

## Carbenoxolone attenuated morphine-induced withdrawal syndrome in rat

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**Background and Aims:** The exact mechanisms of dependence of morphine induced and withdrawal syndrome remains unclear. To identify a drug that can prevent withdrawal syndrome, many studies have been performed. The aim of this study was to evaluate the effect of carbenoxolone as a gap junction inhibitor on morphine withdrawal syndrome in male rat.

**Methods:** Adult male Sprague dawly rats (225 – 275 g) were selected (n=8) randomly and divided in to eight groups: In order to induce dependency, Morphine was administered subcutaneously at an interval of 12 h for nine days. Day 1: 5mg/kg/12h, Day 2,3: 10 mg/kg/12h, Day 4,5: 15 mg/kg/12h, Day 6,7: 20 mg/kg/12h, Day 8,9: 25 mg/kg/12h. On ninth day only the morning dose of morphine was injected, then saline (1 ml/kg, ip) or carbenoxolone (5, 25, 50, 100 mg/kg, ip) were injected after 30 min and half hour later, naloxone (4 mg/kg, ip) injected and the withdrawal signs including: Jumping, Rearing, Genital grooming, Abdomen writing, Body grooming and Wet dog shake, were recorded for 60 minutes.

**Results:** Our Results showed that carbenoxolone decreased all withdrawal signs, also it could attenuate the total withdrawal scores, significantly.

**Conclusions:** In conclusion we found that carbenoxolone as a gap junction inhibitor prevented the precipitated withdrawal syndrome.

**Keywords:** Carbenoxolone; Morphine; Withdrawal syndrome; Dependency