

Interaction of exposure concentration and duration in determining the apoptosis of testis in rats after cigarette smoke inhalation

Abstract

The effects of differences in smoke concentration and exposure duration in Sprague Dawley rats to determine variation in type and severity of the testis apoptosis were evaluated. The daily dosages were 10, 20 and 30 non-filter cigarettes for a period of 2, 4, 6, 8 and 12 weeks. Mainstream smoke exposure suppressed body weight gain in all regimens. A dose-related increase in plasma nicotine concentration was observed in smoke-exposed groups for 4, 6, 8 and 12 week regimens. Histopathological examination of the exposed groups showed disturbances in the stages of spermatogenesis, tubules atrophying and these appeared to be dose-related. Cytoplasmic caspase-3 immunostaining was detected both in Sertoli cells and germ cells in smoke-exposure groups. An increase in TUNEL-positive cells of testicular cells was observed after 6 weeks of cigarette exposure. The results indicate that cigarette exposure concentration and duration have interaction effect to induce apoptosis in the rat testes.