Intriguing Effect of Myeloproliferative Neoplasms on Pregnancy Outcomes: Comprehensive Propensity Matched Multicenter Retrospective Analysis

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Introduction

Pregnancy in the context of myeloproliferative neoplasms (MPN) poses unique fetal and maternal challenges. Current literature in this regard is lacking.

Aim

This study investigates the effect of MPN (excluding CML) on pregnancy outcomes.

Methods

We conducted a multicenter retrospective study using the TrinetX database network, a federated electronic medical record network. Statistical analysis is performed on the TrinetX research platform. Baseline demographics and clinical features were collected. Subsequently, multivariate logistic regression was performed to determine the odds ratio (OR) of various maternal and fetal complications, on a 1:1 propensity-matched sample.

Results

We included 4,411,981 pregnant women, and MPN was identified in 0.14% (n= 6427) patients. ET is the most common MPN (94%, n=6035), followed by PV (6%, n=385). The MPN cohort was older (mean age 29.4 yrs vs 27.2 yrs) and had higher cardiovascular risk factors, e.g., DM (7.5% vs. 0.7%), HTN (12.4% vs. 1.1%), and Obesity (15.2% vs. 1.8%).

Table 1: Baseline characteristics

Baseline features	Pregnancy with MPN (n=6421)(%)
Mean age (± SD)	29.4 (± 6.1)
Type of MPN ET PV PMF	 6035 (94) 385 (5) 64 (1)
Aspirin (ASA) therapy	1077 (15.9)
History of prior thrombosis	422 (6.2)

Conclusions

These results emphasize that pregnancy with MPN is associated with significantly higher maternal and fetal complications, necessitating close monitoring, personalized care, and multidisciplinary collaboration to optimize outcomes.

Table 2: Multivariate logistic analysis of the PSM sample for maternal and fetal outcomes

Complications	Pregnancy with MPN (n=6421) (%)	Pregnancy without MPN (n=6421) (%)	Odds ratio (95%CI)
Gestational HTN	500 (7.7)	390 (6.0)	1.3 (1.1-1.4)
Pre-eclampsia	55 (0.8)	20 (0.3)	2.7 (1.6-4.6)
Eclampsia	36 (0.6)	12 (0.2)	3.0 (1.5-5.7)
Abruptio Placenta	61 (0.9)	36 (0.6)	1.7 (1.1-2.5)
Polyhydramnios	145 (2.2)	96 (1.4)	1.5 (1.1-1.9)
Preterm Labor	222 (3.4)	133 (2.0)	1.6 (1.3-2.1)
VTE events	**249 (3.8)**	**36 (0.5)**	**7.1 (5.0-10.1)**
Postpartum hemorrhage	417 (6.4)	250 (3.8)	1.7 (1.4-2.0)
Maternal mortality	**54 (0.8)**	**10 (0.1)**	**5.4 (2.7-10.8)**
Intrauterine fetal death	40 (0.6)	21 (0.3)	1.9 (1.1-3.2)
Intrauterine growth retardation	382 (5.9)	261 (4.0)	1.4 (1.2-1.7)

PSM: Propensity score matched; HTN: Hypertension; VTE: Venous thromboembolic events; Baseline characteristics like age, sex, race, and comorbidities, impact of ASA/anticoagulation were included in propensity score matching and logistic regression analysis. The impact of therapies could not be assessed.

Subgroup analysis based on the history of prior thrombotic events

On subgroup analysis based on prior history of thrombotic events among pregnant patients with MPN, there was no significant difference in any of the maternal and fetal outcomes except for increased maternal mortality in those patients with prior history of thrombosis (3.7% vs 0.5%; OR: 6.5 (95%CI: 3.9-10.9)(P <0.001)

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