

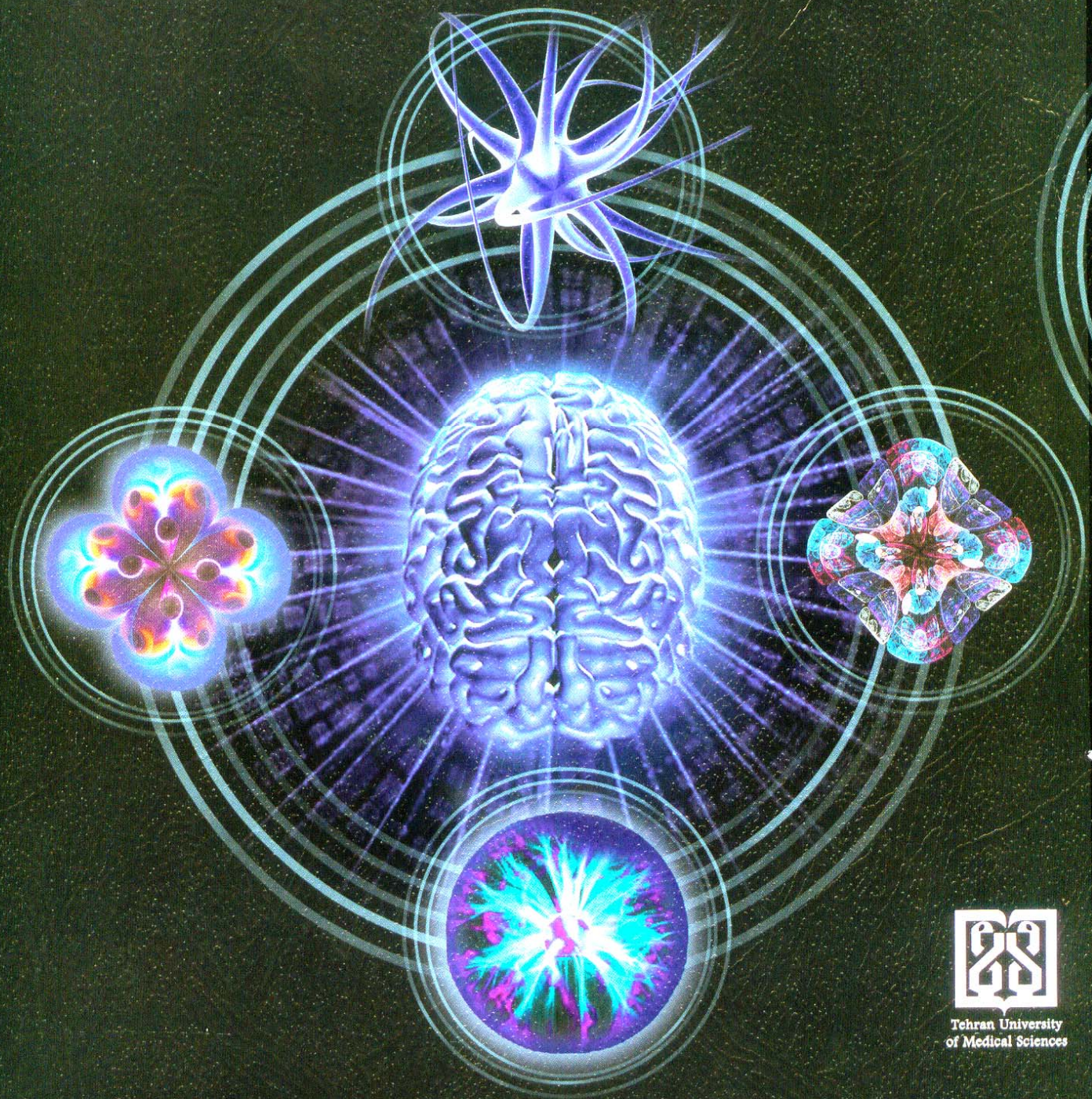
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Introduction: Ascorbic acid (AA) is a water-soluble antioxidant vitamin with acidic pH, which is highly concentrated in the brain. It is considered that AA is not only a simple antioxidant but also a neuromodulator in the central nervous system. Our hypothesis was the decreasing effect for AA on thermal pain sensation regardless of its acidity; therefore we investigated it in this research.

Methods: Male Wistar rats (200-250g) were used. Groups included control, sham-saline, AA (OSVAH pharma. Co. Tehran-Iran) 2mg/ml and neutralized AA 2mg/ml (all drugs were injected at 10 μ l volume intrathecally). Thermal nociception threshold was measured prior and 5 minutes after treatments, using Tail Flick test.

Results: AA showed increasing effect on thermal pain sensation in 2mg/ml ($p < 0.001$) interestingly and neutralized AA 2mg/ml reduced thermal pain compared to AA 2mg/ml ($p < 0.05$) dose.

Conclusion: In spite of the hypothesis, AA increase thermal pain sensation in Tail Flick test. However neutralized AA can decrease thermal pain in comparison with AA. Probably acidic PH has role in pain sensation. Presumably AA has involved in pain transferring facilitation, by A δ fibers which have roles in thermal pain reflexes, or in facilitating Glutamate effects by non NMDA receptors such as AMPA; which needs more research.

Key words: Ascorbic acid, thermal pain, intrathecal injection, Tail Flick test



✓ The Effect of Intrathecal Administration of Ascorbic Acid on Chemical Pain Sensation During Formalin Test in Rat

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Introduction: Ascorbic acid (AA) is an essential micronutrient with acidic pH, it can block a variety of membrane bound receptor proteins including the NMDA site receptors which is important in pain signaling. The hypothesis was a decreasing effect of AA on chemical pain sensation regardless of its acidity; therefore we investigated it in this research.

Methods: Male Wistar rats (200-250g) were used. Groups included control, sham-saline, AA 2mg/10 μ l and neutralized AA 2mg/10 μ l (all drugs were injected intrathecally). 5 minutes after treatment, 0.05ml formalin 2.5% was injected in left paw and in one hour the pain responses of rats were recorded.

Results: AA has reducing effects on first, interphase and second stages of formalin test, in 2mg/10 μ l dose ($p < 0.001$) and neutralized AA 2mg/10 μ l dose ($p < 0.001$).

Conclusion: Effects of AA on chemical neurogenic and inflammatory pain is significant. Although AA has acidic pH, regarding to the results it is reasonable to conclude, its effect is not due to its acidic property. Presumably AA with blockage of NMDA receptors, decreases the pain, which needs to clarify more.

Key words: Ascorbic acid, pain, intrathecal injection, formalin test.

