

E16.51

Pregnancy-associated cancer and short-term neonatal outcomes: a nationwide population-based cohort study

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Background

With the increasing incidence of early-onset cancer, the scenario of Pregnancy-associated cancer (PAC) is also on the rise. We aimed to study long-term offspring outcomes following PAC in a population-based study.

Methods

We conducted a retrospective cohort study using electronic medical records from Clalit Health Services, Israel’s largest integrated healthcare system. Pregnancies among women aged 18–45 years between 1999 and 2025 were identified including PAC and matched non-PAC (controls). As PAC defined to cancer diagnosed during pregnancy or until 1year post delivery, cases were categorized by cancer diagnosed during pregnancy (PAC-DP) and post-delivery (PAC-PD). Annual incidence rates were calculated overall and by maternal age group. To assess long-term child outcomes, we included all identified PAC cases and their offspring. Cox regression models were used and hazard ratio (HR) with 95%confidence interval (CI) were reported as measure of association.

Results

The cohort included 5333 PAC and 44,550 matched non-PAC participants ; 2077 were PAC-DP and 3250 PAC-PD. Breast cancer was the most frequent invasive PAC. PAC was associated with higher risks of inflammatory/immune-related conditions. PAC-PD cohort revealed similar pattern to the PAC-DP cohort, and due to increased sample size in the PAC-PD cohort, trends depicted stronger correlation:

- Inflammatory bowel disease (HR 1.24;95%CI: 1.06-1.44 in the PAC-DP, 1.19;95%CI: 1.06-1.35 in the PAC-PD).
- Allergic conditions (HR 1.18; 95%CI: 0.98-1.42 in the PAC-DP, 1.21; 1.05-1.40 in the PAC-PD).
- Asthma (HR 1.14; 95%CI: 0.98-1.33 in the PAC-DP, 1.03;95%CI0.91-1.16 in the PAC-PD)
- Cardiovascular morbidity (1.11;95%CI:0.95-1.30 in the PAC-PD)
- Endocrinological conditions (HR 1.51;95%CI: 1.20-1.90 in the PAC-PD).



Conclusions

Our results indicate the PAC may be associated with increased risk of long-term inflammatory/immune-related conditions in the offsprings. Unexpectedly cancer itself during pregnancy may induce subsequent prenatal long-term sequel. Ongoing analyses and preclinical models will further elucidate the underlying mechanism and the implications for maternal–child survivorship care.