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EFFECT OF SULFUR-35 ON THE SURVIVAL OF YOUNG OOCYTES IN MOUSE

EXTENSIVE work has been done on the effect of various physical agents on oocytes¹⁻³. The work has been extended to radioisotopes by Bloom³. He has reported severe damage to the ovary of mouse and rat after treatment with a number of internal emitters such as radium and plutonium. The response of young oocytes to phosphorus-32⁴ and iodine-131⁵ showed that even low doses were highly effective in causing damage to young oocytes. In the present investigation an attempt is made to study the effect of ³⁵S, a medically important radionuclide on young oocytes in mice treated as embryos.

CBA pregnant mice were injected (ip) with a dose of 20 μ Ci of ³⁵S (supplied by BARC, Bombay) in the form of Carrier-free Na₂ ³⁵SO₄ in 0.5 ml of saline on 15.5 days of gestation. Another batch of pregnant mice injected with normal physiological saline were kept as controls. All the pregnant animals allowed to litter and the F₁ progeny were killed at maturity and ovaries were collected. Oocytes of Stage I and stage II were scored in every eleventh serial section of the ovary. The sums per female obtained were converted to experimental: control ratios as outlined by Oakberg and Clark⁶.

The results on the response of stage I and II oocytes to ³⁵S are shown in Table I.

TABLE I

Numbers of stage I and II oocytes in mice treated with saline (control) and ³⁵S on 15.5 days of gestation

Treatment and Dose	Stage I	Stage II	Total oocytes (stage I and II pooled)
Control	284	308	592
³⁵ S	204 (0.7183)	228 (0.7403)	432 (0.7297)

($p < 0.05$)

Experimental/control ratios are given in parentheses

A severe depletion in the numbers of the above mentioned types of oocytes was evident in the treated group. The survival fraction of oocytes of stage I and II are 71.8% and 74.0% respectively. This decrease was found to be statistically significant ($p < 0.05$). The relative sensitivities of stage I and II

oocytes indicate an apparent variation but test for heterogeneity for differences in sensitivity shows no significant variation between the cell types ($p > 0.05$).

Histological observations in mice by several investigators^{2,7} showed that the effect of irradiation was much greater if the mice were irradiated at birth rather than as adults. A reduction in the oocyte numbers in adult mice were also reported with physical agents^{2,7} radioisotopes^{3,4,8} and chemicals⁹. The decrease in oocyte number in the treated females in the present study indicates the oocytes killing effect of ³⁵S which is accumulated in the ovaries of the embryos. A number of uptake studies have shown the incorporation of ³⁵S in the ovary of mammals¹⁰.

The present investigation indicates that the treatment of females with ³⁵S during pregnancy will result in the incorporation of ³⁵S into ovaries of the embryos and this might result in the severe disturbance of fertility in females and may lead to abortions or miscarriages.

Department of Zoology, K. SATYANARAYANA REDDY,
A.V. College,
Gaganmahal,
Hyderabad 500 029,
and

Institute of Genetics and P. P. REDDY,
Hospital for Genetic O. S. REDDI,
Diseases,
Osmania University, Begumpet,
Hyderabad 500 016,
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