employed on the male accessory gland, described above, have permitted detection of a labile enzyme localized differently from the more stable acid and alkaline phosphatases.

The specificity of the enzyme dealt with here remains an open question. The tissues of the male accessory glands are capable of hydrolyzing both glucose-6-phosphate and fructose-6-phosphate. Whether this fact implies the presence of separate enzymes for the 2 substrates, or of an enzyme which will nonspecifically split either hexose ester, is not known. In any event, it is of interest that high concentrations of fructose occur in seminal fluid and that an enzyme capable of splitting fructose phosphate occurs in the glands where the fructose originates.

Summary. The seminal vesicles and prostate gland of the rat are capable of hydrolyzing both fructose-6-phosphate and glucose-6-phosphate. This hydrolytic activity is located in different regions from those containing acid and alkaline phosphatase. The activity toward the hexose phosphates is easily destroyed by fixing agents. The significance of the hexose phosphatase activity is briefly discussed in relation to the fructose metabolism of the male reproductive system.

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Effect of Atabrine on X-Irradiation-Induced Leucopenia in Chick, Rat and Mouse.* (20918)

BARBARA KELLEY, MARY ROSE SIMMONS, PAUL L. DAY, I. MESCHAN, AND CARL D. DOUGLASS.

From the Departments of Biochemistry and Radiology, School of Medicine, University of Arkansas, Little Rock.

It has been previously noted that the administration of atabrine at relatively high levels causes a marked generalized leucocytosis in rats and chicks(1,2). Since x-irradiation is known to produce a marked leucopenia in experimental animals it seemed of interest to determine the effect of atabrine on leucocyte level following irradiation. In connection with this study it has been observed that the failure of chicks to feather normally after exposure to x-irradiation is overcome by the administration of atabrine(3).

Methods. The x-irradiation treatments reported here were carried out using the following factors: 15 ma, 220 KV, inherent filtration only, HVL 0.25 mm Cu, 32 inches to the center of the animal, rate of 35.5 r/min. (in air), field size covering the entire animal. Day-old White Rock chicks were placed on the purified diet described by Keith *et al.*(4) supplemented with 2 mg of folic acid per kilo of diet. One half of the chicks received a supplement of 500 mg of atabrine per kilo of diet. After 10 days on these diets the birds were subjected to 725 r. In experiments to determine the effects of atabrine given after irradiation, all the chicks were fed the unsupplemented diet for 13 days prior to irradiation (675 r). Immediately after irradiation the birds were divided into 2 groups. The birds of one group were injected intraperitoneally with a 5% solution of glucose and

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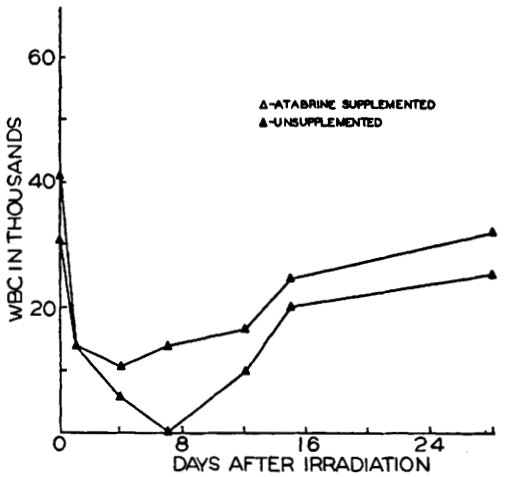

FIG. 1. Effect of atabrine on post-irradiation leucopenia in the chick. Each point represents avg of 5 items except last 2 points in lower curve which represent, respectively, 4 and 3 items.

those of the group to receive atabrine were treated with one cc of glucose solution containing 0.5% atabrine. Subsequently the latter group received atabrine in the diet as described above. Weanling female Sprague-Dawley rats were fed the purified diet of Kelley *et al.*(5) with one-half of the animals receiving a supplement of 500 mg of atabrine per kilo of diet. The animals were subjected to 330 r of x-irradiation after remaining on the diets for 23 days. Swiss mice were fed Purina laboratory chow which had been ground and formed into pellets using either water or an atabrine solution to form a paste. The atabrine was added at a level of 500 mg per kilo of diet. The animals were subjected to 675 r of x-irradiation after remaining on the diets for a week. Thirty-six days after the initial irradiation the surviving animals were subjected to 750 r. Blood was drawn from the wing vein of the chicks. Standard hematological procedures were used in making the white cell counts in the case of rats and mice. The method of Wiseman was used with the chicks(6).

