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PREVALENCE OF THROMBOCYTOPENIA INN PREGNANT WOMEN FROM 34-38 WEEKS DESCRIPTIVE OBSERVATIONAL STUDY

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ABSTRACT

Background: Thrombocytopenia is the medical term used to describe a platelet count below 1.5 lakh/cumm. Following anaemia, this illness is the second most prevalent hematological condition during pregnancy. It impacts around 6 to 15%, with an average of 10%, of all pregnancies. Gestational thrombocytopenia is a relatively harmless disease characterized by low platelet count that typically occurs during the later stages of pregnancy. It resolves automatically upon childbirth.

Methods: This is a one-year hospital-based prospective observational research. The study included all pregnant women who visited the outpatient department (OPD) at the obstetrics and gynecology department of a tertiary care center for antenatal checkup. A blood sample was collected from each participant.

Results: Among the total number of patients included in the study, 45 women were diagnosed with thrombocytopenia, while the remaining individuals had a normal platelet count. The prevalence of thrombocytopenia was 34%. The majority of instances of thrombocytopenia in pregnancy (50%) were attributed to gestational thrombocytopenia, followed by hypertensive diseases (22.4%). Subsequently, ITP accounted for 11.11% of cases, while dengue accounted for 5.5%.

Conclusions: Gestational thrombocytopenia is the primary cause of thrombocytopenia in pregnancy, accounting for 50% of cases. However, it is important to further explore other potential underlying reasons. An extensive medical history and comprehensive physical examination will effectively exclude the majority of potential reasons.

Keywords: *Gestational thrombocytopenia, Hemolysis elevated liver enzymes and low platelets, Massive hemorrhage, Puerperal sepsis, Renal failure, Thrombocytopenia in pregnancy*

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INTRODUCTION

Platelets, which are non-nucleated cellular fragments derived from megakaryocytes, are crucial for hemostasis[1]. Thrombocytopenia was observed to occur in 7% to 8% of pregnancies in India[2]. Platelets primarily serve to initiate hemostasis, meaning that a deficiency in platelets, known as thrombocytopenia, can lead to uncontrolled bleeding from any area of the body. It can be linked to significant bleeding after childbirth and may necessitate immediate medical attention for both the mother and the newborn.[3]

Thrombocytopenia is a condition characterized by a platelet count below 150 x 109/l, which occurs due to either increased platelet lysis or ineffective generation. The typical range for platelet count is 150-400*109/l. During pregnancy, the platelet count drops by around 6%-7% in the third trimester due to haemodilution. The absolute platelet count remains within the normal range in the majority of cases [4-9]. Mild thrombocytopenia is defined as a platelet count ranging from 100 to 150x 109/l, while moderate thrombocytopenia is characterized by a platelet count between 50 and 100 x 109/l. Severe thrombocytopenia, on the other hand, is indicated by a platelet count below 50 x 109/l.1The cause of thrombocytopenia The causes are limited to pregnancy-related conditions, including Gestational Thrombocytopenia (GT) and hypertensive illnesses such as preeclampsia, eclampsia, HELLP syndrome, and acute fatty liver of pregnancy. Additional factors contributing to this condition include Disseminated Intravascular Coagulation (DIC), Immune Thrombocytopenic Purpura (ITP), thrombotic thrombocytopenic purpura, haemolytic uremic syndrome, viral infections, drug consumption, autoimmune disorders, vitamin B12 or folate deficiency, aplastic anaemia, and myelophthisis. Pseudo thrombocytopenia can occur due to platelet clumping generated by EDTA. In such cases, it is recommended to test a new sample using citrate as an anticoagulant[1, 10].

METHODS

It is a hospital based discriptive observational study over a period of 1 year. All pregnant women who attended OPD at the department of obstetrics and gynecology of tertiary care hospital, for antenatal checkup were included for the study and blood sample was withdrawn. Platelet count was performed using manual method and automated hematology method. Total number of cases studied are 45, selected according to platelet count at admission.

Inclusion criteria

- All pregnant women were included in the study
- Pregnancy with a previous history of ITP.

Exclusion criteria

- Pregnant or non- pregnant women having diabetes or thrombo-embolic disorders were excluded from the study.

