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Original Research Article

TO EVALUATE THE EFFECT OF THROMBOCYTOPENIA ON FETOMATERNAL OUTCOME IN PREGNANCY

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Abstract

Background: Thrombocytopenia is frequently diagnosed among pregnant women with an incidence of between 7 and 12%. Therefore, decisions regarding subsequent examination and management are primordial. Majority of these are due to physiological changes, as gestational thrombocytopenia, other causes can lead to severe conditions resulting in fetal or maternal death. The aim of the present study to evaluate the thrombocytopenia in Pregnancy. **Materials and Methods:** This prospective observational study was conducted in the department of Obstetrics and gynaecology, IMS and SUM Hospital, Bhubaneswar, Odisha between March 2022 to March 2023. The study included 75 antenatal women with thrombocytopenia. After informed consent, pregnant women were interviewed for detailed demographic, past, personal and family history. Complete blood count was done by using automated cell counters in haematology lab which was confirmed by doing peripheral blood smear examination. **Result:** Majority of women had gestational age of 33-36 weeks (52.0%). Thrombocytopenia was found to be Mild among 12.0%, Moderate among 52.0% and Severe among 36.0% women. Majority of the women had Thrombocytopenia due to Gestational cause (48.0%) followed by Obstetrical (28.0%) and Medical (24.0%). The major maternal morbidity were ARF (renal failure) and Pulmonary edema among 12.0% women followed by massive haemorrhage and puerperal sepsis was reported among 8.0% and DIC among 8.0% women. **Conclusion:** Thrombocytopenia should be evaluated by making a practice of routinely checking the platelet count and peripheral smear in early pregnancy and also in third trimester to enable early diagnosis since most cases may be asymptomatic.

INTRODUCTION

Thrombocytopenia, characterised by a platelet count of 150,000 mm3, is a common pregnancy diagnosis, occurring in 7 to 12% of pregnancies. Mild thrombocytopenia is defined as platelet counts greater than 100,000 mm3, moderate as platelets between 50,000 and 100,000 mm3, and severe as platelets less than 50,000 mm3.3 It could be caused by physiologic changes or pathological disorders, some of which are unique to pregnancy and can endanger both mother and child.[1]

During a normal pregnancy, platelet count decreases physiologically due to haemodilution, increased consumption in peripheral tissue, and increased aggregation (higher levels of thromboxane A2). Pregnancy thrombocytopenia is moderate and has no negative consequences for the mother or foetus. Significant thrombocytopenia caused by medical problems, on the other hand, might have substantial maternal-fetal effects and necessitates careful monitoring and control.[2,3]

Thrombocytopenia in pregnancy can be caused by gestational thrombocytopenia (GT) or obstetric disorders such as hypertensive disorders of pregnancy [(preeclampsia, eclampsia and related complications such as hemolysis elevated liver enzymes and low platelets (HELLP)], amniotic fluid embolism, disseminated intravascular coagulopathy (DIC), or medical causes such as thrombotic thrombocytopen Other possible reasons include spurious/pseudothrombocytopenia and drug-induced thrombocytopenia.[4,5] Thrombocytopenia is commonly associated with mucosal bleeding as a result of a primary hemostasis deficiency.[1,6] As a result, clinical manifestations include epistaxis, gingival bleeding, or irregular uterine bleeding, as well as petechiae and ecchymosis. Life-threatening bleeding is uncommon and only occurs in people with extremely low platelet counts, manifesting as

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hematuria, gastrointestinal bleeding, and, in rare cases, cerebral haemorrhage.1 Platelet counts more than 50,000 mm3 are usually asymptomatic if their function is intact.[3]

A comprehensive medical history, including medicines, medical problems, and a physical assessment, is required. Complete blood count, peripheral blood smear, liver and renal function tests, coagulation studies, antiphospholipid antibodies, antinuclear antibodies, human immunodeficiency virus (HIV) serology, hepatitis C antibody, and hepatitis B surface antigen should all be performed.[2,7] Immune thrombocytopenia caused by the development of IgG antiplatelet antibodies towards endogenous platelet membrane glycoproteins is characterised by early gestation platelet count below one lakh and elevated megakaryocyte level on bone marrow biopsy. Pregnancy has no effect on the progression of this illness, however severe thrombocytopenia may bring about significant morbidity and mortality in the foetus.[8]

In the third trimester of pregnancy, preeclampsia is a prevalent cause of thrombocytopenia. The chance of developing thrombocytopenia in preeclampsia is approximately 18%, 10-12% in DIC, and 4-15% in HELLP syndrome.9 In these circumstances, the conventional treatment would be medical stabilisation and prompt delivery after 34 weeks. If this is the case, maternal health takes precedence.

