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Acta Medica Iranica
2009;47(4) : 116-119

Sex affects the feeling of pain in the mice, possible involvement of nitric oxide

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Abstract:

It has been shown that nitric oxide is a mediator with a major role in pain signaling at the level of dorsal root ganglion neurons of the spinal cord. The main objective of the present study was to elucidate the influence of sex on the effects of nitric oxide on pain mediation in mice. Painful stimuli such as heat induced by light beam focused on tail and hot plate chamber were applied. Animals were injected with either morphine (0.5, 5 and 50 mg/100g body weight) or L-NAME (0.1, 0.5 and 1 mg/100g body weight) intraperitonealy. Changes in tail flick latency and responses to the hot plate chamber were measured in different groups of mice. The tail flick latency was increased significantly in both male and female animals treated with morphine (control male (sec): 2.45 ± 0.16, male which received morphine 50 mg/100g body weight: 13.5 ± 0.6, control female: 3.4 ± 0.3, female which received morphine 50 mg/100g body weight: 13.8 ± 0.6; P<0.001 vs control in both cases). The response time to the hot plate chamber was also increased significantly by morphine pretreatment in both male and female mice. The tail flick latency and the response time to the hot plate chamber were significantly higher in the female mice (eg,the response time to the hot plate chamber (sec) in male: 7.3 ± 0.8, in female: 13.7 ± 1.6, P<0.01 vs female mice). Pretreatment with L-NAME at all concentrations caused a significant non-dose dependent increase in the response time to the hot plate chamber only in the male mice. These results may suggest that pain is mediated through different mediators in male and female mice and probable involves sex hormones. Furthermore, from the effect of L-NAME on pain sensation, it maybe suggested that Larginine-nitric oxide pathway is more important in male in comparison with female in pain signaling.

Keywords:

Pain

TUMS ID: 1668

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