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Original Research Article

A study on thrombocytopenia in pregnancy and feto-maternal outcome conducted at tertiary care center Rajkot, Gujarat

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ABSTRACT

Background: Thrombocytopenia is second only to anemia as the most common hematological abnormality encountered in pregnancy. Better antenatal care has led to increased detection. Once diagnosed, it is Important to further evaluate and to determine the cause to optimize management. The objectives were to study feto-maternal outcome in patient of thrombocytopenia in terms of maternal and neonatal complications and to study the causes of thrombocytopenia in pregnancy.
Methods: The present study was a hospital-based study carried out from June 2021 to June 2022 at the department of obstetrics and gynecology, PDU medical college, Rajkot, Gujarat. During this period 100 patients in the third trimester of pregnancy with thrombocytopenia were selected randomly.
Results: In this study 41% cases were mild thrombocytopenia, 39% with moderate and 20% were severe cases. 50% cases were gestational thrombocytopenia, 31% were cases associated with hypertensive disorders of pregnancy, 8% cases were associated with abruption, 13% cases were associated with IUFD, 2% cases were idiopathic thrombocytopenic purpura (ITP), 8% cases were associated with viral (dengue) and bacterial (malaria) infection, 1% cases were associated with SLE, 1% cases was thrombotic thrombocytopenic purpura (TTP). Maternal complications were encountered in form of DIC in 13% cases, jaundice in 7% of cases, 2% cases were complicated by PPH, 4% cases were complicated by acute kidney injury, 2% cases were associated with sickle cell crisis and 4% cases were maternal mortality. 12% were stillbirth and 5% cases had neonatal mortality.
Conclusions: Thrombocytopenia in pregnancy induced hypertension carries a risk for both the mother and her fetus. Thrombocytopenia in pregnancy if timely diagnosed do not cause any mortality, however management of these patients require a multidisciplinary approach and close collaboration between obstetrician, physician, and neonatologist.

Keywords: DIC, Gestational thrombocytopenia, HELLP syndrome, ITP, PPH, TTP

INTRODUCTION

Thrombocytopenia is a common occurrence in pregnancy and affects 7 to 10% of all pregnancies.[1] It is the second most common hematological finding in pregnancy next to anemia. Pregnancy is associated with numerous physiological and pathological changes in platelet number and its functions and which can be of clinical concern. Inherited qualitative and quantitative platelet disorders may also manifest during pregnancy with the risk of bleeding.[2]

The normal platelet count in non-pregnant women is 1.5 lakh to 4 lakh/ml.[1,3] In uncomplicated pregnancies, recent studies shows that the platelet count decreases by an average of 10% during the third trimester as a result of hemodilution or accelerated destruction leading to younger and larger platelets. Incidental thrombocytopenia in pregnancy is usually benign. The mean platelet volume increases, suggesting that a compensated state of progressive platelet destruction occurs during the third trimester.[4]

In the pregnant women, thrombocytopenia is defined as a platelet count of less than 1.5 lakh per ml. Mild thrombocytopenia: 1 to1.5 lakh per ml, moderate thrombocytopenia: 0.5 to 1 lakh per ml and severe thrombocytopenia: <50,000 per ml.[5] Thrombocytopenia results mainly from four processes are deficient platelet production, accelerated destruction, hemodilution and artifactual thrombocytopenia.

The gestational thrombocytopenia is most common etiology, which accounts for almost three fourths of all cases (70-80%).[6] Thrombocytopenia complicating hypertensive disorders of pregnancy are responsible for approximately 21% of all cases of thrombocytopenia during pregnancy.[2,7]

The platelet count is a valuable rapid screening test in assessing acute obstetric hemostatic failure, particularly in helping the attendants together with other assessments to diagnose the presence and severity of disease. The decreased platelet count may be related to hemodilution and/or accelerated platelet turnover with increased platelet production in the bone marrow, and increased trapping or destruction at the placenta. Platelet had role in primary hemostasis.[8-10] In patients suspected of a disorder of hemostasis, defects in platelet number or function, impaired coagulation or abnormalities in vascular Function should be considered.[11]

Thrombocytopenia occurs in 50% of patients with preeclampsia and occasionally precedes other manifestations of the disease.[2] The thrombocytopenia is usually moderate and clinical hemorrhage is uncommon unless the patient develops disseminated intravascular coagulopathy. We studied different causes of thrombocytopenia in pregnancy and its complications. It is the most common immunologically mediated thrombocytopenic condition during pregnancy.[12] Drug-Induced thrombocytopenia occurs in the pregnant as well as the non-Pregnant setting an updated list of offending drugs is maintained.[13] Approximately 25% of patients with systemic lupus erythematosus (SLE) develop thrombocytopenia secondary to platelet destruction due to antiplatelet antibodies, circulating immune complexes or other causes.[14] The most common hemostatic defect in obstetric disorders is thrombocytopenia, occurring in 17% of eclamptic patients.[15] Fetal outcome was studied by APGAR score and NICU admission.

