (0.16%) alone showed a reduction in pain response . Naloxone (0.4 mg/kg) significantly antagonized the antinociceptive effect of morphine in the presence of aspartame (0-0.32%) in the early phase. Increasing the dose of aspartame decreased effects of naloxone. MK-801 (0.1 mg/kg) as an N- Methyl - D - Aspartate (NMDA) antagonist significantly potentiated the effect of aspartame on morphine - induced antinociception in the early phase. In the late phase, naloxone (0.4 mg/kg) increased pain response but MK-801 (0.1 mg/kg) induced anti-inflammatory effect significantly. Treatment of animals with MK- 801 alone, significantly induced analgesia in both phases of formalin - test. This effect was potentiated with aspartame dose - dependently. Possible interaction of aspartame with NMDA receptors and its role to facilitate endogenous opioid system are proposed mechanisms of aspartame in modulating morphine - induced antinociception. Furthermore, the resulting association between morphine and aspartame chronic consumption may be explained as an interactive action rather than simple dose combination of both drugs.

Keywords:

Antinociception ، Morphine, Aspartame, Sweetening agents, NMDA

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