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FETO-MATERNAL OUTCOMES OF THROMBOCYTOPENIA IN PREGNANCY

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Abstract

The purpose of this study was to assess the feto-maternal consequences of thrombocytopenia during pregnancy and to find meaningful associations between bad outcomes and maternal risk factors.

Study design:

Descriptive cross-sectional study. This study was carried out at department of Obstetrics and Gynecology, CMH Gujranwala from April 2025 till 15 July 2025.

Methods and materials:

Convenience sampling was used to register 100 pregnant women in CMH Gujranwala between the ages of 18 and 40 who had a gestational age of more than 24 weeks and a diagnosis of thrombocytopenia (platelet count <150×10³/mm³). Pancytopenia and persistent systemic diseases were among the exclusion criteria. Demographic information, reservation status, way of life, and thrombocytopenia history were documented. Preterm birth, low birth weight, and neonatal thrombocytopenia were among the fetal results, while anemia, abruption, and intrauterine death (IUD) were among the maternal outcomes. To evaluate relationships with $p \leq 0.05$ deemed significant, the chi-square test was utilized.

Results:

The average gestational age was 28.22 ± 6.06 weeks, and the average maternal age was 28.53 ± 6.77 years. The most common maternal complications were anemia (80%), placental abruption (22%), and IUD (15%). Half of the newborns had neonatal thrombocytopenia. Un-booked status was significantly associated with premature birth ($p = 0.041$), anemia ($p < 0.001$), and IUD ($p < 0.001$). Negative outcomes were also substantially associated with a sedentary lifestyle and a past or family history of thrombocytopenia.

Conclusion:

Pregnancy-related thrombocytopenia is associated with major problems for both the mother and the unborn child. Prenatal booking, routine monitoring, and early identification are essential for minimizing negative effects.

Introduction:

Thrombocytopenia during pregnancy is a hematological disorder that runs for many different causes, from thrombocytopenia in benign pregnancy to serious conditions such as pre -eclampsia, HELLP syndrome and idiopathic thrombocytopenia purpura(1). It causes significant risks to the mother and fetus, especially the

complications of bleeding, premature birth, limiting the growth of the fetus and the death rate(2). Thrombocytopenia is defined as a platelet count of less than 150 x10^3/mm(3).

Thrombocytopenia affects about 6% to 15% of all cases of pregnancy(4). Gestational thrombocytopenia is the most common, responsible for about 50% to 70% of cases determined during pregnancy(5). Most cases are diagnosed in the third trimester and this situation is often observed in Primigravida women and those under 30 years old(6). In addition to the causes of pregnancy, hypertension pregnancy disorders, such as pre -eclampsia and eclampsia, are important contributors, accounting for 20% of cases. Other risk factors include anemia, infection and underlying hematological disorders.

Although secondary causes of thrombocytopenia brought on by infections, HELLP syndrome, or preeclampsia might have major consequences, gestational thrombocytopenia is usually benign and linked to positive outcomes. Postpartum hemorrhage, placental abruption, the need for platelet or blood transfusions, and, in extreme situations, admission to critical care units is among the hazards that mothers face(7). According to one prospective study, up to 14.6% of thrombocytopenic pregnancies resulted in postpartum hemorrhage, 21.8% in placental abruption, and in rare but serious cases, maternal death(8). With higher risks of preterm delivery, fetal growth restriction, an intrauterine death, and neonatal thrombocytopenia, fetal problems are also noteworthy. Recent research, for example, has shown that neonatal thrombocytopenia occurs in 4.5% of affected pregnancies, intrauterine death occurs in 5.7%, and fetal growth restriction occurs in 12% to 20% of affected pregnancies(5,8). Negative neonatal outcomes, such as increased rates of preterm birth, low birth weight, and the need for neonatal critical care, are strongly linked to the severity of maternal thrombocytopenia. These results highlight how crucial early discovery, consistent observation, and interdisciplinary management are to reducing negative consequences.

Materials and Methods:

After approval of ethical review committee this descriptive cross-sectional survey was conducted at department of Obstetrics and Gynecology, CMH Gujranwala from April 2025 till 15 July 2025 to determine the feto-maternal outcomes of thrombocytopenia in pregnancy. Convenience sampling was used to collect responses from Females of age 18-40 years, parity <5, presenting at gestational age >24 weeks, diagnosed with thrombocytopenia in pregnancy were included. Responses were collected in April-May 2025. Females with pancytopenia, bone marrow suppression or past or current SARS-CoV-2 positive status (on medical record) and females with chronic diabetes (OGT>186 mg/dl), thyroid dysfunction (TSH>5IU), renal dysfunction (creatinine>1.8 mg/dl), liver failure (ALT & AST >40 IU) were excluded from the study. By using WHO calculator, sample size of 100 cases was calculated with 95% confidence level, 6.5% margin of error and percentage of anemia i.e. 12% in females with thrombocytopenia in pregnancy. A self-made offline questionnaire was used to collect data from participants during the interview.