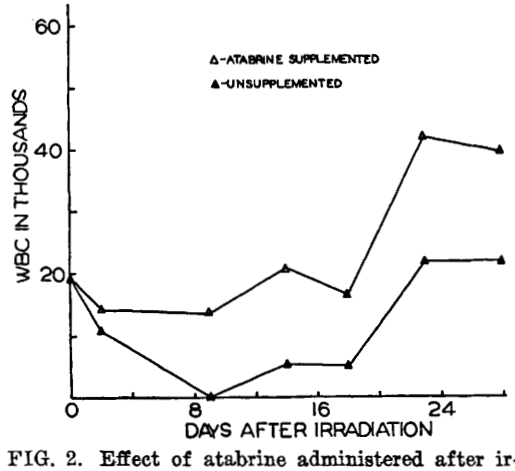

FIG. 2. Effect of atabrine administered after irradiation on post-irradiation leucopenia in the chick. Each point represents avg of 5 items.

Results. The leucocyte counts for the chicks which received atabrine before irradiation are shown graphically in Fig. 1. The birds had been on the experimental diets for 10 days prior to irradiation and were observed for 30 days after irradiation. Over the experimental period there was no difference in weight gain between the 2 groups. Fifteen unsupplemented birds showed a post-irradiation mortality of 80%, whereas in 18 atabrine-supplemented birds there was a 66% mortality.

TABLE I. Effect of Atabrine and Post-Irradiation Leucopenia in Rats.

Diet	Avg WBC/mm³ immed. prior to irradiation (×1000)	Avg WBC/mm³ on 6th day post-irradiation (×1000)	Days to return to 15000 WBC/mm³
Basal	20.29	4.40	20
Basal + atabrine (500 mg/k diet)	29.21	4.52	17

That the same effect on the leucocyte level is obtained when atabrine administration is started after irradiation is shown in Fig. 2. The mortality was 50% in both groups. No white cells were visible either in the hemocytometer or in smears at about the eighth day post-irradiation in the chicks receiving no atabrine in both the above experiments while those receiving atabrine maintained white counts of between 15,000 and 20,000 per mm³. Atabrine did not affect preferentially the numbers of the various cell types.

Rats which were subjected to sublethal doses of x-irradiation exhibited the typical post-irradiation leucopenia (Table I). No deaths occurred in either group.

TABLE II. Effect of Atabrine on Post-Irradiation Leucopenia in Mice.

Diet	Avg WBC/mm³ immed. prior to irradiation (×1000)	Avg WBC/mm³ on 4th day post-irradiation (×1000)	Days to return to 15000 WBC/mm³	Avg WBC/mm³ on 7th day after 2nd irradiation (×1000)
Basal	15.45	5.36	16	1.69
Basal + atabrine (500 mg/k diet)	16.30	8.43	10	5.05

Mice which were subjected to 675 r of x-irradiation developed a severe leucopenia. After the second irradiation (750 r) a more severe leucopenia developed (Table II). In separate experiments it was determined that there was no difference in the survival rates between the 2 groups as judged by the total number of animals dying or the times of death.

Discussion. In the case of the chick, atabrine did not completely prevent the post-irradiation leucopenia but it prevented the dramatic fall in leucocyte count which was observed in the untreated group. It will be seen from Fig. 1 that the atabrine-supplemented birds lost more cells on a percentage basis in the period immediately following irradiation than did the birds of the unsupplemented group. However, the groups receiving atabrine either before or after irradiation, had entered the recovery phase when the unsupplemented groups were exhibiting leucopenia so severe that no white cells were demonstrable in the blood. In view of the previous report(3) from this laboratory, it seems that atabrine exerts a beneficial effect in this species, however exhaustive studies on any alterations in the mortality rates are necessary to establish this definitely. It is significant that the effect of this drug on white cell levels may be observed when it is administered after irradiation.

The application of the "Student" t test(7) to the data obtained from the mouse and rat experiments indicate that the differences observed in the white blood cell counts are of doubtful significance.

Summary. 1. Supplementation of the diets of chicks with atabrine tends to reduce markedly the severity of post-irradiation leucopenia. 2. Atabrine administration to rats and mice may alter the post-irradiation leucopenia slightly.

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