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RL 1780-9
May 2, 1966

TIMING OF HUMAN SPERMATOGENESIS BY RADIATION DEPLETION**

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The testes of normal male volunteers were exposed to single doses of ionizing radiation from 100r to 300r. This dosage range was sufficient to cause degeneration of spermatogonia present at the time of radiation. At this dosage spermatocytes and spermatids do not undergo degeneration and thus are permitted to proceed with maturation; reduction division, and sperm formation in a normal manner. These biopsies were compared directly with the H^3 -Thymidine biopsies of Heller and Clermont (1964). In the thymidine experiment the most advanced labeled cell was followed. In the radiation experiment the least advanced remaining cell was followed. The least advanced cell to complete the process of spermatogenesis by forming spermatozoa was the pre-leptotene spermatocyte following radiation. The most advanced labeled cell following injection of thymidine was also the pre-leptotene spermatocyte. In each instance the time required for a pre-leptotene spermatocyte to become a mature spermatozoa was determined to be 46 days. These data reveal that after exposure to radiation the germinal epithelium denudes at the same rate as the normal germinal cells mature.

* Applying for membership to PCFS.

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1780-10

URINARY TESTOSTERONE EXCRETION AS AN INDEX OF TESTICULAR SECRETION*

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Urinary testosterone has been quantitated by a gas-chromatographic method to determine if excretion of testosterone in the urine reflects testicular secretion of this hormone. The mean urinary testosterone excretion for 47 normal adult males (ages 24-56) was 89 $\mu\text{g}/24$ hrs. (range 30-176); for three normal females was 6 $\mu\text{g}/24$ hrs. (3-8); and, for a castrate male was less than 17 $\mu\text{g}/24$ hrs. Testicular Leydig-cell stimulation was induced with human chorionic gonadotropin and clomiphene citrate. Administration of HCG to five normal males increased the mean urinary testosterone from 82 $\mu\text{g}/24$ hrs. to 247 $\mu\text{g}/24$ hrs. Clomiphene citrate administration increased the mean testosterone excretion from 67 $\mu\text{g}/24$ hrs. to 194 $\mu\text{g}/24$ hrs in three normal males. Identical treatment of the castrate subject with HCG and Clomiphene citrate produced no increase in urinary testosterone excretion. Mean urinary testosterone levels were depressed from 98 $\mu\text{g}/24$ hrs. to 35 $\mu\text{g}/24$ hrs. by administration of a progestational agent (SC-9022) to two male subjects. These results suggest that the excretion of testosterone in the urine may be used as a convenient and reliable index of testicular production of this hormone.

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