

Journal of Andrology, Vol 15, Issue 4 353-361, Copyright © 1994 by The American Society of Andrology

JOURNAL ARTICLE

Lipid peroxidation and antioxidant enzyme activities in the rat testis after cigarette smoke inhalation or administration of polychlorinated biphenyls or polychlorinated naphthalenes

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Lipid peroxidation products and antioxidant enzyme activities were studied in the rat testis following exposures to cigarette smoke, polychlorinated biphenyls (PCBs), or polychlorinated naphthalenes (PCNs). Three hours after a single 1-hour period of smoke inhalation, the levels of fluorescent chromolipids and thiobarbituric acid-reactive species (TBARS) were markedly increased in the testis (+49%, $P < 0.01$, and +43%, $P < 0.05$, respectively). Twelve hours after daily smoking for 1 hour, for 1, 5, or 10 days, such an increase was not found. Activities of the antioxidant enzymes superoxide dismutase (SOD), catalase, glutathione peroxidase (GSH-Px), glutathione transferase (GSH-Tr), or hexose monophosphate shunt (HMS) were not affected immediately, 3 hours, or 12 hours after a single smoking session. Twelve hours after smoking for 5 days, the activity of catalase was decreased (-16%, $P < 0.05$). Smoking exposures had no consistent effects on serum follicle-stimulating hormone (FSH), luteinizing hormone (LH), or testosterone concentrations. Single i.p. injections of PCB or PCN mixtures resulted in decreases in testicular SOD activity 1 day after the exposures (-14%, $P < 0.05$, and -51%, $P < 0.01$, respectively). Catalase activity also decreased after both exposures (-30 to -42%, $P < 0.05$, at days 1-7 after PCB exposure, and -37 to -43%, $P < 0.05$, at days 3-7 after PCN exposure). Ninety days after the PCN exposure, activities of GSH-Px and GSH-Tr were decreased in the testis (-20%, $P < 0.05$, and -26%, $P < 0.05$, respectively). (ABSTRACT TRUNCATED AT 250 WORDS)

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