Depletion of Ovarian Primordial Follicles after Gamma Irradiation

Tawakal N[1], Mubarak Khalid A[1], Farooq Khan U[2], Raees Ahmad K[3], Asmatullsh[4*]

ABSTRACT

Introduction: Artifical sourace of radiation have increased worldwide average annual exposure of mankind and could especially affect rapidly dividing cells in gonads. Since, radiation sensitivities of different components of primordial follicles, and the time required for their deplation have not been morphologically eatablished we decided to estimate the time required for depletion of primordial follicles and to analyze the morphological changes in primordial follicles after gamma irradiation in rats ovaries.

Material & Method: 108-Female albino rats of 3 weeks age were divided into three groups. Out of them, 36 animals received 4.5 Gray, and 36 received 8.3 Gray of gamma radiation while rest received sham radiation. Then their Ovaries were dissected at 2hrs, 4hrs, 6hrs, one day, 7 days and 14 days after irradiation. Histological examination of five random sections of each ovary was performed.

Results: The stockpile of primordial follicles almost depleted within 24 hours. The pool of primordial follicles was greatly suppressed after irradiation showing primordial follicles radiosensitivity. Intense necrosis was evident with karyorrhexis and karyolysis in nucleus of oocyte while effects on granulosa cells were little and they increased the bulk of interstitial tissues.

Conclusion: Gamma ionizing radiation induces intense and rapid necrotic degeneration of oocyte in primordial ovarian follicles. The granulosa cells of degenerated primordial follicle increase the bulk of ovarian interstitial tissue. Resultant ovaries do not have enough follicular reserve for ovulatory process which may lead to early cessation of menstruation and eventually infertility.

Key words: Gamma radiation Ovary, Oocyte, Granulosa Cells, Necrosis, Rats.

1- Department of Anatomy, King Edward Medical University, Lahore Pakistan.
2- Lahore General Hospital, Lahor Pakistan.
3- Department of Biological Sciences, University of Sargodha, Sargodha, Pakistan.
4- Department Zoology, University of the Punjab, Lahor, Pakistan.
*Corresponding Author: Email: dr.asmatullah@gmail.com , asmat_ullah_9@hotmail.com