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Research Article

Thrombocytopenia during pregnancy: an institutional based study

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ABSTRACT

Background: Thrombocytopenia affects 6% to 10% of all pregnant women and other than anemia is the most common hematologic disorder in pregnancy. All pregnant women with platelet counts less than 100000/mm³ require careful hematological and obstetric consultation to exclude more serious disorders. Objectives of the study were to study the number and percentage of cases, the various etiological factors associated, the effect and outcome of the mother and neonates borne.

Methods: The study was conducted in this tertiary institute over a period of two years and three months. 103 pregnant patients with a platelet count of or less than 100000/mL were included. The course of pregnancy was studied and the investigation profile was monitored.

Results: Out of 103 cases of thrombocytopenia, 73 (70.9%) patients had moderate, 30 (29.1%) patients had severe thrombocytopenia. In this study 35% cases were primigravidas, 32% cases were gravida 2, 33% cases were gravida 3 to 5. Gestational thrombocytopenia was the most common etiological factor with 30.1% cases, 27.2% cases due to hypertensive disorders, 18.4% cases due to malaria followed by 12.6% cases due to dengue. In the study group the mean gestational age was 33 ± 5.139, maximum cases belonged to gestational age 30 to ≥40. 14 patients (14.1%) had still births. 9 patients (8.7%) had Neonatal deaths (NNDs).

Conclusions: The challenge to the clinician is to weigh the risks of maternal and fetal bleeding complications against the benefits of diagnostic tests and interventions.

Keywords: Thrombocytopenia, Pregnancy

INTRODUCTION

Pregnancy is associated with physiological and pathological changes in platelet numbers and function which can be of clinical concern. Inherited defects in platelet function and number may also manifest during pregnancy with the risk of bleeding dependent on the underlying problem. Thrombocytopenia affects 6% to 10% of all pregnant women and other than anemia is the most common hematologic disorder in pregnancy.

Recent studies have demonstrated that the mean and 2.5th percentile platelet count decreases by approximately 10% in pregnant patients, and that the histogram of platelet

count distribution at term is normally distributed but shifted to the left.^{1,2} In most cases, this “physiologic” decrease in platelets occurs in the third trimester. Thrombocytopenia in pregnancy may occur secondary to a variety of causes ranging from benign disorders such as gestational thrombocytopenia to syndromes associated with significant morbidity such as eclampsia, HELLP, ITP, TTP-HUS. Other causes of thrombocytopenia in pregnancy are rare such as Type II von Willebrand Disease (vWD), and disseminated intravascular coagulation. All pregnant women with platelet counts less than 100000/mL require careful hematological and obstetric consultation to exclude more serious disorders.

Aims and objectives of the study

1. To study the number and percentage of cases of moderate and severe thrombocytopenia in pregnancy.
2. To study the various etiological factors associated with thrombocytopenia in pregnancy.
3. To study the different diseases in which thrombocytopenia manifests in ANC patients.
4. To study the effect and outcome of the mother and neonates borne to them.
5. To study the management of cases of thrombocytopenia in pregnancy.
6. To study the morbidity and mortality associated with thrombocytopenia in pregnancy.

METHODS

Inclusion criteria: All pregnant patients with a platelet count equal to or below 100000 per micro-litre were included in the study.

The study was conducted in the tertiary institute over a period of two years and three months, from September 2010 to November 2012. 103 pregnant patients with a platelet count of or less than 100000/mL were included in the study group. Patients from all trimesters of pregnancy were included. On admission a thorough history was taken and a detailed clinical examination was carried out. All the patients were subjected to biochemical investigations, special investigations and ultrasonography.

Patients were grouped into 2 categories - one with moderate thrombocytopenia (platelet count >50000 or less than or equal to 100000/ml and one with severe thrombocytopenia (platelet count equal to or less than 50000/ml).

The course of pregnancy was studied and the investigation profile was monitored. The obstetric outcome was noted. The entire hospital stay course was noted. Final outcome of all cases and complications if any was statistically studied.

RESULTS

Out of the 103 cases, 30 cases (29.1%) had severe thrombocytopenia and 73 cases (70.9%) had moderate thrombocytopenia (Table 1).

Table 1: Distribution of moderate and severe thrombocytopenia cases.

