Protective effect of alprazolam in acute immobilization stress-induced certain behavioral and biochemical alterations in mice

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Abstract:
Stress can be viewed as a cause of adverse circumstance that induces a wide range of biochemical and behavioral changes. Oxidative stress is a major contributor to the genesis of neurodegenerative and neuropsychiatric problems. In the present study, we investigated the protective effect of alprazolam in acute immobilization-induced various behavioral and biochemical alteration in mice. Mice were immobilized for a period of 6 h. Alprazolam (0.25 and 0.5 mg/kg, ip) was administered 30 min before subjecting the animals to acute stress and several behavioral (mirror chamber, actophotometer, tail flick test) and biochemical tests (malondialdehyde level, glutathione, catalase, nitrite and protein) were performed. Acute immobilization stress for a period of 6 h caused severe anxiety, analgesia and decreased locomotor activity in mice. Biochemical analyses revealed an increase in malondialdehyde, nitrite level and depleted glutathione and catalase activity in stressed brain. Pretreatment with alprazolam (0.25 and 0.5 mg/kg, ip) significantly reversed immobilization stress-induced anxiety, analgesia and impaired locomotor activity. Biochemically, alprazolam pretreatment decreased malondialdehyde, nitrite activity and restored reduced glutathione level and catalase activity. These results suggest that alprazolam has a neuroprotective effect and can be used in the treatment and management of stress and related disorders.

Key words: alprazolam, immobilization stress, lipid peroxidation, anxiety, analgesia, locomotor activity