Summary of the DVM thesis No: 25964, Faculty of Veterinary Medicine, Urmia University. The academic year: 2024
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Title of thesis: Effects of protocatechuic acid (3,4-dihydroxybenzoic acid) on ischemia-reperfusion injury in a mice testis model

Summary:

Testicular torsion/detorsion (T/D) is a medical condition that may cause testicular damage, changes in hormone production, and infertility in men. Protocatechuic acid (3,4-dihydroxybenzoic acid) is a phenolic compound found in many fruits such as plums, grapes and nuts. This biologically active compound is known for its many biological and pharmacological properties such as antioxidant, antibacterial, anti-inflammatory, anti-cancer, etc. The aim of this study was to investigate the protective effects of protocatechuic acid on testicular ischemia-reperfusion injury in testicular torsion/detorsion. 20 healthy male mice were divided into four groups: control, 720 degrees torsion/detorsion, 720 degrees torsion/detorsion + 7.5 mg/kg PCA and 720 degrees torsion/detorsion + 30 mg/kg PCA. After 2 hours of induction of 720 degrees testicular torsion in the clockwise direction, sperm parameters were investigated. The findings indicated that 720° T/D could lead to increased DNA damage, and reduced sperm total motility, viability, and plasma membrane functionality (PMF). Moreover, the findings suggest that PCA intake in torsion/detorsion mice can help reduce DNA damage. Also, administration of PCA increased the percentage of sperm total motility, viability and PMF. In conclusion, this study demonstrates that administration of PCA after spermatic cord torsion in mice provides significant protection against severe testicular torsion/detorsion injury.

Keywords: Ischemia-reperfusion, Protocatechuic acid, Testis, Mice