Platelets (50000 cut-off)	No.	Percentage
Severe TCP (\leq 50000)	30	29.1%
Moderate TCP ($>$ 50000)	73	70.9%
Total	103	100.0%

In this study 34% cases were of 20-23 weeks of gestation, 31.1% cases were of 24-27 weeks of gestation, 18.4%

cases were of 20-23 weeks of gestation, 8.7% cases were of 32-35 weeks of gestation, 4.9% cases were of less than 20 weeks of gestation, 2.9% cases were of \geq 36 weeks of gestation (Table 2).

In this study 35% cases were primigravidas, 32% cases were gravida 2, 33% cases were gravida 3 to 5.

Table 2: Distribution of cases according to weeks of gestation.

Weeks of gestation	No.	Percentage
<20	6	5.8%
20 to 24	10	9.7%
25 to 29	9	8.7%
30 to 34	28	27.2%
35 to 39	46	44.7%
\geq 40	4	3.9%
Total	103	100.0%

Table 3: Distribution of cases according to etiology.

Etiology	No.	Percentage
Gestational thrombocytopenia	31	30.1%
Malaria	19	18.4%
Dengue	13	12.6%
Pregnancy induced hypertension	13	12.6%
Eclampsia	9	8.7%
HELLP (Syndrome of haemolysis, elevated liver enzymes, low platelets)	6	5.8%
Antepartum haemorrhage	4	3.9%
Renal disease	2	1.9%
Acute respiratory distress syndrome	1	1.0%
Idiopathic thrombocytopenic purpura	1	1.0%
Leptospirosis	1	1.0%
Multiorgan failure	1	1.0%
Septicaemia	1	1.0%
Stroke	1	1.0%
Total	103	100.0%

In this study gestational thrombocytopenia was the most common etiological factor with 30.1% cases followed by 18.4% for malaria followed by 12.6% for dengue, 12.6% for pregnancy induced hypertension, 8.7% for eclampsia, 5.8% cases for HELLP syndrome.

37.9% cases of severe thrombocytopenia had deranged liver function tests and 6.8% cases of moderate thrombocytopenia had deranged liver function tests. The association of deranged LFTs with severe thrombocytopenia was statistically significant (Pearson Chi square $P = 0.000099$). In this study 8.8% cases had deranged renal function tests. 91.2% cases had renal function tests within normal limit.

24.1% cases of severe thrombocytopenia and 2.7% cases of moderate thrombocytopenia had deranged RFTs. The

association of deranged RFTs with severe thrombocytopenia was statistically significant (Pearson Chi square P = 0.00059).

In this study out of the malaria cases, 73.88% cases had P. vivax Malaria, 15.78% cases had mixed malaria and 10.5% cases had P. falciparum malaria.

Among the 12 cases of dengue in this study, 50% were IgM positive, 42.8% were NS1Ag positive, 7.2% cases were IgG positive.

Table 4: Route of delivery among the cases.

Route of delivery	No.	Percentage
Full term vaginal delivery with episiotomy	25	24.27%
Full term vaginal delivery without episiotomy	25	24.27%
Lower segment caesarean section	25	24.27%
Preterm vaginal delivery	22	21.35%
Spontaneous abortion	4	3.88%
Lower segment caesarean section with obstetric hysterectomy	1	0.97%
Lower segment caesarean section with obstetric hysterectomy with internal iliac ligation	1	0.97%
Total	103	100.0%

The route of delivery of the 102 cases was full term vaginal delivery with episiotomy in 24.27% cases, full term vaginal delivery without episiotomy in 24.27% cases, LSCS in 24.27% cases, preterm vaginal delivery in 21.35% cases, 3.88% spontaneous abortions.

1 case required LSCS with obstetric hysterectomy and one case required LSCS with obstetric hysterectomy with internal iliac ligation.

In this study 7.1% cases had fresh still births and 7.1% cases had macerated still births. In this study among the severe thrombocytopenia cases 24.6% had still births and among the moderate thrombocytopenia cases 8.6% had still births.

The association of still births with severe thrombocytopenia was statistically significant (Pearson Chi square test P = 0.01347).

In this study out of 103 cases there were 9 (8.7%) neonatal deaths. In the severe thrombocytopenia group there were 20% neonatal and in the moderate thrombocytopenia group there were 4.1% neonatal deaths. The association between NNDs and severe thrombocytopenia was statistically significant (Pearson Chi square test P = 0.0095).

Table 5: Observations of cases of neonatal deaths.