Objectives

To study the maternal and neonatal outcome and to study causes of thrombocytopenia in pregnancy and the management of moderate to severe cases of thrombocytopenia.

METHODS

The present study was a hospital-based study carried out from June 2021 to June 2022 at the department of obstetrics and gynecology, PDU medical college, Rajkot, Gujarat. During this period 100 patients in third trimester of pregnancy with thrombocytopenia were selected randomly after satisfying inclusion and exclusion criteria. Ethical clearance was obtained for this study from the institution. It is a prospective observational study.

A detailed history and examination were done. History about the patient's age, obstetric history, gestational age, menstrual history, obstetric history, associated complications in present pregnancy were noted, fetal heart sounds recorded. All required investigation like hemogram, blood grouping, Rh typing, coagulation profile, serology, urine routine and microscopy, liver function test including enzymes, renal function test and ultrasound, per abdomen, per vaginum examination done. Complete blood count was done as routine investigation to all the patients who are admitted as in patients, from it platelet count is obtained. Platelet count less than 1.5 lakh were further evaluated in this study to know the causes and to render optimal treatment for better maternal and perinatal outcome. Decision of delivery by vaginal route or cesarean delivery was done as when required.

A pre designed study proforma was filled for each case. Cases were then studied for the maternal and perinatal outcome. The outcome of the baby was studied by birth weight, APGAR score, NICU admission or perinatal mortality.

Inclusion criteria

All the cases of thrombocytopenia in third trimester, admitted in obstetrics and gynecology department during study period and pregnant women with platelet count <1.5 lakh were included.

Exclusion criteria

Pregnancy with malignancy having thrombocytopenia or due to treatment with cancer chemotherapy and thrombocytopenia treated with blood products.

RESULTS

The present study consists of 100 patients of thrombocytopenia which are evaluated for their outcomes. Out of 85% of the cases were in age group between 21 to 30 years, 10% ≤20 and 5% above 30 years of age. The average age was 23.25 years. The youngest patient was 19 years old and oldest patient was 37 years old.

Of 100 cases 75% cases were of un-booked nature while 25% cases were booked.

In this study at time of presentation, 60% cases were having gestational age 38 to 40 weeks, 22% were of 34 to 37 weeks, 15% were less than 34 weeks and 3% were more than 40 weeks (Table 1).

Table 1: Gestational age distribution.

Gestational age (in weeks)	No. of cases
<34 weeks	15%
34 to 37 weeks	22%
38 to 40 weeks	60%
>40 weeks	3%

In this study 41% of cases were mild thrombocytopenia, 39% cases were moderate thrombocytopenia and 20% were severe thrombocytopenia.

Total 32% cases were associated with hypertensive disorders, 7% cases were abruptio placenta, 13% cases were IUFD, 20% cases were associated with moderate to severe anemia, 14% cases were associated with oligohydroamnios, 4% cases were IUGR, 4% cases were multiple gestation, 8% cases were previous LSCS, 3% cases were hypothyroidism and 33% cases were not associated with any above factors.

Table 2: Etiology of thrombocytopenia.

Etiology	No. of cases
Gestational	50%
Hypertensive	31%
Abruptio	8%
IUFD	13%
Viral + Bacteria	8%
ITP + TTP	3%
SLE	1%

Total 50% out of 100 cases were gestational thrombocytopenia, 31% were cases associated with hypertensive disorders of pregnancy, 8% cases were associated with abruption, 13% cases were associated with IUFD, 2% cases were Idiopathic thrombocytopenic purpura (ITP), 8% cases were associated with viral and bacterial infection, 1% cases were associated with SLE, 1% cases was thrombotic thrombocytopenic purpura (TTP) (Table 2).

Total 32% cases out of 100 cases were associated with hypertensive disorders of pregnancy. Among the hypertensive disorders 50% cases were associated with Preeclampsia, 21% cases were associated with eclampsia, 12.5% cases were associated with severe preeclampsia, 9% cases associated with HEELP syndrome, 3% case associated with imminent eclampsia and 3% case associated with chronic hypertension with superimposed preeclampsia.

Majority, 54% of the cases had spontaneous vaginal delivery, 33% were underwent LSCS, 12% were underwent induced vaginal delivery, in 1% case instrumental vaginal delivery.

Total 19 out of 100 cases were complicated by one or other way. 68% cases complicated by DIC, 10% cases were complicated by PPH, 21% cases were complicated by acute kidney injury, 37% cases were complicated with jaundice, 10% cases were associated with sickle cell crisis. There were maternal deaths in 4 out of 100 cases (Table 3).

