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JOURNAL ARTICLE

Alteration of mRNA transcript levels of rat testicular cells following procarbazine administration

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The present study examined the effects of a single 400-mg/kg dose of procarbazine upon various testicular mRNA transcript levels in adult Sprague-Dawley rats. Northern blot hybridization was employed to measure the steady-state mRNA levels of proteins specific for Sertoli cells (adrogen-binding protein [ABP] and transferrin) and spermatids (protamine 1 and transitional protein 2). In addition, mRNA transcript levels were determined for germ cell-specific hemiferrin and insulin-like growth factor-1 (IGF-1), which in adult rats is present predominantly in primary spermatocytes. Furthermore, the chronology of the effects of procarbazine upon spermatogonial populations was examined in whole mounts of seminiferous tubules. The effect of procarbazine upon spermatogenesis was first noted among mature A3, young A4, and B spermatogonia 48-72 hours after drug administration. These results indicate that A2 through intermediate spermatogonia were most susceptible to procarbazine. In addition, degeneration of spermatocytes and young spermatids was evident by 5 days. Northern blot analysis of testicular poly (A)+ RNA revealed that the steady-state levels of mRNA transcripts of the spermatid nuclear proteins (protamine 1, 700 bp; and transitional protein 2, 580 bp) remained relatively unchanged for 5 days after procarbazine administration but were significantly decreased by more than 70% by 7 days. On the other hand, the steady-state mRNA levels for the Sertoli cell proteins ABP (1.7 kb) and transferrin (2.7 kb) were decreased by 45% and 50% ($P < 0.05$), respectively, 2 days after procarbazine administration. Significant suppression of ABP mRNA levels persisted through day 5, with partial recovery noted on day 7.(ABSTRACT TRUNCATED AT 250 WORDS)