

Reproductive Outcomes After Chemotherapy in Young Women With Non-Hodgkin Lymphoma: A Systematic Review and Meta-Analysis

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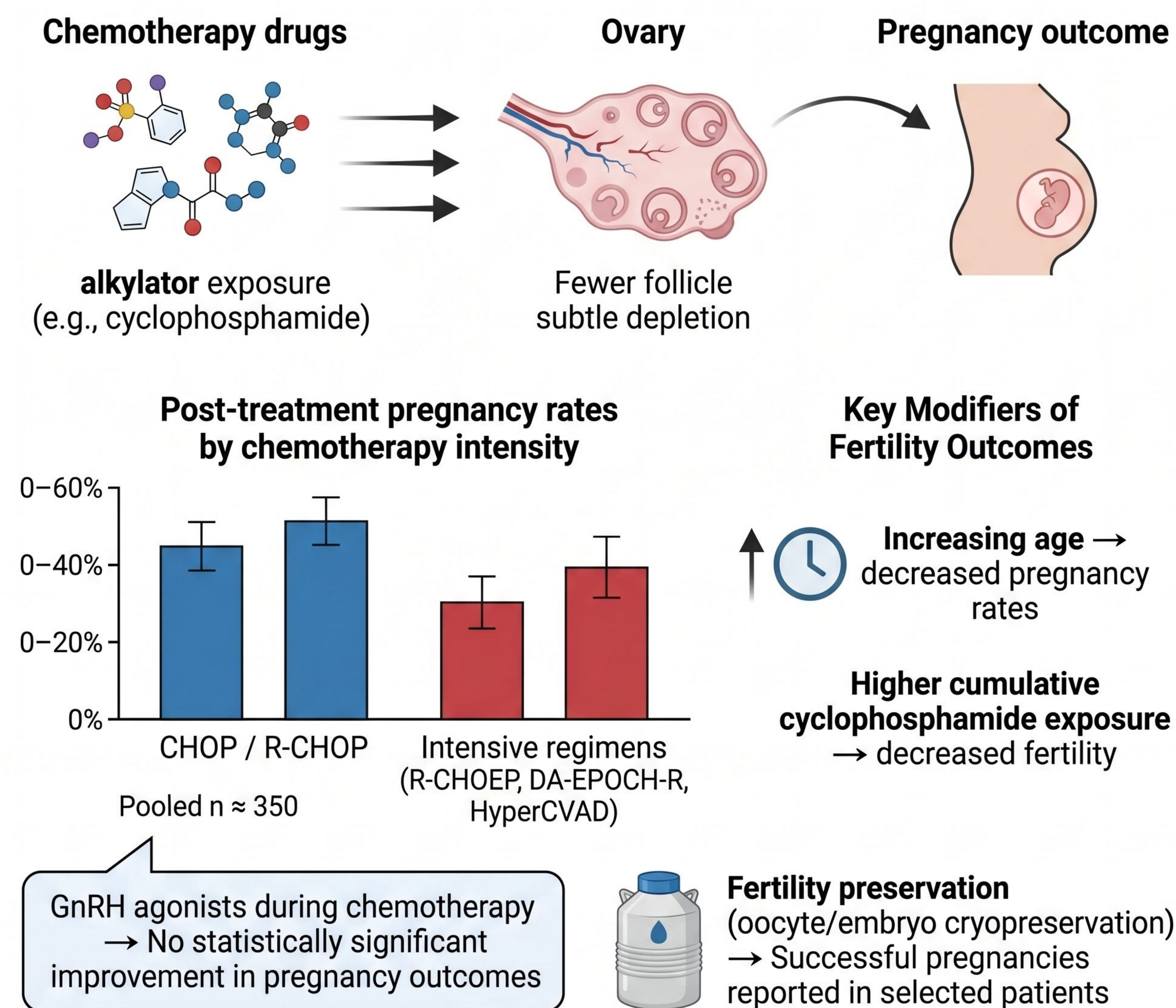
INTRODUCTION

With improving survival in young women with non-Hodgkin lymphoma (NHL), fertility outcomes have become an important survivorship concern. Chemotherapy-related gonadotoxicity varies by regimen, yet pregnancy outcomes after modern NHL treatments remain incompletely characterized. We performed a systematic review and meta-analysis to evaluate post-treatment pregnancy rates in young female NHL survivors across chemotherapy regimens and to assess the impact of fertility preservation strategies.

METHODS

A systematic literature search of PubMed, Embase, and Cochrane Library from inception through December 2024 was conducted following PRISMA guidelines. Eligible studies included reproductive aged women with NHL treated with systemic chemotherapy and reporting post treatment pregnancy outcomes. The primary endpoint was post treatment pregnancy rate. Secondary analyses included chemotherapy regimen type and use of fertility preservation strategies. Random effects meta analysis was used to pool pregnancy rates. Heterogeneity was assessed using I^2 statistics.

Determinants of Post-Chemotherapy Reproductive Outcomes in Young Women With Non-Hodgkin Lymphoma



RESULTS

Twelve observational studies comprising approximately 350 young female NHL survivors met inclusion criteria. The pooled post treatment pregnancy rate was 45% (95% CI, 38–52), with moderate heterogeneity ($I^2 = 46\%$). CHOP and R CHOP based regimens demonstrated the highest pregnancy rates, ranging from 45% to 55%. More intensive regimens, including R CHOEP, dose adjusted EPOCH R, and Hyper CVAD, were associated with slightly lower but still favorable pregnancy rates (30–45%), particularly in women under 35 years of age. Increasing age at treatment and higher cumulative cyclophosphamide dose were consistently associated with reduced pregnancy rates. Use of gonadotropin releasing hormone agonists during chemotherapy was not associated with a statistically significant improvement in pregnancy outcomes. Most reported pregnancies occurred without assisted reproductive technologies, although successful pregnancies following oocyte or embryo cryopreservation were described in selected patients.

CONCLUSIONS

Nearly half of young women treated for NHL are able to achieve pregnancy after chemotherapy, particularly following standard CHOP based regimens. While intensified regimens may carry increased gonadotoxic risk, meaningful fertility potential remains in younger patients. Routine use of ovarian suppression alone does not appear to improve pregnancy outcomes. These findings support individualized fertility counseling and early referral for fertility preservation in higher risk patients while reassuring many young women with NHL regarding post treatment reproductive potential.

Clinical Relevance

- Nearly half of young women with NHL achieve pregnancy after chemotherapy (~45%)
- Fertility outcomes vary by chemotherapy intensity and patient age
- Ovarian suppression alone does not improve pregnancy rates
- Early fertility counseling and preservation are critical in higher-risk patients