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It is a prospective observational study conducted over a period of 1 year. All pregnant women who attended OPD in department of obstetrics and gynecology were included in the study. Out of these 45 cases were studied in detail.

Details were entered in the proforma regarding the detailed history of period of gestation, high risk factors, past history, complications- during present and past pregnancy. History of petechiae, bruising, drug usage, viral infection, thrombocytopenia in previous pregnancy was taken. General, systemic and obstetric examination was done. All women were subjected to blood test for Hb, TLC, DLC, bleeding time, clotting time, RFT, LFT, HBsAg and HIV. Women with fever were tested for Dengue IgM. Coagulation tests (PT, APTT, FDP and fibrinogen) were done in those with signs or symptoms of DIC. Blood specimen were withdrawn with minimal stasis from the ante-cubital vein using a dry sterile disposable syringe and needle. 3 mm of blood is taken into EDTA tubes. The specimens were labelled properly. The samples were kept at room temperature until processed within 4 hours of collection.

Laboratory analysis

Platelet count was performed using manual method and automated haematology method.

Presenting complaints were noted, the cases followed up for any changes in platelet count and associated complaints. Any complications during delivery, maternal and fetal outcome were noted. Maternal outcome regarding mode of delivery, postpartum period was observed. Fetal outcome regarding birth weight, NICU admission, early neonatal outcome noted and were followed up for any complications.

RESULTS

Among the 132 instances included in the study, 45 women were diagnosed with thrombocytopenia, whereas 87 had a normal platelet count. The prevalence of thrombocytopenia was 34%.

Table 1: Demographic and obstetrical profile.

Parameters		No. of cases	%
Gestational age (weeks)	34	15	32.22%
	35-36	21	46.66%
	37-38	9	21.11%
Severity of thrombocytopenia	Mild	16	35.55%
	Moderate	11	24.44%
	Severe	18	40%
Parity of patients	Primigravidae	19	41.11%
	2^{nd} -4^{th} gravid	24	53.33%
	>4^{th} gravid	3	5.55%

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Table 1 presents the demographic and obstetrical characteristics. Analysis of the data showed that 21women (46.66%) had a gestational age between 33 and 36 weeks, 15 women (32.22%) had a gestational age between 29 and 32 weeks, and 9 women (21.11%) had a gestational age between 37 and 40 weeks.

Table 2: Etiology of thrombocytopenia in pregnancy.

Causes	No. of cases	%
Gestational	23	50%
Obstetrics	11	25.56%
(a) Hypertensive disorders	10	22.44%
Preeclampsia	9	18.89%
Eclampsia	1	3.3%
(b) DIC	1	3.3%
Medical	11	24.44%
(a) Hypersplenism	1	2.22%
(b) Hepatic diseases	1	3.33%
(c) Dengue	2	5.55%
(d) Megaloblastic anaemia	1	2.22%
(e) ITP	5	11.11%

Out of the total number of cases, 40% (18 instances) experienced severe thrombocytopenia. Among women, 24.44% (11 women) had moderate thrombocytopenia, while 35.55% (16 women) had mild thrombocytopenia. Regarding the distribution of pregnancies, 18 women (41.11%) were primigravidae, 24 instances (53.33%) fell into the category of gravidae 2nd to 4th, and 5 cases (5.55%) had a gravidae more than 4th. According to Table 2, gestational thrombocytopenia was the most common cause of thrombocytopenia in pregnancy, accounting for 50% of cases, followed by hypertensive diseases at 22.4%. Subsequently, ITP accounted for 11.11% of cases, while dengue accounted for 5.5%.

Additional factors contributing to the condition included disseminated intravascular coagulation (DIC) at a rate of 3.3%, hypersplenism at a rate of 2.2%, hepatic illness at a rate of 3.3%, and megaloblastic anemia at a rate of 2.2%.

Table 3: Maternal and fetal outcome.

