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Status of Spermatogenesis and Sperm Parameters in Langur Monkeys Following Long-term Vas Occlusion With Styrene Maleic Anhydride

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Vas occlusion by styrene maleic anhydride (SMA), trade name RISUG (one of the promising male contraceptive procedures currently in phase III clinical trials), at 60 mg/vas deferens dissolved in 120 μ L dimethyl sulphoxide (DMSO) at up to a 540-day study period caused severe oligospermia in the first 2 to 3 ejaculations and uniform azoospermia in the subsequent ejaculations without toxicity in langur monkeys. The ejaculated spermatozoa were necroasthenoteratozoospermic, suggesting instant sterility. Routine hematology and clinical chemistry parameters and the serum testosterone and sperm antibody titers remained unchanged from their pretreatment values until 540 days vas occlusion. Histology of testes revealed continued spermatogenesis throughout the study period. The stages of spermatogenesis appeared normal until 300 days of vas occlusion. At 360 days of vas occlusion, germ cells appeared in the lumen. Degeneration of seminiferous epithelium was evident in some of the tubules. Following 420 days of vas occlusion, the central portion of the testis showed regressed seminiferous tubules depicting various shapes and devoid of germ cells, which continued until 540 days of vas occlusion. Ultrastructure of the testes after 540 days of vas occlusion revealed vacuolization in the cytoplasm of Sertoli cells and degenerative features in the membranes of the spermatocytes and spermatids in the affected seminiferous tubules. The sub-cellular features of the normal tubules were similar to those of controls. The results suggest focal degeneration of seminiferous epithelium in the central portion of the testis following long-term vas occlusion with SMA.

Key words: Male contraception, RISUG, testis, azoospermia

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