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JOURNAL ARTICLE

The effects of ethylene glycol monomethyl ether on testicular histology in F344 rats

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Ethylene glycol monomethyl ether (EGME) has been found to produce testicular atrophy in experimental rodents. The studies that follow were designed to determine the testicular cell type(s) most susceptible to EGME administration. For histologic studies, F344 rats were gavaged with 150 mg/kg/day of EGME 5 days per week, and serially sacrificed. In sections from perfusion-fixed tissue, necrotic changes were observed in some meiotic and premeiotic spermatocytes 24 hours after a single dose. Also, nuclear condensation was seen in occasional early pachytene spermatocytes. These effects were magnified after two doses; there were more necrotic pachytene and meiotic spermatocytes than necrotic stage I pachytene spermatocytes. By day 4, testes from all treated animals were affected; there was a pronounced maturation-depletion effect, seen as the absence of round spermatids from tubules in stages I to III. These effects continued to develop at days 7 and 10, leaving only Sertoli cells, spermatogonia, and late stage spermatids populating the epithelium. Other animals were treated similarly, but subject to efferent duct ligation 16 hours prior to sacrifice. Fluid production, as judged by weight gain in the testes after efferent duct ligation, was unaffected by EGME treatment. Analysis of the fluid collected at the rete testis indicated that there was no treatment-related change in the relative amounts of androgen binding protein. The data indicate that the spermatocyte is the primary target cell for the histologic effects of EGME in the testis of F344 rats.