Women of reproductive age are disproportionately affected by systemic lupus erythematosus (SLE). Disease exacerbation during SLE pregnancy present difficulties in separating physiologic changes associated with pregnancy from disease-related symptoms. To optimise both maternal and foetal outcomes, an integrated strategy with close medical, obstetric, and neonatal surveillance is required.[10]

Individual cases of thrombocytopenia in pregnancy are evaluated by ruling out major underlying causes and comparing the likelihood of haemorrhage in both mother and baby against the dangers of diagnostic and therapeutic measures.[9]

Because the literature on this topic is lacking in the Indian setting, the current study was conducted to analyse the occurence and severity of thrombocytopenia in pregnancy, as well as the factors associated with it.

MATERIALS AND METHODS

This prospective observational study was done between March 2022 and March 2023 in the department of Obstetrics and Gynaecology, IMS and SUM Hospital, Bhubaneswar, Odisha, with approval from the Board of Studies and the Ethical Committee. The study population included 75 prenatal women attending the department of Obstetrics and Gynaecology at any gestational age with platelet count less than 150 109/L. The study excluded women who refused to participate and those with normal platelet counts.

Cases were defined as pregnant women with platelet counts fewer than 150 109 /L, mild cases as platelet counts between 100 and 150 109 /L, moderate as platelet counts between 50 and 100 109 /L, and severe as counts less than 50 109 /L.

Pregnant women were questioned for detailed socioeconomic, demographic, historical, personal, and family histories after providing informed consent. A complete blood count was performed at the hospital's haematology lab using automated cell counters; this was confirmed by doing a peripheral blood smear test.

Statistical Analysis

The data was entered into a Microsoft Excel spreadsheet, and the data was analysed using the statistical software SPSS version 26.0. The meanstandard deviations for numeric data were recorded, while categorical variables were expressed as numbers and percentages. The chi-square test was used to compare qualitative factors between groups. The level of significance was set at 0.05 p-value.

RESULTS

The study population had maximum patients in age group of 26-30 (44%) years. [Table 1]

The gestational age was 29-32 weeks in 28.0%, 33-36 weeks in 52.0%, and 37-40 weeks in 20.0% of the women. There were 48.0% primigravida, 40.0% second-4thgravida, and 12.0% women with more than four pregnancies. [Table 2]

Mild thrombocytopenia was identified in 3 (12.0%), Moderate in 13 (52.0%), and Severe in 9 (36.0%) women. Gestational thrombocytopenia was identified in 12 (48.0%), Obstetrical thrombocytopenia in 7 (28.0%), and Medical thrombocytopenia in 6 (24.0%) women. [Table 3]

The mean Hb was 10.331.82, the PT was 16.881.88, the APTT was 33.449.98, and the INR was 1.160.14. [Table 4]

30(40.0%) women underwent emergency LSCS, whereas 45 (60.0%) had NVD. There were 24 (32.0%) low birth weight babies.There was no morbidity among 13 (52.0%) women, but there was massive haemorrhage among two (8.0%), puerperal sepsis among two (8.0%), ARF (renal failure) among three (12.0%), pulmonary edoema among three (12.0%), and DIC among two (8.0%). [Table 5]

Table 1: Demographic profile of thrombocytopenic women

Age (years)	Frequency	Percentage
19-25	12	16 %
26-30	33	44%
31-35	21	28%

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36-40	9	12%
Socioeconomical status		
Middle	31	41.33%
Low	44	58.67%

Table 2: Obstetric profile of thrombocytopenic women

		Frequency	Percent
Gestational age (weeks)	29-32	21	28.0%
	33-36	39	52.0%
	37-40	15	20.0%
Parity	Primigravida	36	48.0%
	2nd-4thgravid	30	40.0%
	>4th gravid	9	12.0%

