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**THE IMPACT OF OCCUPATIONAL MEDICAL RADIATION ON OVARIAN RESERVE
IN HEALTHCARE WORKERS**

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Ovarian reserve is the number and quality of a woman's remaining eggs, and it is a key factor on the insight for female fertility. Naturally, it declines with age. In women who work in healthcare, the decline is faster due to medical radiation exposure. Ovarian reserve markers are anti-Mullerian hormone (AMH), antral follicle count (AFC), follicle stimulating hormone (FSH), and luteinizing hormone (LH). AMH reflects the remaining number of eggs and its levels don't vary during the menstrual cycle as it does for FSH and LH, so AMH is considered as the most sensitive marker of ovarian reserve. Through ultrasound imaging we can visualize the remaining number of follicles (AFC). FSH and LH levels on specific days of the menstrual cycle show the hormonal stress on the ovaries.

Types of medical radiation for which female health care workers are exposed to are, X-ray, computed tomography (CT) scans, interventional fluoroscopy and some radioactive elements such as iodine-131, iodine-123, technetium-99m, phosphorus-32 used in nuclear medicine, and they have specific ways of causing distress. X-rays cause oxidative stress in the gonadal cells, CT scans, and fluoroscopy breaks the DNA strands and radioactive elements used in nuclear medicine damage eggs and the granulosa cells due to prolonged low dose exposure. Radiation further disrupts the hypothalamic pituitary ovarian axis (HPO) by affecting the mitochondria and hormone receptor function. For all types of low dose radiation, the severity of the effect they cause depends on the type, dose, duration, and frequency of exposure. Short term of exposure to such radiation has less impact which most of the time causes no effect but long-term frequent exposures can lead to depletion of ovarian reserve, reduced AMH, elevated FSH and LH, and irregular menstrual cycles.

Disruption of ovarian reserve due to radiation exposure has several effects on a woman's life, which includes fertility reduction, difficulty in conceiving naturally and increasing the requirement of reproductive techniques such as IVF to conceive. This causes emotional stress in women. Disturbances in HPO axis cause hormonal imbalances which leads to irregular menstrual cycles, early menopause and affects the levels of FSH and LH. Hormonal changes also affect the metabolic pathways and cardiovascular health.

Occupational exposure to medical radiation is a threat to ovarian reserve and to the functioning of HPO axis in female healthcare workers. The combined effect of type of radiation, dose, frequency, and duration together decides the severity of the ovarian damage. Monitoring ovarian reserve through a simple blood test to analyze AMH levels and minimizing occupational radiation exposure are important steps to prevent early depletion of ovarian reserve and to predict fertility potential and to reduce emotional distress in women.