Fertility preservation and oocytes quality in ovarian cancer

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Introduction

To improve the quality of life in oncological patients, Fertility Preservation (FP) should be considered part of cancer treatment. Approximately 5400 cases of Ovarian Cancer (OC) are recorded in Italy in 2024 and it is one of the cancers that most negatively impacts fertility in young women. Currently, cryopreservation of Mature Oocyte (MO) is the standard technique for FP. However, studies on ovarian response to Controlled Ovarian Hyperstimulation (COH) in cancer patients remain limited. A few reports suggest that OC may negatively affect follicular development and oocyte quality, but the mechanism remains unclear. A retrospective single-center case-control study was conducted in the *In Vitro* Fertilization (IVF) Unit at the Sandro Pertini Hospital in Rome between 2016 and 2024. A total of 111 women were enrolled in the study, including 49 with OC and 62 infertile patients (male or tubal factor infertility), matched for demographics and type of trigger for oocyte induction (GnRH agonist).

Aims

The aim of this study was to assess the influence of OC on ovarian response in terms of total MO, percentage of Immature Oocytes (IO) and Abnormal Oocytes (AO) retrieved in these oncological patients compared to not oncological patients undergoing COH for IVF for male or tubal factor infertility. The primary outcome was number and quality of oocytes retrieved. Statistical analysis was performed using the t-test for normally distributed variables and the Wilcoxon test for non-normally distributed variables to assess group differences.

Results

The demographic characteristics in the group of oncological patients were: median age 26.1 years, median BMI 22.6, median serum AMH level 1.51 ng/ml, while those in the control group were: median age 32.4 years, median BMI 21.1, median serum AMH level 3.95 ng/ml. The analysis revealed that OC patients required higher gonadotrophin doses than control group (2700 U vs 1350 U, $p < 0.001$) even though the median lenght of stimulation did not show statistically significant differences (12 vs 11., $p= 0.353$). There were no statistically significant differences in terms of total retrieved oocytes (10.1 vs 11.5, $p = 0.265$), total MO (7 vs. 8, $p = 0.177$), IO (0 vs 1, $p = 0.401$) and total AO (0 vs 1, $p = 0.689$). In conclusion, the diagnosis of OC does not seem to be associated with an impairment of the ovarian response to COH in term of total MO retrieved, AO and IO.

Conclusions

Although this condition affects the ovary, the OC diagnosis does not appear to be a risk factor in obtaining fewer mature, immature or abnormal oocytes. Further studies are necessary to evaluate the etiopathogenetic mechanisms underlying oocyte abnormalities in this specific group of female oncology patients. The study has limitations, including its retrospective design, small sample size and inability to match groups by age, because IVF patients for OC are usually younger and by serum AMH level, because at the time of FP, the majority of patients in the oncological group had already undergone ovarian surgery.

Recommended reading

- *ESHRE Guideline Group on Female Fertility Preservation; Anderson RA, Amant F, Braat D, et al. ESHRE guideline: female fertility preservation. Hum Reprod Open. 2020;2020(4):hoaa052.*
- *Gadducci A, Aletti GD, Landoni F, et al. Management of ovarian cancer: guidelines of the Italian Medical Oncology Association (AIOM). Tumori. 2021;107(2):100-9.*
- *Ledermann JA, Matias-Guiu X, Amant F, et al. ESGO-ESMO-ESP consensus conference recommendations on ovarian cancer. Ann Oncol. 2024;35(3):248-66.*
- *Santos ML, Pais AS, Almeida Santos T. Fertility preservation in ovarian cancer patients. Gynecol Endocrinol. 2021;37(6):483-9.*