

Effect of 2-Bromopropane on the Spermatogenesis and Germ Cell Cycle in Sprague-Dawley Male Rats.

Yong Hyun Chung, Il Je Yu, Hyeon Yong Kim, Seung Hee Maeng, Cheol hong Lim, Jun Yeon Lee, Jeong Hee Han, Kwang Jin Kim, Jae Hwang Jeong, Yong Mook Lee, Young Hahn Moon.

Industrial Chemicals Research Center, Industrial Health Research Institute, Korea Industrial Safety Corporation
104-8 Moonji-Dong, Yusung-Ku, Taejon 305-380, Korea

ABSTRACT

To clarify the effect of spermatogenesis and germ cell cycle of rat 2-bromopropane (2-BP) has been investigated. 2-BP was tested through 28 days of repeated dose experiments in male Sprague-Dawley rats. Ten rats were allocated to each treatment group. Vehicle control olive oil, 125 mg, 250 mg, and 500 mg/kg body weight of 2-BP were injected into intraperitoneum daily for 28 days. Sertoli cells indices (SCI) per tubule of rats had a tendency to decrease depending on the dose of 2-BP, showing 30.4 for the control group, and 12.2 for the 500 mg/kg group. Testes treated with 125 mg/kg of 2-BP showed some decreases of cellular associations in seminiferous epithelium at all stages of spermatogenesis. Testes treated with 250 mg/kg of 2-BP showed a tubular degeneration with depletion of spermatogonia, spermatocytes, and spermatids. Vacuoles were present in the germinal epithelium. The testes of treated with 2-BP 500 mg/kg showed a significant decrease of seminiferous tubules size and an apparent increase in interstitial Leydig cells. Multinucleated giant cells derived from spermatids were observed in the seminiferous tubules. Even if

2-BP administration was stopped and the rat were allowed to recover from the testicular toxicity, the high dose treated rats did not show any significant recovery after 62 days. Rats treated with 250 mg/kg and 500 mg/kg of 2-BP resulted in the cellular damages characterized by a decreased number of spermatogonia, spermatocytes and spermatids at all stages. No immunopositive staining of PCNA (proliferating cell nuclear antigen) and cyclin D3 was observed in rats seminiferous tubules treated with 500 mg/kg of 2-BP. In conclusion, 2-BP affected the spermatogenesis and germ cell cycle of male Sprague-Dawley rats.