

EFFECT OF CNS STIMULANTS AND ADRENAL HORMONES ON OUTCOME OF ACUTE IRRADIATION OF MICE IN AN SHF FIELD

V. M. Koldaev

UDC 616.12-001.21-02:538.3] -085.214.31-059:615.357.453

The survival rate of albino mice irradiated in an shf field with an intensity of 62 ± 5 mW/cm² ($\lambda = 12.5$ cm) for 16 min was doubled by administration of hydrocortisone and increased by almost 1.5 times by noradrenalin and strychnine.

The effect of CNS stimulants and adrenal hormones on the survival of animals irradiated in an shf electromagnetic field was studied.

EXPERIMENTAL METHOD

Experiments were carried out on 175 male albino mice weighing 24-30 g exposed to a single dose of whole-body shf-irradiation by the contact method [1] from a type LUCH-58 apparatus ($\lambda = 12.5$ cm) in an intensity of 62 ± 5 mW/cm² for 16 min. Of the total number of irradiated animals, 10-15% died during exposure after the 12th minute of irradiation. Mice surviving irradiation for 16 min formed the experimental group.

The drugs (Table 1) were injected in a single dose immediately after irradiation as solutions in isotonic NaCl. Mice receiving isotonic NaCl only, in a dose of 10 ml/kg, acted as the control. The effective-

TABLE 1. Survival Rate of Mice Irradiated in an shf Field after Treatment by Various Drugs

Drug given	Method of injection	Dose (mg/kg)	No. of mice irradiated	No. of mice surviving for 3 weeks	Survival rate
Control	Subcutan.	—	15	6	0.4
Leptazol	Subcutan.	10	10	4	0.4*
		20	10	5	0.5
		50	10	2	0.2
Strychnine nitrate	Subcutan.	0.2	10	3	0.3*
		0.5	10	6	0.6
		1.0	10	7	0.7
		2.0	10	1	0.1
Control	Intraperit.	—	15	7	0.46
Noradrenalin bitartrate	Ditto	0.25	10	5	0.5*
		0.50	10	6	0.6
		1.0	10	5	0.5*
		2.0	10	4	0.4
Hydrocortisone	Ditto	0.5	10	5	0.5*
		1.0	10	8	0.8
		2.0	10	6	0.6

*Difference from control not significant ($P > 0.05$).

Department of Biophysics, Vladivostok Medical Institute. (Presented by Academician of the Academy of Medical Sciences of the USSR V. V. Zakusov.) Translated from *Byulleten' Éksperimental'noi Biologii i Meditsiny*, Vol. 76, No. 9, pp. 27-28, September, 1973. Original article submitted December 29, 1971.

© 1974 Consultants Bureau, a division of Plenum Publishing Corporation, 227 West 17th Street, New York, N. Y. 10011. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, microfilming, recording or otherwise, without written permission of the publisher. A copy of this article is available from the publisher for \$15.00.

ness of the drugs was assessed from the survival rate, calculated as the ratio between the number of mice surviving for 3 weeks after irradiation and the total number of mice irradiated.

EXPERIMENTAL RESULTS

The experimental results are given in Table 1. Of the drugs used, hydrocortisone was the most effective in acute shf injury, for its administration in a dose of 1 mg/kg increased the survival rate to almost twice the control level. Noradrenalin and strychnine increase the survival rate by a lesser degree and leptazol was relatively ineffective.

The results indicate that treatment with adrenal hormones and CNS stimulants in the early period of shf irradiation may have a favorable effect on the course of the recovery period.

LITERATURE CITED

1. A. S. Presman, Novosti Med. Tekhniki, No. 4, 51 (1960).