

## Preventive effect of grapefruit juice (Citrus Paradisi Macf.) on morphine withdrawal symptoms in male rats

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### Abstract

**Background & Objective:** Addiction to opiates such as morphine is one of major public health problems. It has been shown that in addicted animals, administration of antioxidant agents such as vitamin C can reduce the withdrawal symptoms (WDS). The aim of this study was to evaluate the preventional effect of grapefruit juice (Citrus Paradisi Macf.) on withdrawal symptoms in rats.

**Materials & Methods:** In this experimental study, Sixteen male Wistar rats (250-300g) randomly divided into two groups (n=8). All animals were addicted by intraperitoneal (i.p) injection of morphine (the 1-3 days: 10 mg/kg, the 4-6 days: 20 mg/kg and the 7-9 days 40 mg/kg; daily) for 9 days. The first group received 2 ml Citrus Paradisi Macf. orally 1 hour before morphine administration. The sham group received 2 ml of normal saline. Naloxone (10mg/kg, s.c) was administrated 45 minutes after of an additional dose of morphine (40 mg/kg) in the tenth day for withdrawal symptoms inducing. Then withdrawal symptoms such as frequency of wet-dog shaking, teeth chattering, defecation and penis licking were evaluated for 30 minutes.

**Results:** All withdrawal symptoms including frequency of wet-dog shaking, teeth chattering, defecation and penis licking were reduced in the Citrus Paradisi Macf. group in comparison with the sham group significantly (p<0.05).

**Conclusion:** Our results showed that presumably antioxidant activity of Citrus Paradisi Macf. can reduce withdrawal symptoms. Although the exact mechanisms of its effect in brain need to be elucidate.

**Key Words:** Grapefruit juice, Morphine, Withdrawal symptoms, Rat

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