

**Abstract of DVM Thesis No. 6926, Urmia University**

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**Title of Thesis:**

**Effect of Moderate-intensity Exercise Training Protocol on Ketamine-induced Adverse Impacts on Heat Shock Protein 70 Expression and Chromatin Condensation in Testicular Tissue of Mature Male Rats**

Recreational ketamine (KET) abuse has been extremely increased worldwide making further studies focusing on its chronic toxicity in various organs inevitable. The present study was mapped out to shed light on the effect of moderate-intensity exercise training (MIET) protocol on KET-induced adverse impacts on heat shock protein 70 (HSP70) expression and chromatin condensation in testicular tissue of mature male rats. Twenty-four adult male Wistar rats were divided into four equal groups including non-treated control group, KET group receiving 50 mg/kg/day KET intraperitoneally (IP) for 8 weeks, withdrawal group receiving KET (50 mg/kg/day; IP) for 8 weeks followed by a 8-week drug-free period and KET-MIET group receiving KET (50 mg/kg/day; IP) for 8 weeks followed by a 8-week MIET (moderate-intensity running on a treadmill once daily (5 days/week)). The 8-oxo-dg, HSP70 and HSP90 synthesis and HSP70, HSP90, transition nuclear protein 1 (TP1) and TP2 mRNA levels in testicular tissue were analyzed using immunohistochemistry and reverse transcription polymerase chain reaction techniques, respectively. Oxidative stress index (OSI) level was also examined in testicular tissue. The MIET down-regulated 8-oxo-dg, HSP70 and HSP90, up-regulated TP1 and TP2 and reduced OSI level compared to KET and withdrawal groups. These findings demonstrate that MIET is able to attenuate KET-induced adverse effects on HSP70 and HSP90 expressions and chromatin condensation (TP1 and TP2 expressions) and reinforce anti-oxidant defense system in testicular tissue of mature male rats.

**Keywords:** Chromatin; Exercise; Heat Shock Protein; Ketamine; Rat; Testis