Outcome		Cause	No. of cases	%
Maternal	No morbidity	Nil	26	57.78%
	Morbidity	Massive haemorrhage	4	8.88%
		Puerperal sepsis	3	6.66%
		ARF (renal failure)	2	5.55%
		DIC	4	7.78%
		Pulmonary edema	5	10%
		Obstetrical hysterectomy	1	2.22%

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Perinatal	No morbidity	Nil	24	54.44%
	Morbidity	FGR	5	11.11%
		Birth asphyxia	5	10%
		Severe thrombocytopenia	5	10%
		ICH	2	4.44%
	Mortality	IUD	2	4.44%
		Still birth	2	5.55%

Table 3 presents the maternal and fetal outcomes, with the majority of patients (57.78%) experiencing no morbidity. Among the cases of maternal morbidity in this study, 4 (8.88%) experienced severe hemorrhage, 3 (6.66%) had puerperal sepsis, 2 (5.55%) suffered from renal failure, 4 (7.78%) developed DIC, 5 (10%) experienced pulmonary edema, and 1 (2.2%) required obstetrical hysterectomy.

Out of the total number of cases in this study, 24 patients, which accounts for 54.4%, did not experience any perinatal morbidity. The study identified several perinatal morbidities, including fetal growth restriction in 5 instances (11.11%), birth hypoxia in 5 cases (10%), and severe complications. Thrombocytopenia occurred in 5 cases, accounting for 10% of the total. Intracranial hemorrhage was observed in 2 cases, representing 4.4% of the total. Stillbirth occurred in 2 cases, accounting for 5.5% of the total. There were four instances where an intrauterine device (IUD) was used, accounting for 4.4% of the cases. In this study, 60% of the cases were delivered via cesarean section (LSCS) and 40% of the cases were delivered vaginally.

DISCUSSION

The current investigation revealed a prevalence rate of thrombocytopenia at 18.0%. The identified causes of thrombocytopenia during pregnancy include gestational thrombocytopenia (GT), immune thrombocytopenic purpura (ITP), pre-eclampsia and accompanying consequences such as HELLP syndrome, dengue fever, systemic lupus erythematosus (SLE), and drug-induced thrombocytopenia. The bulk of cases (50%) were attributed to gestational thrombocytopenia (GT), followed by hypertensive disorders of pregnancy (22.4%), and then ITP (11.1%). Additional contributing factors included dengue, hepatic illness, and megaloblastic anemia. The incidence of Gestational thrombocytopenia was 11.8%.

The incidence of thrombocytopenia in many previous research ranges from 6 to 12%. The prevalence of the condition was initially found to be approximately 7.6% in investigations conducted by Burrows RF and Kelton JG2. Shehata N et al conducted a prospective study with a substantial sample size to examine several causes of thrombocytopenia during pregnancy.[11]The study revealed that the occurrence of GT among those with thrombocytopenia was 73.6%, whereas the prevalence of preeclampsia/eclampsia/HELLP was 21%. Immune diseases of pregnancy constituted 4.1% of the cases, whilst other causes

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such as DIC/TTP accounted for 1.3% of the cases. In their study, Boehlen F et al examined thrombocytopenia and found that the prevalence was reported as 11% and 6-11% respectively. They also identified GT as the most frequent cause[12,13]. The study conducted by Sanio S et al. revealed a prevalence rate of 7.3% [14]. According to Karim R et al, thrombocytopenia was found in 7% to 10% of pregnancies.[15] Mc Crae KR et al's study indicates that thrombocytopenia impacts approximately 6-10% of pregnant women. The prevalence of thrombocytopenia in pregnancy was reported by Singh N et al to be 8.8%.[16] cases of gestational thrombocytopenia (GT) were seen, accounting for 64.2% of the total cases. Obstetric causes were identified in 22.1% of the cases, while medical causes were recognized in 13.68% of the cases. The most prevalent obstetric causes of thrombocytopenia were hypertensive and hepatic diseases. Parnas M et al identified the primary etiologies of thrombocytopenia as gestational thrombocytopenia (59.3%), immune thrombocytopenia (11.05%), preeclampsia (10.05%), and HELLP syndrome (12.06%). According to Khellaf M et al, thrombocytopenia is a common condition during pregnancy, affecting around 10% of pregnant women. Among the various causes of thrombocytopenia in pregnancy, GT is the most prevalent.[17]

