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JOURNAL ARTICLE

Is Leydig cell steroidogenic function affected by the germ cell content of the seminiferous tubules?

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The effect of testicular germ cell content on Leydig cell steroidogenic function in vivo in adult rats was examined. Three experimental paradigms were used to effect germ cell changes. First, a vitamin A-depletion/repletion regimen was used to achieve synchrony at different stages of the cycle of the seminiferous epithelium and thus produce testes with widely differing germ cell contents. Second, long term vitamin A depletion was used to effect germ cell, but not Leydig cell, loss. Third, Leydig cells and germ cells first were eliminated from the testes of adult rats by the administration of ethane 1,2-dimethane sulfonate (EDS) along with testosterone- and estradiol-filled Silastic capsules; Leydig cells were then restored to the germ cell-depleted testes by removal of the luteinizing hormone (LH)-suppressing capsules. Serum, interstitial fluid, and seminiferous tubule fluid testosterone concentrations did not differ between rats in which at least 70% of the seminiferous tubules contained germ cells at stages VII-VIII or at stages XII-III of the cycle. The capacity of the testes of these rats to produce testosterone, assessed by their in vitro perfusion with maximally stimulating LH, also showed no differences despite the differences in germ cell content. Elimination of germ cells throughout the testes by long term vitamin A depletion also did not affect the steroidogenic function of the testes. Finally, the steroidogenic function of Leydig cells restored to germ cell-depleted testes was indistinguishable from that of germ cell-containing controls. These results, taken together, provide evidence supporting the contention that the germ cell content of the testis has little or no effect on testicular steroidogenic function.

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