Fertility Preservation in Young Oncology Patients: Reproductive Outcomes Across Cancer Types

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BACKGROUND AND AIMS

With improving cancer survival rates, fertility preservation has become essential for reproductive-age women facing oncologic treatment.[1,2] Cancer therapies often compromise ovarian function, creating an urgent need for effective preservation strategies.[3]

This systematic review and meta-analysis synthesises evidence on egg/embryo cryopreservation and ovarian tissue cryopreservation (OTC) across cancer types, providing evidence-based guidance for clinical decision-making.[4]

MATERIALS AND METHODS

A comprehensive systematic review and meta-analysis was conducted following PRISMA guidelines. The search strategy encompassed PubMed, Embase, Cochrane Library, and relevant conference proceedings up to December 2024.

Eligibility criteria included observational studies and clinical trials reporting fertility preservation outcomes in women under 45 years of age with various cancer diagnoses. Studies comparing fertility sparing approaches (egg/embryo cryopreservation, OTC) with or without comparator groups were included if they reported reproductive outcomes (live birth, clinical pregnancy), hormonal outcomes (menstrual resumption, ovarian reserve markers), or counselling-related data.

Two independent reviewers performed study selection, data extraction, and quality assessment using standardised tools. Extracted information included cancer type, patient age, preservation method, assisted reproductive technology utilisation, follow-up duration, reproductive outcomes, hormonal parameters, and counselling content. Statistical analysis involved random-effects meta-analysis where feasible, with outcomes reported as pooled odds ratios or risk ratios with 95% CIs. Heterogeneity was assessed using I^2 statistics, and subgroup analyses were conducted by preservation method and cancer type. Sensitivity analyses tested the robustness of findings.

RESULTS

Egg/embryo cryopreservation demonstrated consistent feasibility across cancer types, with higher confidence in live birth data for breast and haematologic cancers where patients pursued assisted reproductive technology prior to adjuvant therapy.[1,5,6] Clinical pregnancy rates and live birth outcomes varied by cancer type and patient age.[2,5] Time to first pregnancy post-treatment ranged from several months to several years, influenced by subsequent treatment and ovarian reserve.

OTC showed potential for restoration of ovarian function and subsequent pregnancies, particularly when immediate

cancer treatment was not delayed.[6,7] Spontaneous pregnancies were reported following successful OTC procedures.[6] However, live birth and time-to-pregnancy estimates were less precise than for egg/embryo cryopreservation due to smaller sample sizes and longer follow-up requirements.[2,6]

Hormonal implications revealed resumption of menses and ovarian function in a substantial proportion of patients, with variations by chemotherapy exposure, patient age, and cancer type. Markers of ovarian reserve (anti-Müllerian hormone) generally declined post-treatment, but showed variable recovery after successful preservation and pregnancy attempts.[8]

Counselling and decision-making studies highlighted the importance of multidisciplinary counselling, including realistic success rates, potential delays to cancer therapy, and psychosocial considerations.[9] No consistent signal of increased cancer recurrence attributable to fertility preservation strategies was observed across included studies, though data remain limited.[1,10,11]

CONCLUSION

Fertility preservation represents a viable option for young patients with cancer. Egg/embryo cryopreservation currently enjoys the strongest evidence base for subsequent fertility and live birth across several cancer types,[1,5] while OTC offers meaningful possibilities for ovarian function restoration with growing evidence.[6] Individualised, multidisciplinary counselling incorporating cancer type, planned therapies, patient age, and personal fertility goals remains paramount. High-quality prospective studies with standardised reporting are needed to refine clinical recommendations and optimise patient-centred decision-making.

References

1. White R et al. Fertility preservation, its effectiveness and its impact on disease status in premenopausal women with breast cancer: a systematic review and meta-analysis. Eur J Obstet Gynecol Reprod Biol. 2023;287:8-19.
2. Bewtra C, Acharya N. Preservation of fertility in cancer patients: a narrative review. Cureus. 2023;15(10):e47910.
3. Boutas I et al. Breast cancer and fertility preservation in young female patients: a systematic review of the literature. Clin Pract. 2023;13(6):1413-26.
4. Kondrashkina K, Axenova A. Fertility preservation in young oncology patients: reproductive outcomes across cancer types. Poster 186. ISGE Congress, 4-6 March, 2026.
5. Dolmans MM et al. Utilization rates and results of long-term embryo cryopreservation before gonadotoxic treatment. J Assist Reprod Genet. 2015;32(8):1233-7.
6. Fraison E et al. Live birth rate after female fertility preservation for cancer or haematopoietic stem cell transplantation: a systematic review and meta-analysis of the three main techniques; embryo, oocyte and ovarian tissue cryopreservation. Hum Reprod. 2023;38(3):489-502.
7. Jensen AK et al. Outcomes of transplantations of cryopreserved ovarian tissue to 41 women in Denmark. Hum Reprod. 2015;30(12):2838-45.
8. Dittrich R et al. Pregnancies and live births after 20 transplantations of cryopreserved ovarian tissue in a single center. Fertil Steril. 2015;103(2):462-8.
9. Zaami S et al. Fertility preservation in female cancer sufferers: (only) a moral obligation? Eur J Contracept Reprod Health Care. 2022;27(4):335-40.
10. Arecco L et al. Safety of fertility preservation techniques before and after anticancer treatments in young women with breast cancer: a systematic review and meta-analysis. Hum Reprod. 2022;37(5):954-68.
11. Erden M et al. Utility and outcomes of ovarian tissue cryopreservation and transplantation for gynecologic cancers: a systematic review and meta-analysis. Obstet Gynecol. 2024;144(4):481-92.