

## **Abstract**

**Introduction:** cytarabine is an anti-metabolic and anti-neoplastic substance used in the treatment of a variety of leukemia. The use of this drug is associated with complications such as fever, muscle aches and bone and nerve toxicity. Nervous toxicity is an unusual but destructive complication in its use, which may vary from sleepiness and ataxia to even seizures and death. The purpose of this study was to investigate the protective effect of thymoquinone composition, an essential oil in a black seed , in inhibiting nerve toxicity caused by cytarabine in rats.

**Materials and Methods:** In this study, 20 male Sprague-Dawley male rats were prepared and randomized and divided into four groups including control group, cytarabine recipient, recipient group, Thymoquinone recipient group and cytarabine. Then Thymoquinone was injected intraperitoneally with a dose of 0.5 mg for 10 days and then cytarabine with 70 mg for 5 days. 24 hours later, the brain tissue of rats and mitochondrial parameters such as SDH, oxidative stress and histopathologic damage were investigated.

**Results:** The results show that intraperitoneal injection of thymoquinone can compensate for the effects of cytarabine in rats and improve mitochondrial parameters such as MMP, ROS levels of AChe enzyme, lipid peroxidation, mitochondrial membrane damage In general, the result was that cytarabine causes mitochondrial disorder and Thymoquinone can inhibit significantly destructive effects.

**Discussion and Conclusion:** Based on the results, it can be argued that the composition of thymoquinone with having antioxidant properties in inhibiting neuronal toxicity caused by cytarabine in rats is a good protective effect.

**Key words:** Thymoquinone, Neural Toxicity, cytarabine, Mitochondria, Oxidative Stress