Table 3: Maternal complications.

Maternal Complications	No. of cases
DIC	13
PPH	2
AKI	4
Jaundice	7
Sickle cell crisis	2
Death	4

Total 13 out 105 were stillbirth. 88% of neonates had APGAR score between 7 to 10, 7.6% had between 4 to 6 and 4.4% had APGAR score of 1 to 3.

Total 38 out of 105 births were NICU admission, 18% babies admitted for LBW, 18% babies admitted for VLBW, 21% babies for RDS, 5% for TTN, 13% for HBsAg positive mother, 2% for jaundice, 2% for cardiac anomaly and 13% babies dead after admission.

Table 4: Thrombocytopenia and maternal outcome of labour.

Thrombocytopenia	Vaginal delivery	LSCS	Total
Mild	29	13	42
Moderate	27	12	39
Severe	11	8	19
Total	67	33	100

Of the 42% of mild thrombocytopenia patients, out of these 69 % delivered by vaginally and 31% by caesarean section. 39% of moderate thrombocytopenia, out of these 69% delivered by vaginally and 31% by caesarean section. 19% cases were severe thrombocytopenia, out of these 58% delivered by vaginally and 42% by caesarean section (Table 4).

Table 5: Thrombocytopenia and NICU admission.

NICU admission	Yes	No	Total	Stillbirth
Mild thrombocytopenia	19	21	42	2
Moderate thrombocytopenia	20	15	35	7
Severe thrombocytopenia	5	10	15	4

Out of 42% cases were mild thrombocytopenia, 43% needed for NICU admission, 48% didn't need NICU admission and 9% were stillbirth. 40% cases were moderate thrombocytopenia, 48% needed for NICU admission, 36% didn't need NICU admission and 16%

were stillbirth. 18% cases were severe thrombocytopenia, 26% needed for NICU admission, 53% didn't need NICU admission and 21% were stillbirth (Table 5).

Table 6: Thrombocytopenia versus maternal and neonatal death.

Thrombocytopenia	Maternal death	Neonatal death	Stillbirth
Mild	1	2	2
Moderate	2	3	7
Severe	1	0	4

Out of 100 cases, 5 cases were having mild thrombocytopenia, out of these 1 (20%) case associated with maternal death, 2 (40%) cases associated with neonatal death and 2 (40%) were stillbirth. 12 cases were having moderate thrombocytopenia, out of these 2 (17%) case associated with maternal death, 3 (25%) cases associated with neonatal death and 7 (58%) were stillbirth. 5 cases associated with severe thrombocytopenia, out of these 1 (20%) case associated with maternal death and 4 (80%) were stillbirth (Table 6).

DISCUSSION

Age

In my study the average age was 23.25 years, 49% cases belong to age group of 21 to 25 years. Thrombocytopenia in pregnancy nearing term by Harde et al the average age was 25.27 years.[16]

In Nisha et al study 50% cases belong to age group of 21 to 25 years.

In Genovers et al study the average age was 30 years.[17]

Gravidity

In our study 41% cases were primigravida, 59% were multigravida.

Asrie et al conducted a study in Ethiopia in 2014 which reported 35% of study group were primigravida and 65% were multigravida.

In Nisha et al study 34% were primigravida, 64% were multigravida.[8]

Causes of thrombocytopenia

In this study most common cause of thrombocytopenia was gestational thrombocytopenia i.e., 50% out of 100 cases. Second one was hypertensive disorders of pregnancy i.e., 31% and other causes includes abruption in 8% cases, IUFD in 13% cases, idiopathic thrombocytopenic purpura (ITP) in 2% cases, viral and bacterial infection in 8% cases, SLE in 1% case, thrombotic thrombocytopenic purpura (TTP) in 1% case. Nisha et al study reported, 64.2% had gestational thrombocytopenia, 22.1% had hypertensive disorders, 5% had ITP, 2% had bacterial origin.[8]

In a study conducted by Wang et al in 2016, the incidence of gestational thrombocytopenia was 60%, hypertensive disorders were 28.2% and other causes including ITP making 11.8%.[18]

Study conducted by Sainio et al in 2001, gestational thrombocytopenia was 81%, preeclampsia was 16% and ITP was 3%.[3]

In a study conducted by Parnas et al, found that the main causes of thrombocytopenia were gestational thrombocytopenia (59.3%), immune thrombocytopenic purpura (11.05%), preeclampsia (10.05%), and HELLP syndrome (12.06%).[4]

In study conducted by Vanaja et al at Gandhi medical college Secunderabad in 2017, gestational thrombocytopenia included 64%, hypertensive disorders making 21% and other disorders making 13%.[19]