	Number of cases
Total neonatal deaths	9
Weeks of gestation	
≤29 weeks	2
30-34 weeks	3
≥35 weeks	4
Etiology of cases	
Eclampsia	3
HELLP	2
APH	3
GT	3
Malaria	1
TCP category	
Moderate	3
Severe	6
Route of delivery	
Vaginal	9
Caesarean	0
APGAR score	
1 min ≤7	5
5 min ≤7	5
Cause of NND	
Birth asphyxia	3
Pneumonia	1
Cardio respiratory arrest	5

Table 6: Analysis of platelet transfusions.

No. of cases requiring platelet transfusion (All cases)	36
Mean ± SD	4.78 ± 3.296
Median	4
Minimum	2
Maximum	20

In this study the number of mortalities were seen were 8 (7.76% of cases). 5 cases belonged to the severe thrombocytopenia group. The association of mortality with severe thrombocytopenia was statistically significant. The cause for mortality in these 6 cases were one each due to acute respiratory distress syndrome, haemothorax with liver failure, intracranial bleed, cardiorespiratory arrest, hypotension? Pulmonary embolism, kidney failure, multiorgan failure, stroke.

DISCUSSION

In a prospective study of over 27 months all pregnant patients with thrombocytopenia with platelet count less than or equal to one lakh per mL were included .Their detailed history, examination findings, investigations were noted. Course of pregnancy was followed up and the maternal, obstetric and fetal outcome was noted.

The study included 103 cases of thrombocytopenia with platelet count less than or equal to one lakh, who were admitted in our tertiary public hospital were included in the study group.

Out of 103 cases of thrombocytopenia, 73 (70.9%) patients had moderate (platelet count >50000), 30 (29.1%) patients had severe thrombocytopenia (platelet count ≤ 50000).

In this study 35% cases were primigravidas, 32% cases were gravida 2, 33% cases were gravida 3 to 5.

Maximum incidence of cases being in 20 to 27 years age group with mean age 27.57 ± 5.64 years in the study group as opposed to a study by Parnas et al. in 2006³ the mean age was 30.7 ± 5.9 .

Gestational thrombocytopenia was the most common etiological factor with 30.1% cases followed by 27.2% for hypertensive disorders including HELLP syndrome followed by 18.4% for Malaria followed by 12.6% for dengue. The most important etiological factors for thrombocytopenia are gestational thrombocytopenia accounting for 59.3% followed by hypertensive disorders 21.1% followed by ITP 11.05% as studied by M. Parnas et al. in 2006.³

In the study group the mean gestational age was 33 ± 5.139 , maximum cases belonged to gestational age 30 to ≥ 40 weeks as compared to the study of Parnas et al. in 2006³ in which maximum patients 74.4% belonged to 37 to 40+ weeks gestation.

Out of 103 patients, 19 patients had malaria. In this study out of the malaria cases, 73.88% cases had *P. vivax* Malaria, 15.78% cases had mixed malaria and 10.5% cases had *P. falciparum* malaria. Out of 4 mixed infection cases, 3 (75%) belonged to the severe thrombocytopenia group. Severe thrombocytopenia was seen in 2 out of 14 cases of *P. vivax* and 1 out of 2 cases of *P. falciparum*.

14 patients (13.5%) had Dengue, out of which 7 (50%) cases were IgM positive, 1 (7.2%) was IgG positive, 6 cases (42.8%) were NS1Ag. 2 out of 7 cases of IgM positive, 2 out of 6 cases of NS1Ag positive belonged to severe thrombocytopenia group.

The route of delivery of the 103 cases was full term vaginal delivery with episiotomy in 24.27% cases, full term vaginal delivery without episiotomy in 24.5% cases, LSCS in 24.27% cases, preterm vaginal delivery in 21.35% cases, 3.88% spontaneous abortions. 1 case required LSCS with obstetric hysterectomy and one case required LSCS with Obstetric Hysterectomy with internal iliac ligation.

11 patients (10.9%) had preterm deliveries out of which 3 patients (27.27%) belonged to the severe thrombocytopenia group. The association of preterm

deliveries with severe thrombocytopenia was not statistically significant.

3 patients (3%) had spontaneous abortion and underwent check curettage and all patients belonged to the non-severe thrombocytopenia group

14 patients (14.1%) had still births as opposed to the study of Parnas et al. in 2006³ where 6.5% cases had still births. Out of that 8 patients (57.14%) belonged to the severe thrombocytopenia group. 6 patients (42.85%) belonged to non-severe thrombocytopenia group. The association of still births with severe thrombocytopenia was statistically significant. (Pearson Chi square test $P = 0.01347$).

