

Abstract of the Ph.D. thesis No, The faculty of veterinary medicine of Urmia University. The academic year 2023-2024

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Title of thesis: Involvement of peripheral and central opioidergic, cholinergic, noradrenergic and cannabinergic mechanisms on thymoquinone function in a model of acetic acid-induced visceral pain in rats.

Abstract:

Pain is main factor that warded patient to hospital and is goal of the patient-dotor requestion. Herbal remedies of visceral pain have been deployed due to the complexity of etiology of visceral pains and the failures of their pharmacotherapy. Black cumin and its seeds is one of the most effective and common herbs in the treatment of visceral pain. Considering the spread of the use of black seed for the treatment of visceral pain, this research was planned and carried out in rats to investigate some of the mechanisms of action of the effective substance of this black cumin, thymoquinone. 90 rats were divided into 15 groups (n=6 in each) and used for intraperitoneal administration. These animals were used 20 days later for intraventricular injection again. Visceral pain evoked by intraperitoneal injection of 1% acetic acid was evaluated. The number of abdominal writhing responses was evaluated as the main parameter of visceral pain in 5-minute time blocks. Evaluation of visceral pain, in addition to the control, sham, and thymoquinone treated groups, was evaluated in the groups administered of antagonist of opioidergic, cannabinergic, cholinergic, and adrenergic systems by naloxone, AM251, atropine, and yohimbine, respectively. The analgesia of thymoquinone following the administration of the mentioned antagonists was evaluated. To evaluate the involvement of peripheral and central receptors of the mentioned neurotransmitter systems, administration of the antagonists was done peripherally (intraperitoneal, IP) and centrally (intraventricular, ICV). The results were analyzed with the statistical method of analysis of variance (ANOVA) and appropriate post hoc tests. The analysis of the results showed that thymoquinone with a concentration of 10 mg/Kg caused significant analgesia after the injection of 1% acetic acid (IP). Administering the mentioned antagonists peripherally and centrally ceased the effects of thymoquinone-induced analgesia, while administration of the mentioned antagonists alone had no effect on visceral pain evoked by acetic acid. The effect of peripheral administration of antagonists was stronger than the effect of their central administration. The effect of antagonists and thymoquinone on locomotor activity in the open field was also evaluated. Thymoquinone and the antagonists alone and antagonists after thymoquinone had no significant effect on motor activity. In conclusion, it seems that thymoquinone exerts an alleviating effect on visceral pain by employing multiple mechanisms.

Key words:

Visceral pain, Thymoquinone, Naloxone, Atropine, Yohimbine, AM251