Table 3: Severity and Etiology of thrombocytopenia

		Frequency	Percent
Severity of Thrombocytopenia	Mild (100,000-150,000)	9	12.0%
	Moderate (50,000-99,000)	39	52.0%
	Severe (<50,000)	27	36.0%
Etiology of Thrombocytopenia	Gestational	36	48.0%
	Obstetrics	21	28.0%
	Medical	18	24.0%

Table 4: Coagulation profile of thrombocytopenic women

	Minimum	Maximum	Mean	Std. Deviation
Hb(gm/dl)	6.20	12.90	10.33	1.82
PT(sec)	14.00	20.00	16.88	1.88
APTT(sec)	20.00	62.00	33.44	9.98
INR	1.00	1.40	1.16	0.14

Table 5: Fetomaternal outcome among women with thrombocytopenia

Maternal outcome		Frequency	Percent
Mode of delivery LSCS		30	40.0%
Vaginal delivery		45	60.0%
Baby birth weight Normal		51	68.0%
Low		24	32.0%
No maternal morbidity		39	52.0%
Maternal Morbidity	Massive haemorrhage	6	8.0%
	Puerperal sepsis	6	8.0%
	ARF (renal failure)	9	12.0%
	Pulmonary edema	9	12.0%
	DIC	6	8.0%

DISCUSSION

Although the majority of cases of thrombocytopenia in pregnancy do not lead to severe outcomes, the underlying pathology may occasionally be life threatening, thus once thrombocytopenia in pregnancy is detected, the woman should undergo additional clinical and laboratory assessment to discover the reason. Timely diagnosis and adequate maternal and foetal care require careful examination of the start of thrombocytopenia and clinical symptoms.[11,12]

Pregnancy-related thrombocytopenia, also known as gestational thrombocytopenia, accounts for 70%-80% of occurrences.[13,14] It occurs between the mid-second and third trimesters of pregnancy, and its pathophysiology is unknown. It has been proposed that it is caused by a variety of processes, including hemodilution and rapid clearance.[15]

There are no confirmatory laboratory tests available, hence the diagnosis is based on exclusion. Thrombocytopenia tends to be mild to moderate, with platelet counts of 130-150 x 109/L in roughly two-thirds of cases.[16,17]

Platelet count had no effect on mode of delivery. In this present study, LSCS was performed on 40.0% of the women and vaginal delivery was performed on 60.0% of the women. Similar to our findings, Singh et al,[5] discovered that 48% of patients were delivered with LSCS and 52% via vaginal birth. LSCS was performed due to obstetric and medical problems such as previous LSCS, foetal distress, failed induction, and so on.

Sumathy et al discovered that LSCS was performed on 89 patients (48.9%), with 59 cases having spontaneous vaginal delivery (32.4%), 26 cases having induced vaginal delivery (14.2%), 6 having forceps delivery (3.2%), and 2 having hysterotomy (1.0%). According to Sibai,[19] the rate of caesarean section with HELLP syndrome is significant, especially when the pregnancy is shorter than 34 weeks (68%). The caesarean section rate in pregnancies fewer than 30 weeks is 87.0%.[18]

In our study, the majority of women (52.0%) had a gestational age of 33-36 weeks. According to

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Pandey et al,[19] the most occurrences of thrombocytopenia (41%) were observed during 30-34 weeks of gestation, followed by 20% cases between 35-39 weeks of gestation.

This was consistent with Crowther et al's findings that gestational thrombocytopenia occurs largely in the late second or third trimester of pregnancy. This is in contrast to the study conducted by Parnas et al, in which the majority of cases (74.4%) were in the gestational age range of 37-40 weeks.[20]

The most common cause of thrombocytopenia in our study (48.0%) was gestational thrombocytopenia. In a study conducted by Vyas et al in Ahmadabad, the most common aetiology (44.6%) was gestational thrombocytopenia.[21] In another study, Parnas et al discovered that the most common causes of thrombocytopenia were gestational thrombocytopenia (59.3%), immune thrombocytopenic purpura (ITP) (11.05%), preeclampsia (10.05%), and HELLP syndrome (12.06%).[22]