There were 7 fresh still births out of which 1 occurred at <29 weeks of gestation, 4 occurred at 30-34 weeks of gestation and 2 at 35-39 weeks of gestation. 3 cases had moderate thrombocytopenia and 4 had severe thrombocytopenia. 3 cases occurred in eclampsia patients, 1 case in HELLP syndrome patient, one in ARDS patient, one in a patient of septicaemia.

There were 7 macerated still births out of which 6 occurred at 35-39 weeks gestation and one at 30-34 weeks gestation. 4 cases had severe thrombocytopenia and 3 cases had moderate thrombocytopenia, 2 occurred in patients of PIH, one in a patient of HELLP syndrome and 3 in patients of APH.

27 patients (26.47%) underwent a caesarean section due to obstetric indications as opposed to the study of Parnas et al. in 2006³ in which 36.2% patients underwent a caesarean section, out of which 19 patients (70.37%) belonged to non-severe thrombocytopenia group and 8 patients (29.62%) belonged to the severe thrombocytopenia group. The association of LSCS with severe thrombocytopenia was not statistically significant.

9 patients (8.7%) had neonatal deaths (NNDs) as opposed to the study of Parnas et al. in 2006³ in which 2.5% patients has NNDs. Out of that 6 patients (66.66%) belonged to the severe thrombocytopenia group. The association of NNDs with severe thrombocytopenia was statistically significant (Pearson Chi square test $P = 0.0095$). 5 NNDs occurred due to cardiorespiratory arrest, 3 due to birth asphyxia and one due to pneumonia. 5 neonates had APGAR score of <7 at 1 minutes as well as 5 minutes. 2 occurred in patients at <29 weeks of gestation, 4 in patients >35 weeks of gestation and 3 in patients at 3-34 weeks of gestation. 3 NNDs occurred in Gestational thrombocytopenia patients, one in a malaria patient, 2 in patients with HELLP syndrome and 3 in patients with eclampsia.

In this study the number of mortalities were seen were 8 (7.76% of cases). 5 cases belonged to the severe thrombocytopenia group. The association of mortality with severe thrombocytopenia was statistically significant. The cause for mortality in these 6 cases were

one each due to acute respiratory distress syndrome, haemothorax with liver failure, intracranial bleed, cardiorespiratory arrest, hypotension? Pulmonary embolism, kidney failure, multiorgan failure, stroke.

In this study oligohydramnios was seen in 5.8% of cases as opposed to the study of Parnas et al. in 2006³ where it was seen in 1.5% of cases. In this study 4.8% cases had placenta previa as opposed to the study of Parnas et al in 2006³ where 2.5% cases had placenta previa.

CONCLUSION

Thrombocytopenia affects 6% to 10% of all pregnant women and other than anemia is the most common hematologic disorder in pregnancy.

Thrombocytopenia in pregnancy may occur secondary to a variety of causes ranging from benign disorders to syndromes associated with significant morbidity. Other causes of thrombocytopenia in pregnancy are rare such as type II von Willebrand Disease (vWD), and disseminated intravascular coagulation. Most of these occur during specific periods of gestation, although these periods may sometimes overlap. On occasion, patients may present with a constellation of symptoms that reflect characteristics of more than one disorder. While some of these are not associated with adverse pregnancy outcomes, others are associated with substantial maternal and/or neonatal morbidity and mortality.

The challenge to the clinician is to weigh the risks of maternal and fetal bleeding complications against the benefits of diagnostic tests and interventions.

An accurate diagnosis and risk assessment in the antenatal period are essential for developing specific plans for any antenatal interventions and for management of delivery and the postpartum periods, and the neonate.

Management of pregnant women with platelet disorders requires a multidisciplinary approach and close

collaboration between the obstetric and haematology teams. Also in developing countries like India, diseases like Malaria and Dengue which are uncommon in other parts of the world, add to the morbidity of the condition and prove to be challenging and pose a management dilemma.

In this modern era of component therapy and advances in the field of blood and blood products has helped to manage the respective deficiency of blood components in the cases. So blood and blood products transfusion especially platelet transfusion has proved to be a boon to the patients of pregnancy associated thrombocytopenia.

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Ethical approval: The study was approved by the institutional ethics committee

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