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TESTIS MASS LOSS IN THE MOUSE INDUCED BY TRITIATED THYMIDINE, TRITIATED WATER, AND ^{60}Co GAMMA IRRADIATION

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Abstract -- The reduction of testis mass of the mouse following single injections of tritiated thymidine (1.0-20 μCi tritium/g body mass) or tritiated water (10-40 μCi tritium/g body mass) and ^{60}Co gamma rays (delivered to match the dose-rate vs. time curve in the 40 μCi tritium/g body mass tritiated water group) was investigated at times from 1 hr to 24 weeks after injection. Measurements of the testicular retention of tritium were also made at these times.

There was a progressive loss in mass, up to 30% after 4-5 weeks, followed by an irregular recovery which was more delayed in the case of the tritiated-thymidine-injected animals.

The effectiveness of tritium compared with ^{60}Co gamma rays, calculated using the average absorbed dose to the testis, was 1.43 for tritiated water and 2.07 for tritiated thymidine. A significant effect on the testis mass was seen after the injection of tritiated thymidine at 1.0 μCi tritium/g body mass, which delivered an average absorbed dose to the testis of about 3.5 rad (0.035 Gy) during 16 weeks. Calculations suggest that tritium from tritiated thymidine "fixed" in the testis was about twice as effective as the more labile and uniformly distributed tritium from tritiated water and that in terms of injected amount tritiated thymidine is unlikely to be more than five times as effective as tritiated water even at very low injected amounts.