In a study of prevalence of thrombocytopenia during pregnancy & its effect on pregnancy and neonatal outcome by Arora et al at Guru Gobind Singh Medical College, Faridkot, Punjab in 2016, the commonest etiology was gestational thrombocytopenia (61%).[5]

Thrombocytopenia in pregnancy nearing term by Harde et al, surprisingly most common cause was hypertensive disorders includes 33.3%, gestational thrombocytopenia being the second cause includes 28%, 12.7% includes bacterial and viral causes, 3.3% had ITP.[16]

Severity of thrombocytopenia

In our study, Mild thrombocytopenia was noted in 41% of the total cases, moderate thrombocytopenia in 39% and severe thrombocytopenia in 20%. In Nisha et al study 74.7% had mild thrombocytopenia, 17.9% were having moderate thrombocytopenia and 7.4% were having severe thrombocytopenia.[8]

In a prospective observational study done in the department of obstetrics and gynecology, VMMC and Safdarjung Hospital in New Delhi, India, 62% were having mild thrombocytopenia, 31% were in moderate thrombocytopenia group, and 7% were with severe thrombocytopenia. There was a more incidence of severe thrombocytopenia in our study when compared to this study.[6] In a study conducted by Khatke et al in Mumbai at Sir JJ group of hospitals in 2014, 70.9% were with moderate thrombocytopenia and 29.1% were with severe thrombocytopenia.[21] In a study conducted in Ethiopia Gondar university by Asrie et al in 2014, 74% were with mild thrombocytopenia, 20.7% were having moderate, and 5.3% were with severe thrombocytopenia.[20]

Mode of delivery

In present study 54% of the cases had spontaneous vaginal delivery, 33% were underwent LSCS, 12% were underwent induced vaginal delivery, in 1% case instrumental vaginal delivery.

In a study at VMMC and Safdarjung Hospital in New Delhi, India it has been found that around 94% patients delivered vaginally; among these, 9 patients had instrumental delivery.

Study conducted by Nisha et al, normal deliveries were in 61.54% and cesarean section done in 32.26% patients.[8] Thrombocytopenia in pregnancy nearing term by Harde et al 54.7% patients delivered vaginally, and 45.3% by cesarean section.[16]

Maternal complications

Maternal complications were encountered in form of DIC in 13% cases, jaundice in 7% of cases, 2% cases were complicated by PPH, 4% cases were complicated by acute kidney injury, 2% cases were associated with sickle cell crisis and maternal death in 4% cases.

In a study of prevalence of thrombocytopenia during pregnancy and its effect on pregnancy and neonatal outcome by Arora et al at Guru Gobind Singh Medical College, Faridkot, in 2016 found placental abruption in 6.6%, PPH in 4.3%.[5]

In Sibai et al study maternal mortality was 1.1%, acute renal failure was reported in 7.4% of patients.[7]

Nisha et al study observed higher incidence of PPH (9.89%), 5.33% of maternal mortality.[8]

NICU admission

In our study 41% neonates required NICU admission. Study conducted by Nisha et al reported 21% babies had NICU admission.[8] The study on thrombocytopenia in pregnancy by Harde et al reported 10% babies required NICU admission.[16]

Neonatal complications

Among 18% babies admitted for LBW, 18% babies admitted for VLBW, 21% babies for RDS, 5% for TTN, 13% for HBsAg positive mother, 2% for jaundice, 2% for cardiac anomaly and 13% babies dead after admission, 12% were stillbirth and 5% cases had neonatal mortality.

In a study of prevalence of thrombocytopenia during pregnancy and its effect on pregnancy and neonatal outcome by Arora, et al at Guru Gobind Singh Medical College, Faridkot, in 2016 showed stillbirth in 8%, low birth weight in 10.21%, low APGAR in 16.2% babies.[5]

Study by Nisha et al reported that 13% had stillbirth.[8]

Limitation is that there is a need of more studies to convey conclusion of study, need more follow up in neonates.

CONCLUSION

Thrombocytopenia is being detected more often during routine investigation like complete blood count. The most common cause of thrombocytopenia being gestational thrombocytopenia and next being hypertensive disorders complicating pregnancy. Thrombocytopenia in pregnancy induced hypertension carries a risk for both the mother and her foetus. The associated causes like abruption, intrauterine fetal death, disseminated intravascular coagulation aggravates the complication for thrombocytopenia. Mild thrombocytopenia was more common in third trimester and more often gestational thrombocytopenia. Despite thrombocytopenia in pregnancy, NICU admission was infrequent. Thrombocytopenia in pregnancy if timely diagnosed do not cause any mortality, however management of these patients require a multidisciplinary approach and close collaboration between obstetrician, physician, and neonatologist.

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