Title of thesis: Effects of intraperitoneal administration of selenium nanoparticles on ischemia-reperfusion injury in mice testicular torsion and detorsion model

Summary:

Testicular ischemia-reperfusion (I/R) injury during testicular torsion is greatly influenced by oxidative stress due to an excess of un-scavenged reactive oxygen species. This research aimed to explore the impact of selenium nanoparticles (SeNP) on I/R injury in testicular torsion/detorsion (T/D) in male mice. Twenty male mice were divided into 5 groups: a sham group, a control group and 3 treatment groups (720° T/D, 720° T/D + 0.25 mg/kg SeNP, 720° T/D + 0.5 mg/kg SeNP, and 720° T/D + 1 mg/kg SeNP). After inducing 720° clockwise testicular torsion for 2 hours, sperm parameters were assessed. 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 results demonstrated that the administration of SeNP to T/D mice could decrease DNA damage. SeNP administration (0.5 and 1 mg/kg) also enhanced sperm total motility, viability, and PMF. In conclusion, high doses of SeNP, when given post-spermatic cord torsion in mice, offer significant protection against acute testicular T/D injury.

Keywords: Ischemia-reperfusion injury, Testis, Selenium nanoparticles, Mice