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RADIORESPONSE OF RESTING PRIMARY SPERMATOCYTES IN THE PRESENCE OF S-2(3-AMINOPROPYLAMINO) ETHYL PHOSPHOROTHIOIC ACID

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RESTING primary spermatocytes are highly prone to the radiation-induced damage and constitute one of the most radiosensitive components of the testis[1]. S-2-(3-aminopropylamino) ethylphosphorothioic acid, also known as WR-2721, is a thiophosphate radio-protector having bright prospects for clinical use. The present investigation is an attempt to study the protective effect of WR-2721 on the response of resting primary spermatocytes (R) of the mouse testis after exposure to moderate doses of gamma radiation.

Adult male Swiss albino mice were irradiated with 3, 6 and 8 Gy of ^{60}Co gamma rays in three groups with and without intraperitoneal injection of WR-2721 (400 mg/g b.w.), 15–30 min before irradiation. Testes were removed from the animals, autopsied at 1/4, 1, 2, 4, 7, 10, 14 and 28 days after irradiation, and fixed in the Bouin's fluid. Paraffin sections were cut at 5 μ thickness and stained with PAS-haematoxylin stain. Resting primary spermatocytes were counted from the tubules at stage VIII and the counts were corrected by the Aberchrombie's formula[2]. Identification and selection of the tubular cross sections for counting were based on the classification of Oakberg[3] and the duration of the various stages of the cycle was described by Oakberg[4] and Clermont and Trott[5].

The observations revealed that R spermatocytes were highly radio-sensitive as indicated by the large scale immediate cell death. This is also reported elsewhere[6–8]. It has been noticed that the number of R spermatocytes is directly affected by the damage to the spermatogonial population as they are formed by the differentiation of spermatogonia B.

After radiation exposure, the number of R spermatocytes decreased with time and with the increase in the dose of radiation upto day 1, reaching negligible quantities at day 2. Their number remained either zero or nearly zero upto day 7. At day 10, while it started to increase in a dose-dependent manner after exposure to 3 and 6 Gy, it continued to remain around zero upto day 14 in the 8 Gy treated group. At day 28 the quantity of R spermatocytes recovered to a significant extent. The experimental values were always found higher than their respective controls. The maximum number of R spermatocytes was observed in the testes treated with 3 Gy, lower in 6 Gy and lowest in the 8 Gy groups at all the intervals.

Table 1 *Variations in the percentage of resting primary spermatocytes per tubule C.S. in the testes of mouse after irradiation with (E) and without (C) WR-2721 pretreatment (mean ± S.E.)*

Treatment		Post irradiation time							
		1/4 day	1 day	2 day	4 day	7 day	10 day	14 day	28 day
3 Gy	C	92.13 ± 1.29	54.60 ± 1.40	2.40 ± 0.53	0	0	6.66 ± 0.51	29.44 ± 1.32	86.90 ± 1.75
	E	98.34 ± 1.63 *p* 0–01	65.11 ± 1.86 *p* 0.001	6.10 ± 0.42 *p* 0.001	0	0	13.07 ± 1.38 *p* 0.001	40.59 ± 1.77 *p* 0.001	97.55 ± 1.69 *p* 0.001
6 Gy	C	73.42 ± 2.17	50.13 ± 1.46	0.80 ± 0.20	0	0	3.02 ± 0.43	15.64 ± 0.90	74.53 ± 2.15
	E	81.96 ± 2.64 *p* 0.02	57.19 ± 1.85 *p* 0.01	4.27 ± 0.13 *p* 0.001	0	0	10.15 ± 0.80 *p* 0.001	25.48 ± 1.22 *p* 0.001	88.25 ± 2.99 *p* .001
8 Gy	C	63.72 ± 2.11	40.11 ± 1.38	0	0	0	0	0	60.79 ± 1.72
	E	70.16 ± 2.50 *p* 0.05	54.13 ± 1.45 *p* 0.001	0	0	0	0	0	72.18 ± 1.64 *p* < 0.01

1. Number of resting primary spermatocytes in the testes of normal, sham-irradiated mouse = 18.22 ± 0.67 per tubule C.S.
2. Figures represented in the table are based on arithmetic mean of 50 readings.
3. All probabilities (*p*) refer to *p* < . . . the value indicated.

The decrease in the number of R spermatocytes at early intervals might be caused by the radiation-induced lethal damage to these cells. After 24 hr and later, this reduction does not seem to be only due to the direct cell killing and diminished proliferative activity of the precursors leading to maturation depletion, but also due to mitotic death in the dividing maturation pool. The sudden spurt in their number at day 28 might be due to the reappearance of a considerable number of their precursors at the previous interval. Significantly higher quantities of R-spermatocytes observed in the drug-treated groups at all the dose levels, indicate a high degree of protection given by WR-2721 to the testicular elements under observation. It is reported that WR-2721 enters into the tissue by passive diffusion and dephosphorylates enzymatically[9]. After that it gets distributed intracellularly and thus protects the biological materials against the radiation induced cell death, by a number of molecular and physiological mechanisms[9,10].

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SCIENCE NEWS

FIRST RECORD OF *SEPTORIA VERONICAE* ON VERONICA

A severe leaf spot disease on Veronica, an ornamental hardy herbacious perennial, was observed during the summer at Nehru Memorial Botanical Garden, Cheshmashahi, Srinagar.

The disease on the leaves is characterised by numerous pale spots with small black dots arranged in circles, measure about 1.5 mm in dia and have greyish ashy centres. Later these dots coalesce to form large necrotic patches.

The pathogen responsible for the disease has been identified as *Septoria veronicae* Rob. and Desm.—a pathogenic parasite on the plant. Pycnidia, partly embedded in plants, are dark separate, globose, ostiolate, 100–170 μ in dia; erumpent and produced in spots. Conidiophores are short. Conidia (Pycnidiophores) are narrowly elongated to filiform, hyaline, 3–4 septate and measure 28–40 × 1.5 μ.

The species *Septoria veronicae* is a new record for India. The pathogen was isolated on PDA and Czapek's agar medium from diseased leaves. The fungus grew with profuse sporulation and a number of pycnidia bearing clusters of conidia were observed.

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