Aroclor 1254 impairs spermatogenesis and induces oxidative stress in rat testicular mitochondria

Hamdy A.A. Aly a,b,*, Óscar Domènech b, Ashraf B. Abdel-Naim c

a Department of Pharmacology and Toxicology, Faculty of Pharmacy, Al-Azhar University, Nasr City, Cairo, Egypt
b Unit of Cellular and Molecular Pharmacology, Catholic University of Louvain, B-1200 Brussels, Belgium
c Faculty of Pharmacy, Department of Pharmacology and Toxicology, King Abdulaziz University, Jeddah, Saudi Arabia

ABSTRACT

Aroclor 1254 (A1254) has been shown to have potential testicular toxicity. The mechanism of action of A1254 on male reproduction is not clear. The present study was designed to investigate the potential toxicity of A1254 on rat spermatogenesis. Oxidative stress was also assessed in testicular mitochondria as an underlying mechanism. Adult male Wistar rats were injected with A1254 (0, 0.75, 1.5 or 3 mg/kg/day i.p.) or with vehicle (corn oil) for 20 consecutive days. A1254 at doses of 1.5 and 3 mg/kg/day resulted in a significant decrease in body weight, testes weight, epididymal and relative epididymal weight. Similarly, the relative testes weight was significantly decreased at 3 mg/kg/day. Sperm count, motility and daily sperm production were significantly decreased at 1.5 and 3 mg/kg/day. The same two doses significantly inhibited the activities of testicular mitochondrial CAT, GPx and GR while the activity of SOD was significantly decreased by 0.75, 1.5 and 3 mg/kg/day. The levels of H2O2 generation and LPO were significantly increased in mitochondria in a dose-related pattern. GSH and Vit C were significantly decreased at 0.75, 1.5 and 3 mg/kg/day. In conclusion, A1254 impairs spermatogenesis as evidenced, at least partly, by induction of oxidative stress in testicular mitochondria.

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