The questionnaire had three sections: Patient identifying information, such as case number, registration number, date, name, spouse's name, age, gestational age, BMI, and parity, was gathered in the first section. The second section included the antenatal profile prenatal profile, which includes information on lifestyle (active or sedentary), booking status (booked or un-booked), and relevant medical history, including any history of thrombocytopenia in a prior pregnancy and any family history of the condition. The third section is follow-up which included assessment of outcomes such as anemia, abnormal AFI, intrauterine death, abruption, preterm birth, low birthweight and neonatal thrombocytopenia.

After approval from ethical review board, 100 females fulfilling the selection criteria was enrolled from OPD. Informed consent was be taken. Demographics were noted. Then blood samples were taken in 5cc disposable syringe and were sent to the laboratory of the hospital for assessment of hemoglobin level to rule out anemia. Ultrasound

was done to determine AFI level to rule out abnormal AFI level, and intrauterine death. All females were followed-up in OPD until delivery. Females were asked to present in emergency labor room in case of abruption. At delivery, gestational age was noted and if delivery occurred before 37 weeks, then preterm delivery was noted. On birth, neonatal weight was assessed and low birth weight was noted. Blood samples were taken for assessment of platelet count at birth. Reports were assessed and if platelet count $<150x10^3/L$, then neonatal thrombocytopenia was labeled. All this information was recorded in questionnaire.

Data was entered and analyzed in SPSS 27. Normality was checked by Shapiro-Wilk test with value >0.05 which suggest the data as non-normal. Quantitative variables like age, gestational age, BMI, scar thickness are presented as mean and standard deviation. Qualitative variables like parity, booking status, life style, family history of thrombocytopenia, previous history of thrombocytopenia and feto-maternal outcomes (anemia, abnormal AFI, abruption, preterm delivery, low birth weight, neonatal thrombocytopenia and intrauterine death) are presented as frequency and percentage. Non-normal test such as Chi square was applied to check association of parity, booking status, life style, family history of thrombocytopenia in any pregnancy, previous history of thrombocytopenia in any pregnancy with anemia, abnormal AFI, intrauterine death, abruption, preterm birth, low birthweight and neonatal thrombocytopenia. P-value ≤ 0.05 was taken as significant. Missing values were not replaced, and a significance level of $p < 0.05$ with a 95% confidence interval (CI) was adopted for all analyses.

Results:

One hundred pregnant women in all were enrolled in the study. The average gestational age was 28.22 ± 6.06 weeks, and the average age was 28.53 ± 6.77 years. A BMI of 23.70 ± 3.16 kg/m² was the average. Twenty percent were primiparous (parity 1), sixteen percent were parity 2, ten percent were parity 3, twenty-one percent were parity 4, and eighteen percent were parity 5. Of the participants, half (50%) had cases booked, and the other half (50%) did not. 60% of them had a sedentary lifestyle, while 40% were physically active. Of the women, 34% reported having a family history of thrombocytopenia, while 66% did not. Additionally, 75% of the subjects did not disclose any prior history of thrombocytopenia during pregnancy, whereas 25% did.

Table 1:Demographic Characteristics

Variable		Total	Percentage %	Mean ± S.D
Age		100	100%	28.53 ± 6.77 years
Gestational Age		100	100%	28.22 ± 6.06 weeks
BMI		100	100%	23.70 ± 3.16 kg/m²
Parity	1	20	20%	
	2	16	16%	
	3	10	10%	
	4	21	21%	
	5	18	18%	
Booking Status	Booked	50	50%	
	Un-booked	50	50%	
Lifestyle	Active	40	40%	
	Sedentary	60	60%	

Family History of Thrombocytopenia	Yes	34	34%	
	No	66	66%	
Previous History of Thrombocytopenia	Yes	25	25%	
	No	75	75%	

Eighty percent of the patients had anemia, the most prevalent maternal problem, whereas twenty percent did not. While 73% of patients had normal amniotic fluid index (AFI), 27% of cases had abnormal AFI. Of the pregnancies, 85% resulted in live births, whereas 15% ended in intrauterine death. Twenty-two percent of cases experienced placental abruption, while seventy-eight percent did not. The majority of births (96%) were at term, with preterm births occurring in only 4% of instances. While 73% of the newborns had normal birthweights, 27% of the deliveries had low birthweight babies. Notably, 50% of the neonates had neonatal thrombocytopenia, suggesting that half of the cases under study had a major fetal impact.

