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## **Post-weanling Exposure to Polybrominated Diphenyl Ethers Results in Thyroid Hormone and Androgen Disruption**

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Polybrominated diphenyl ethers (PBDEs) have been widely used as flame retardants and are ubiquitous environmental contaminants. The major exposure source to human is intake of contaminated foods of animal origin. We examined thyroid hormone and steroid hormone concentration, sexual development and histopathological alterations in weanling rats exposed to commercial PBDEs, DE-71. Male Wistar rats, 28 days old, were exposed orally to 3, 30 and 100 mg/kg bw PBDEs for 14 days. We also investigated the recovery pattern at 7, 14 and 21 days after the stop of PBDEs administration. Relative organ weights of thyroid, liver were increased but seminal vesicle decreased without body weight change by PBDEs 30 or 100 mg/kg at 14 days of exposure. Liver weight was remained in increase but ventral prostate was significantly decremented by PBDEs 100 mg/kg at 21 days after withdrawal. Preputial separation was delayed dose-dependently and the size of sperm head was diminished at PBDEs 100 mg/kg. Thyroxine (T4), free T4 (FT4), triiodothyronine (T3), thyroxine-binding globulin (TBG) and testosterone content in serum were lower than those of control at 14 days exposure but FT3 and TBG were higher at 7 days treatment. The decrease of T4, FT4 and T3 was continued until 14 days or 21 days after withdrawal. Cholesterol, HDL-cholesterol and ALT were increased at 14 days exposure and recovered at 21 days withdrawal. However, LDL-cholesterol was not altered by PBDEs. Thyroid follicular epithelium showed hypertrophy with vacuolation and exfoliated into colloid area and colloid lumen was diminished and sparse. Liver parenchyma cells around portal vein showed vacuolation by 100 mg/kg PBDEs at 14 days exposure. The histopathological lesions were disappeared at 21 days after withdrawal. The present study suggests that PBDEs interferes sexual development and cholesterol metabolism with thyroid hormone and androgen system disruption when exposed young age and the recovery of hormonal system takes about 2-3 weeks after withdrawal.

**Keyword:** PBDEs, Thyroid hormone, Testosterone, Cholesterol, Sexual development