Effect of monensin, a Na\(^+\)-specific carboxylic ionophore on the oxidative defense system in rat testis

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Abstract:
The effect of monensin, a Na\(^+\)-specific ionophore on the oxidative defense system in rat testis was studied. Monensin mixed in the animal diet was administered at the dose levels of 2.5, 5 and 10 mg/kg b.w. to Wistar rats for a period of 67 days. A marked inhibition in the activities of different oxidative defense enzymes such as catalase, glutathione peroxidase, glutathione-S-transferase, superoxide dismutase and glutathione reductase was noticed, which indicates the possible involvement of free radicals in the antispermatogetic effects of monensin in rat testis. This was further substantiated by a significant increase in the generation of lipid peroxides along with the depletion of reduced glutathione. The drug treatment resulted in a significant change in apoptotic cell death as seen by an elevated fragmentation in the testicular genomic DNA. Monensin treatment also resulted in marked degenerative changes in the histoarchitecture of testes, such as depletion of different germ cell populations, vacuole formation and disorganization of seminiferous tubules. The results are indicative of the potential antispermatogetic effects of monensin in the rat.

Key words:
monensin, oxidative damage, DNA fragmentation, rat testis, antispermatogetic, histoarchitecture