Ozkan H et al conducted a review of 29 women with ITP and reported that most of the deliveries were vaginal. Additionally, none of the newborns experienced any difficulties that might be attributed to the method of delivery. A prospective study conducted by Burrows RF and Kelton JG et al, for a duration of 1 year, focused on a cohort of women who gave birth at McMaster University. The study findings indicate that gestational thrombocytopenia does not have any detrimental consequences on the health of both the mothers and their newborns.[18] Furthermore, it is not warranted to perform obstetrical interventions like as cesarean section because to thrombocytopenia in these mothers. A study conducted by Ruggeri M et al included 37 consecutive patients diagnosed with GT, with a total of 41 pregnancies recorded. Out of a total of 41 deliveries, 33 (80%) were conducted through vaginal delivery, whereas 8 (20%) required a caesarean section due to obstetric reasons. Two individuals underwent blood transfusion for postpartum hemorrhage (atonic). No cases of neonatal hemorrhage were observed during any of the deliveries. Webert KE et al conducted a retrospective examination of obstetric patients diagnosed with ITP. A total of 92 women diagnosed with ITP were included in the study. 31.1% of women in 37 pregnancies needed medical intervention to raise their platelet levels. The majority of deliveries (82.4%) were vaginal, and the occurrence of blood during delivery was infrequent. Out of the total number of newborns, 18 of them, which accounts for 14.6%, needed medical intervention for hemostatic impairment. Additionally, there were two cases of fetal fatalities documented. One was caused by bleeding. In pregnancy, immune thrombocytopenia (ITP) poses a minimal danger, nevertheless, treatment may be necessary for both mothers and infants to increase their platelet levels. A retrospective investigation was conducted by Suri V et al, focusing on 16 individuals diagnosed with ITP. There were no instances of postpartum hemorrhage or maternal mortality. All neonates, regardless of the method of delivery, did not experience any bleeding issues. The researchers determined that pregnant patients with ITP generally had positive maternal and perinatal outcomes. Singh N et al. found that thrombocytopenia did not

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influence the mode of delivery.[16]Maternal morbidity and mortality were observed solely in cases of thrombocytopenia caused by medical and obstetric factors.

The current study shown that pregnant women with thrombocytopenia had a heightened risk of preterm delivery (less than 37 weeks) at a rate of 78.88%. This increased risk can be attributed to the greater necessity for labor induction in response to obstetrical problems.

Thrombocytopenia is both a source of problems and a complication of other illnesses. The most prevalent complications are pulmonary edema, occurring in 10% of cases, and maternal hemorrhage, occurring in 8.88% of cases. The study found that out of the total cases, 38 (42.23%) experienced complications, such as puerperal sepsis (6.66%), acute renal failure (5.55%), disseminated intravascular coagulation (7.78%), and obstetrical hysterectomy (2.2%). A study conducted by Amita D. indicates that... The prevalence of postpartum hemorrhage (PPH) was 9.89% among the cases. Postpartum hemorrhage (PPH) occurred in 30% of medical cases, 15% of obstetric cases, and only 4.92% of cases of pregnant thrombocytopenia. The occurrence rate was substantially greater in cases of medical thrombocytopenia (p=0.008). During the study, there were three cases of obstetric thrombocytopenia and two cases of medical thrombocytopenia that resulted in death, resulting in a mortality rate of 5.26%. These patients had a significantly greater mortality rate (p=0.009) compared to GT, which had no mortality.

Perinatal morbidity was seen in 41 patients, accounting for 45.56% of the research population. The perinatal problems seen in this study include fetal growth restriction in 10 patients (11.1%), birth asphyxia in 9 patients (10%), severe thrombocytopenia in 9 patients (10%), and intracranial hemorrhage (ICH) in 4 instances (4.4%). Within this study, a total of 9 patients experienced perinatal mortality. Among these cases, 4 patients had intrauterine death (IUD) and 5 patients had stillbirth. Neonatal problems do not have a direct correlation with the maternal platelet count. Fetal problems arise in instances of premature birth, placental abruption, thrombocytopenia coupled with anemia, and sepsis.

