

# A Study of Maternal and Fetal Outcome of Thrombocytopenia in Pregnancy

Abhijeet Madhukar Patil<sup>1</sup>, Shreedha Uday Prasade<sup>2</sup>, Manasi Harish Kathaley<sup>3</sup> and Poonal Patil<sup>4\*</sup>

<sup>1</sup>Associate Professor, Department of Obstetrics and Gynaecology, Dr. Vasant Rao Pawar Medical College Hospital and Research Centre, Nashik – 422003, Maharashtra, India; drabhip17@gmail.com

<sup>2</sup>Former PG Resident, Department of Obstetrics and Gynaecology, Dr. Vasant Rao Pawar Medical College Hospital and Research Centre, Nashik – 422003, Maharashtra, India

<sup>3</sup>Professor and Head, Department of Obstetrics and Gynaecology, Dr. Vasant Rao Pawar Medical College Hospital and Research Centre, Nashik – 422003, Maharashtra, India

<sup>4</sup>Assistant Professor, Department of Obstetrics and Gynaecology, Dr. Vasant Rao Pawar Medical College Hospital and Research Centre, Nashik – 422003, Maharashtra, India

## Abstract

**Background:** Thrombocytopenia is found to complicate pregnancies in India. The major function of platelets is the initiation of haemostasis. Thrombocytopenia can result in spontaneous bleeding from any part of the body. It may be associated with serious bleeding at delivery and may require emergent maternal and neonatal care. **Introduction:** After anaemia, thrombocytopenia is the most frequently occurring hematologic disorder in pregnancy. It is found to complicate 7% to 8% of pregnancies in India. The major function of platelets is the initiation of haemostasis, and hence, thrombocytopenia can result in spontaneous bleeding from any part of the body. It may be associated with serious bleeding at delivery and may require emergent maternal and neonatal care. Thrombocytopenia is diagnosed if the platelet count  $150 \times 10^9/l$ , caused by increased platelet lysis or reduced inefficient production. **Aims & Objectives:** To study the maternal and fetal outcome of thrombocytopenia in pregnancy and to study some of the causes of thrombocytopenia in pregnancy. **Methodology:** Total 113 cases with maternal thrombocytopenia were included in present study after satisfying inclusion and exclusion criteria and followed till delivery. We studied maternal complications gestational age at delivery, indication of induction of labour and method (if required) and mode of delivery, NICU stay were recorded. **Results:** Majority of the patients i.e. 63 patients (55.8%) were in the age group of 20-25 years. Among 113 cases; primigravida (56 cases, 49.6%) and multigravida (57 cases, 50.4%) were almost equally distributed. Majority of the study population was diagnosed with Gestational thrombocytopenia 50.4% followed by severe pre-eclampsia 22.12%, HELLP syndrome 8.8%, abruption 5.3% antepartum eclampsia and dengue 2.7% each. Maternal mortality was seen in 2 cases (1.8%). Mean birth weight was found to be 2.45 Kgs. of 113 babies, neonatal mortality was seen in 15 cases, NICU admission was indicated in 18 babies and KMC care was needed for 1 baby. **Conclusion:** The most common cause of thrombocytopenia during pregnancy is Gestational Thrombocytopenia (GT) followed by pre-eclampsia, eclampsia and HELLP syndrome. With platelet counts above  $70,000/\mu L$  no prior history of thrombocytopenia the condition is more likely to be GT. The lack of well-defined symptomatology and clinical presentation makes early and accurate diagnosis difficult leading to delay in treatment.

**Keywords:** Gestational Thrombocytopenia, HELLP Syndrome, Pre-Eclampsia

## 1. Introduction

The non-nucleated cellular fragments of megakaryocytes

are coined as platelets and play a pivotal role in hemostasis<sup>1</sup>. Thrombocytopenia was found to complicate 7% to 8% of pregnancies in India<sup>2</sup>. The major function

\*Author for correspondence

of platelets is the initiation of haemostasis, and hence, thrombocytopenia can result in spontaneous bleeding from any part of the body. It may be associated with serious bleeding at delivery and may require emergent maternal and neonatal care<sup>3</sup>.

Thrombocytopenia is a platelet count of less than  $150 \times 10^9/l$ , as result of by increased platelet lysis or reduced inefficient production. The normal range of platelet count is  $150-400 \times 10^9/l$ . As a result of haemodilution of pregnancy platelet count decreases apparently by 6%-7% in the 3rd trimester. The absolute platelet count stays in the normal range in most<sup>4-9</sup>. Mild thrombocytopenia is a platelet count of  $100-150 \times 10^9/l$ , moderate at  $50-100 \times 10^9/l$ , and severe thrombocytopenia is less than  $50 \times 10^9/l$ .<sup>1</sup>

#### Etiology of Thrombocytopenia

The causes can be restricted to pregnancy, such as Gestational Thrombocytopenia (GT) and hypertensive disorders (preeclampsia; eclampsia; HELLP syndrome; and acute fatty liver of pregnancy). Other causes are Disseminated Intravascular Coagulation (DIC), Immune Thrombocytopenic Purpura (ITP), thrombotic thrombocytopenic purpura, haemolytic uremic syndrome, viral infections, consumption of drugs autoimmune disorders, vitamin B12 or folate deficiency, aplastic anaemia, and myelophthisis.

Pseudo thrombocytopenia can result from EDTA induced clumping of platelets, in which case, a new sample should be analyzed using citrate as an anticoagulant<sup>1,10</sup>.

## 2. Aims and Objectives

1. To study maternal outcome in patients of thrombocytopenia in pregnancy.
2. To study fetal outcome in patients of thrombocytopenia in pregnancy.
3. To study causes for thrombocytopenia in pregnancy.

