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Alterations of testicular function induced by hyperprolactinemia in the rat

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The effects of hyperprolactinemia on testicular structure and pituitary-gonadal function were investigated in male rats. Hyperprolactinemia was induced in the Wistar-Furth rat by implantation of tissue fragments of a prolactin-secreting MtTW15 pituitary adenoma. The MtTW15 tissue was maintained in one animal group for 27 days (group A) and in another group for 37 days (group B). Appropriate age-matched controls were utilized in each study. Serum prolactin was significantly elevated (P less than 0.001) in both groups of MtTW15-bearing rats compared with their controls. The degree of hyperprolactinemia was more severe in rats of group B (2842 +/- 546 ng/ml) than in rats of group A (367 +/- 38 ng/ml). Accessory sex organ weights in group B rats were significantly lower than in controls, but were apparently unaffected in group A rats. Hyperprolactinemia induced definite but variable testicular alterations in both animal groups that presented as seminiferous epithelial disorganization, germ cell exfoliation, increased tubule wall thickness, and abnormal Leydig cell lipid content. Electron microscopy revealed structural disruption of Sertoli-germ cell junctional complexes and apical Sertoli cell cytoplasmic degeneration. The hyperprolactinemic rat exhibited significant reductions in serum luteinizing hormone (LH), testosterone (T), and androgen binding protein (ABP) when compared with controls. Eighty-six days following surgical removal of the MtTW15 tissue in a subgroup of group B rats, serum levels of prolactin and LH returned to normal, as did weights of accessory sex organs and testicular morphology. These results indicate that exposure to the MtTW15 adenoma and its later removal in the rat provides a workable model for studying the effects of hyperprolactinemia on testicular structure and function, and for identifying events involved in the subsequent recovery of spermatogenic disruption.

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