A study conducted by Singh N found that platelet count testing could be performed in 81.4% of the 91 infants. All individuals had platelet counts within the normal range at birth, except for the one born to a mother with immune thrombocytopenic purpura (ITP). The neonate's platelet count, which was initially 65,000 per cubic millimeter on the first day, rebounded to the normal range by the eighth day. There were no instances of bleeding problems among the infants.

Within this study, 40% of the cases exhibited severe thrombocytopenia, whereas 10% of the infants experienced severe thrombocytopenia. Gestational thrombocytopenia has no negative impact on the health and well-being of both the mother and the fetus. The study findings were consistent with the study conducted by Kamphuis et al.[19] Samuels assessed a total of 162 pregnant women and their newborns who had thrombocytopenia, with 74 of them having suspected GT. None of the infants born to a GT gravida had a platelet count below 50,000/µL

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or experienced cerebral hemorrhage.[20] Out of the 1027 women included in Burrows' study, 756 of them, or 73.6%, who had thrombocytopenia, also had GT. There was just one infant who had a platelet count below 50,000/µL, and this infant had both trisomy 21 and congenital bone marrow malfunction. He determined that GT is the most common form of thrombocytopenia and does not seem to present any hazards for either the mother or the newborn.[21]

In Burrows' investigation on women suffering from thrombocytopenia, a total of 216 individuals experienced preeclampsia with HELLP syndrome, and 5 of them delivered infants with severe thrombocytopenia. All of these births occurred prematurely. Two out of five infants suffered from cerebral hemorrhages.[21] In his analysis of the study on ITP in pregnant patients, Cook observed that 6 out of 32 newborns experienced severe thrombocytopenia.[22] During a 6-year period at McMaster University, Burrows conducted a study involving a significant number of maternal platelet counts (15,607 samples). The study revealed that out of the 46 women diagnosed with ITP, 4 newborns experienced severe thrombocytopenia. Three of these were delivered through the birth canal, while one was delivered via caesarean section. There were no cases of cerebral bleeding in infants.[21] Payne conducted a comprehensive analysis of 55 infants delivered by 41 women with ITP over a period of 10 years. Two cases were accompanied by problems - one involved fetal bradycardia, while the other had an umbilical cord hematoma leading to fetal distress, resulting in anoxic encephalopathy and cerebral palsy in the infant.[23]

Based on this study, there were 15 deliveries that occurred between 29 to 32 weeks, 21 deliveries that occurred between 33 to 36 weeks, and 9 deliveries that occurred at full term. Platelet count did not have an impact on the mode of delivery. 48% of the cases were delivered via cesarean section (LSCS), while 52% of the cases were delivered vaginally. Lower segment cesarean section (LSCS) was performed to address obstetric and medical issues such as a history of previous LSCS, fetal distress, and unsuccessful induction, among others. A study conducted in Kolkata reported a total of 91 patients delivered throughout the study period. 68.1% of the deliveries occurred at term, whereas 31.9% occurred preterm. 61.54% of the women gave birth vaginally without any complications, 36.26% underwent a cesarean section, and 2.2% required instrumental assistance during delivery. All the cesarean sections were conducted due to obstetric or medical reasons, with none being operated specifically for thrombocytopenia.

CONCLUSION

Gestational thrombocytopenia is the predominant etiology of thrombocytopenia in pregnancy, accounting for 50% of cases. However, it is important to further explore other potential underlying reasons. Performing a comprehensive history and physical examination will effectively eliminate the majority of potential causes. Examine the remaining sample of CBC and perform a smear test to eliminate the possibility of pancytopenia and platelet clumping, which are commonly linked with pseudo thrombocytopenia.

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If there is no previous occurrence of thrombocytopenia and the platelet count is more than 70,000/mcL, the condition is more likely to be Glanzmann thrombasthenia (GT). If the number of platelets drops below 50,000/mcL or if there is a previous history of thrombocytopenia, the likelihood of the illness being ITP is higher.

Thrombocytopenia is positively correlated with negative outcomes for both the fetus and the mother. Hence, regularly examine the platelet count. Thorough prenatal care and hospital deliveries allow obstetricians to detect thrombocytopenia and related complications at an early stage. Prompt intervention leads to improved outcomes. Additional research is necessary to identify individuals at high risk of developing thrombocytopenia in order to establish an efficient screening and management program.

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