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### Effect of neonatal thymectomy on reproductive and sperm mitochondrial characteristics in sprague-dawley rats

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This study investigated the role of thymus on reproductive traits, and on mitochondria as the targets of immunosuppression (IS) induced cellular injury in the rat. Neonatal sprague-dawley rats (n=224; weighing 5 to 7 g) were allotted randomly to four treatments (n = 56 per treatment) consisting of fully-thymectomized (Tx), partially-Tx, intact, and sham-operated rats. Thymectomy (TX) and sham-operation were performed within 16 hours of birth. Half (n=28) of the rats in each treatment group were sacrificed at 40 (pubertal) and the other half at 80 (mature) days of age, constituting 8 experimental groups. Neonatal thymectomy caused abnormalities in reproductive and mitochondrial indices as well as testicular morphometry (number and diameter of seminiferous tubules, spermatogenic index). Testicular volume, ventral prostate and spleen weight, several sperm attributes (concentration, motility, livability, membrane integrity (HOS), sperm penetration in to mucus, total antioxidant capacity, and mitochondrial dehydrogenase activity), and plasma superoxide dismutase, glutathione (GSH) and testosterone levels were decreased in Tx rats. Fertility, measured by recording the litter size of the mated females, was also reduced in Tx rats. However, adrenal gland weight, sperm malondialdehyde (MDA) level, indices of oxidative stress, sperm abnormality, testicular and sperm lipid peroxidation, protein carbonylation and sperm ROS generation were increased in Tx groups. In Tx rats, the testes contained high levels of MDA but low levels of GSH and ferric reducing antioxidant power. The data indicated that increased oxidative stress and mitochondrial dysfunction might play a role in the mechanism of IS-induced testicular and sperm abnormalities.

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