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JOURNAL ARTICLE

Comparison of effects of 0.5 and 3.0 Gy X-irradiation on lipid peroxidation and antioxidant enzyme function in rat testis and liver

V. Peltola, M. Parvinen, I. Huhtaniemi, J. Kulmala and M. Ahotupa

Department of Physiology, University of Turku, Finland.

The prooxidant effect of X-irradiation on rat testis and liver tissue was studied with doses of 0.5 and 3.0 Gy; the latter dose kills the proliferating spermatogonia and causes a maturation-depletion process in the germ cells. The level of lipid peroxidation, measured by the formation of diene conjugates and thiobarbituric acid-reactive substances (TBARS) and the activities of the antioxidant enzymes were determined 0.5 hours, 1 day, 7 days, and 31 days after the exposure. In the liver, increased levels of diene conjugation (+36%, $P < 0.05$) in the group of 3.0 Gy at 0.5 hours indicated increased lipid peroxidation. At the same time, TBARS were increased (+25%, $P < 0.05$) in the group of 0.5 Gy, but not in the 3.0-Gy group. In the testis, diene conjugation was not determined at 0.5 hours postirradiation, and at day 1 it was at the control level. The level of TBARS in the testis was below control (-11%, $P < 0.01$) in the 3.0-Gy group at day 1. At day 31 after 3.0 Gy in the testis, an increase in the amount of conjugated dienes (+24%, $P < 0.01$) was observed in parallel with a decreased level of TBARS (-15%, $P < 0.01$). The activity of superoxide dismutase (SOD) was decreased in the testis at 0.5 hours postirradiation (-28%, $P < 0.05$, and -29%, $P < 0.05$, in the groups of 0.5 and 3.0 Gy), whereafter it returned to normal by day 7. In the liver, such inactivation of SOD was not observed. (ABSTRACT TRUNCATED AT 250 WORDS)

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