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Effects of methanol vapors on testosterone production and testis morphology in rats.

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Abstract

Potential toxic effects of methanol vapors on testicular production of testosterone and the morphology of testes were investigated using normal or methanol-sensitive folate-reduced rats. Methanol inhalation at the level of the current permissible exposure limit, 200 ppm, for up to six weeks (8 hours/day, 5 days/week), did not reduce serum testosterone levels in normal rats. Testes isolated from methanol-exposed (200 ppm) rats had the same capability as those from air-exposed rats in synthesizing testosterone whether testes were incubated in the absence or presence of hCG. The testes-to-body weight ratio of rats exposed up to 800 ppm methanol for up to 13 weeks (20 hours/day, 7 days/week) were not different from those of the air-exposed rats. Furthermore, methanol had no adverse effect on testicular morphology at the end of the 13 week exposure period at 800 ppm in either normal rats or folate-reduced methanol-sensitive rats when they were 10 months old at the time of examination. Thus, these data indicate that low level methanol may not cause an inhibitory effect on testosterone synthesis contrary to previous literature reports. However, a greater incidence of testicular degeneration was noticed in the 18 month old folate-reduced rats exposed to 800 ppm for 13 weeks (20 hours/day, 7 days/week), suggesting that methanol may have a potential to accelerate the age-related degeneration of the testes.