Table 2: Feto-maternal Outcomes

Variable		Total	Percentage %
anemia	Yes	80	80%
	No	20	20%
abnormal AFI	Yes	27	27%
	No	73	73%
intrauterine death	Yes	15	15%
	No	85	85%
abruption	Yes	22	22%
	No	78	78%
preterm birth	Yes	4	4%
	No	96	96%
low birthweight	Yes	27	27%
	No	73	73%
neonatal thrombocytopenia	Yes	50	50%
	No	50	50%

To assess the relationships between maternal risk variables and feto-maternal outcomes, chi-square analysis was used. Anemia and booking status were found to be statistically significantly correlated ($\chi^2 = 25.000$, $p < 0.001$), suggesting that patients who were not booked had a higher likelihood of being anemic. Additionally, there was a significant correlation between booking status and preterm birth (PTB) ($\chi^2 = 4.167$, $p = 0.041$) and intrauterine death (IUD) ($\chi^2 = 17.647$, $p < 0.001$). Lifestyle variables also demonstrated considerable relationships, with sedentary women more likely to have anemia ($\chi^2 = 37.500$, $p < 0.001$), abnormal AFI ($\chi^2 = 24.658$, $p < 0.001$), and IUD ($\chi^2 = 11.765$, $p = 0.001$). Both placental abruption ($\chi^2 = 54.751$, $p < 0.001$) and newborn thrombocytopenia ($\chi^2 = 51.515$, $p < 0.001$) were substantially correlated with a family history of thrombocytopenia, suggesting a strong familial influence on these outcomes.

Table 3: Chi Square test between maternal risk factors and Feto-maternal outcome

Variable Pair	χ^2 Value	df	p-value	Significance
Booking Status × Anemia	25.000	1	< 0.001	Significant
Booking Status × IUD	17.647	1	< 0.001	Significant
Booking Status × PTB	4.167	1	0.041	Significant
Lifestyle × Anemia	37.500	1	< 0.001	Significant
Lifestyle × Abnormal AFI	24.658	1	< 0.001	Significant
Lifestyle × IUD	11.765	1	0.001	Significant
Family History × Abruption	54.751	1	< 0.001	Significant
Family History × Neonatal Thrombocytopenia	51.515	1	< 0.001	Significant
Previous Thrombocytopenia × Anemia	8.333	1	0.004	Significant
Previous Thrombocytopenia × IUD	52.941	1	< 0.001	Significant
Previous Thrombocytopenia × PTB	12.500	1	< 0.001	Significant
Previous Thrombocytopenia × Neonatal Thrombocytopenia	33.333	1	< 0.001	Significant

Discussion:

Thrombocytopenia is a major complaint of the pregnant women. There is some physiological decrease due to hemodilution(9). Some women present with gestational thrombocytopenia with platelet count below $150\times10^3/mm^3$.

Majority of the women suffering from thrombocytopenia were multiparous which align with the findings reported in the study conducted in India(10). The greater risk of pregnancy-related problems such preeclampsia, dietary inadequacies, and recurrent immunological sensitization may be the causes of multiparous women's higher prevalence of thrombocytopenia(11). Platelet decrease is a result of these variables, which tend to build with each subsequent pregnancy. Our study revealed increased incidence of anemia after delivery in pregnant women who were suffering from gestational thrombocytopenia. This finding align with the study which reported anemia postnatally due to post-partum hemorrhage and episiotomy related excessive bleeding(12).

4% preterm birth, 27% low birth weight, 15% intrauterine death, 50% neonatal thrombocytopenia was reposted in our study which aligns with the studies conducted in India and Iraq(12,13). Poor maternal nutrition, placental insufficiency, and underlying immunological or hypertensive problems that are frequently linked to maternal thrombocytopenia may be the cause of the unfavorable fetal outcomes. Fetal and neonatal thrombocytopenia can also result from immune-mediated platelet degradation that crosses the placenta(14). Maternal platelet levels that are significantly lowered or improperly controlled during pregnancy increase the risk of several problems. This study's relevance and validity are increased by a number of its strengths. Accurate documentation of maternal and newborn outcomes was made possible by the clinical environment and real-time follow-up. All participants' data collection was standardized thanks to the questionnaire's structured form. Furthermore, the study offers important insights into the complex nature of unfavorable feto-maternal outcomes by investigating relationships between thrombocytopenia and several risk variables, including economic status, lifestyle, and

medical history. The limitations include non-generability, the results might not apply to different demographics or healthcare environments because the study was conducted at a single location and lasted only two months. Convenience sampling raises the possibility of selection bias, and the cross-sectional design makes it impossible to show causality. Furthermore, even with the application of exclusion criteria, results could have been impacted by lingering confounding variables including socioeconomic status, nutritional deficits, or undetected illnesses. Notwithstanding these drawbacks, the study provides a basic understanding of the clinical relevance of thrombocytopenia during pregnancy and emphasizes the necessity of more extensive, multicenter prospective investigations to confirm and build on these results.

Conflict of Interest:
The authors showed no conflict of interest.

Ethical Considerations:
The ethical approval was obtained from the ethical review board of CMH Gujranwala. The informed consent was taken from all participants. Research was conducted with participants' confidentiality.

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