

Abstract ID: 27865

Presentation Type: Poster

The effect of naloxone administration on CuCl₂ treatment effect on the chemical pain induced by formalin in male Wistar rat

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Background and Aim : Micronutrients are necessary for human bodies and involved in different reaction and biochemistry process. Reduction or increase in the amount of micronutrients can disrupt normal function of the body. Different micronutrients such as Mg²⁺, Mn²⁺, Zn²⁺ and Cu²⁺ affect the central nervous system and may be effective in pain and inflammation. Our previous study has shown that effective dose of CuCl₂ which caused analgesia subsequent to chemical pain induced by formalin in rat paw is 10 mg/kg dose. In this study the effect of naloxone on CuCl₂ analgesic effects was assessed to find any relationship between CuCl₂ analgesia and opioid system was assessed.

Methods : Adult male Wistar rats (200–250 g) were used in this study. Animals were divided into 4 groups (control, sham (naloxone), CuCl₂ and CuCl₂+naloxone treating animals). Drugs all intra peritoneal injected and pain behavior was assessed by formalin test and data were analyzed statistically.

Results : Pain behaviors in control and sham (naloxone) animals due to formalin paw injection were alleviated in CuCl₂ (10mg/kg, ip) treated animals ($p < 0.0001$, $p < 0.0001$) while naloxone in [CuCl₂ (10mg/kg) +Naloxone (2mg/kg, ip)] animals reversed the CuCl₂ analgesia ($p < 0.0001$).

Conclusion : At our previous study it was discussed that copper ions can possibly interfere with opioid system. So increasing the sensitivity of opioid receptors to endogenous opioids in the presence of Cu ion is suggested here to investigate, because, naloxone administration convert the CuCl₂ analgesia.

Keywords : Copper Chloride, analgesia, chemical pain, inflammation