In a study conducted in Bangalore by Mamatha S et al, 46.6% of cases were related to gestational thrombocytopenia, 46.6% to HELLP and preeclampsia, and 2 instances were due to AFLP. Approximately 60% of patients presented in the third trimester, followed by 40% in the second trimester.[23]

Another study conducted by Salnlo et al at Helsinki University Central Hospital in Finland found that the majority of cases (81%) of maternal thrombocytopenia at term were caused by gestational thrombocytopenia.[24] This study found that gestational thrombocytopenia is the most prevalent cause of thrombocytopenia in pregnancy, followed by hypertensive disease of pregnancy (36.5%).

In another study, Nisha S et al,[25] found that gestational thrombocytopenia was seen in 64.2% of the women, followed by thrombocytopenia related to hypertensive disorders of pregnancy. The conclusions of this investigation were compatible with the findings of our study.

To be consistent with gestational thrombocytopenia, women should have no previous history of thrombocytopenia (except during a previous pregnancy), the thrombocytopenia should have resolved spontaneously within 1-2 months of delivery, and the fetus/newborn baby should not have had thrombocytopenia. In the current study, 12.0% of women had mild thrombocytopenia, 52.0% had moderate thrombocytopenia, and 36.0% had severe thrombocytopenia.

Singh et al,[5] discovered that 40% of the cases had severe thrombocytopenia, with 10% of the newborns having severe thrombocytopenia. Gestational thrombocytopenia has no negative effects on mother or foetal outcomes. The findings of this investigation were comparable to those of Kamphuis et al,[26] Samuels examined 162 pregnant mothers and their newborns with thrombocytopenia, including 74 with suspected GT. There was no child from a GT pregnancy with a platelet count of 50,000/L or cerebral haemorrhage.[27] In Burrows' study, 756 of 1027 thrombocytopenic women (73.6%) had GT. Only one infant had a platelet count of 50,000/L, and he had trisomy 21 and congenital bone marrow dysfunction. He concluded that GT is the most common type of thrombocytopenia and provides no obvious hazards to either the mother or the child.[16]

In a research by Katke RD et al, 70.9% of patients had moderate thrombocytopenia, whereas 29.1% had severe thrombocytopenia.[28] This disparity could be attributed to the huge number of patients included in their study, as well as the exclusion of patients with mild thrombocytopenia from their study.

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In our study, 48.0% of the women were primigravida, 40.0% were second to fourth gravida, and 12.0% were more than fourth gravida. Katke RD et al, revealed that 35% of cases were primipara, 32% were gravida 2, 33% were gravida 3 to 5, and Brohi et al discovered that the parity status of was multigravida 53.5%, primigravida 40.8% and grand multipara 5.6%.[29]

All cases of thrombocytopenia necessitate early discovery and treatment based on the diagnosis. Babies should also be tested for neonatal thrombocytopenia. It is thought that the risk of neonatal thrombocytopenia in babies born to moms with gestational thrombocytopenia is minimal.

According to our findings, the most common maternal morbidities reported were ARF (renal failure) and pulmonary oedema among 12.0% of women, followed by major haemorrhage and puerperal sepsis among 8.0% and DIC among 8.0% of women. According to Singh et al,[5] 8.88% of cases experienced significant bleeding, 6.66% had puerperal sepsis, 5.55% had renal failure, 7.78% developed DIC, 10% developed pulmonary edoema, and 2.2% underwent obstetrical hysterectomy. According to Sumathy et al,[18] Atonic PPH occurred in 7.1% of cases, abruption in 2.7%, eclampsia in 2.1%, DIC in 2.1%, ARDS in 0.5%, and incisional site leaking in 0.5%. Sibai et al,[30] conducted a retrospective cohort analysis in which 38% of pregnant women with HELLP had DIC (13%). Audibert et al reported 1.5% cerebral haemorrhage.[31]

CONCLUSION

Gestational thrombocytopenia is by far the most prevalent cause of thrombocytopenia during pregnancy and poses no harm to either the foetus or

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the mother. Because most instances are asymptomatic, thrombocytopenia should be checked by routinely examining the platelet count and peripheral smear in early pregnancy and also in the third trimester to enable early diagnosis.

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