## 3. Materials and Methods

The study was Prospective Observational Study conducted in the Department of Obstetrics and Gynaecology of Dr. Vasantrao Pawar Medical College Hospital and Research Centre, Nashik, Maharashtra. After ruling out exclusion criteria a total 113 patients were selected.

**Duration of Study:** August 2018 to December 2020.

**Inclusion criteria:** All pregnant (Primigravida or multigravida) women attending the antenatal clinic, both outpatient and inpatients, beyond 28 weeks of gestation with platelet counts lesser than  $150 \times 10^9/l$ .

**Exclusion criteria:** Participants were excluded if they had:

- Chronic liver disease
- History Of Idiopathic Thrombocytopenic Purpura
- Patients on warfarin or any anti-coagulant therapy

All participants had platelet count done at enrolment.

A complete history including menstrual, obstetric history was taken. A through clinical was done. All the cases had regular ante-natal checkups till delivery. Additional investigations were done when indicated.

#### Statistical Analysis

The recorded data was in (Microsoft Excel 2010) and then with SPSS version 20 (SPSS Inc., Chicago, Illinois, USA).

Descriptive statistics were calculated. The level of confidence interval and p-value were set at 95% and 5% respectively.

## 4. Results

Our study included 113 patients with thrombocytopenia between 1<sup>st</sup> August 2018 to 31<sup>st</sup> December 2020.

The average age of the study participants was 25.07 years (Table 1). A big chunk of participants belonged to the age group of 20-25 years (63 cases, 55.8%).

The average gestation age of the study participants was 37.01 weeks (Table 2). Majority of them were found above 37 weeks of gestation (58 cases, 51.35).

Majority of them were found above 37 weeks of gestation (58 cases, 51.35) followed by 34-37 weeks (36 cases, 31.9%) and <34 weeks (19 cases, 16.8%).

Among 113 cases primigravida (56 cases, 49.6%) and multigravida (57 cases, 50.4%) were almost equally distributed (Table 3).

Majority of the study population was diagnosed with Gestational thrombocytopenia 50.4% followed by severe pre-eclampsia 22.12%, HELLP syndrome 8.8%, abruption 5.3%, Ante-partum eclampsia and Dengue 2.7% each (Chart 1).

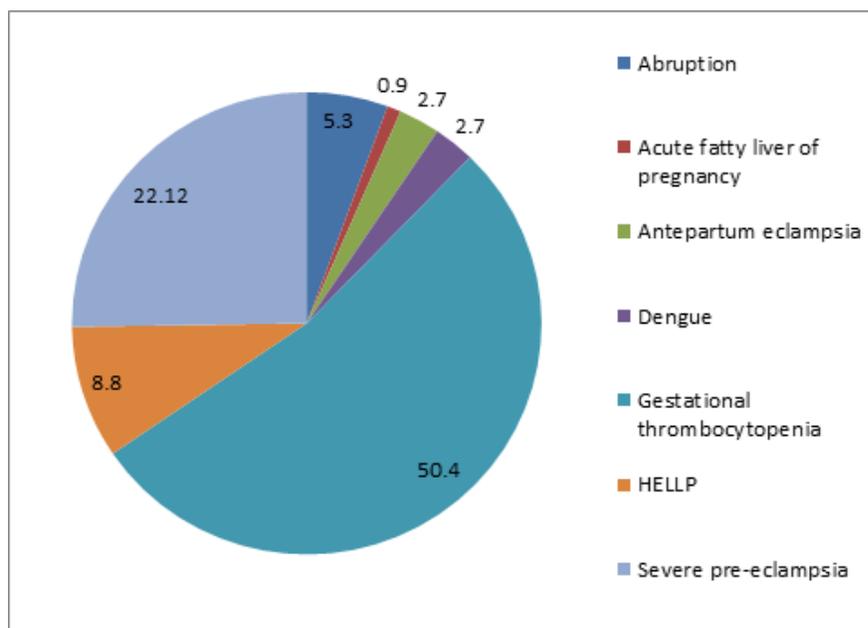
Majority (54 cases, 47.8%) delivered normally followed by LSCS (39 cases, 34.5%), Induced Preterm Vaginal Delivery (PTVD) (14 cases, 12.4%), Spontaneous Preterm Vaginal Delivery (4 cases, 3.5%), Induced Full

**Table 1.** Age distribution of the study population

Age (Years)	Frequency	Percent
<20	8	7.1
20-25	63	55.8
26-30	32	28.3
31-35	9	8.0
>35	1	0.9
<b>Total</b>	<b>113</b>	<b>100.0</b>
<b>Mean ± SD</b>	25.07±3.86	

**Table 2.** Gestational age of the study population

Gestational age (weeks)	Frequency	Percent
<34	19	16.8
34-37	36	31.9
>37	58	51.3
<b>Total</b>	<b>113</b>	<b>100.0</b>
<b>Mean ± SD</b>	37.01 ± 2.65	



**Chart 1.** Causes of thrombocytopenia among the study population.

**Table 3.** Parity distribution of the study population

Parity	Frequency	Percent
Primigravida	56	49.6
Multigravida	57	50.4
<b>Total</b>	<b>113</b>	<b>100.0</b>

**Table 4.** Mode of delivery in the study population

Mode of Delivery	Frequency	Percent
LSCS	39	34.5
FTND	54	47.8
Induced PTVD	14	12.4
Induced FTVD	1	0.9
Spontaneous PTVD	4	3.5
Ventouse delivery	1	0.9
<b>Total</b>	<b>113</b>	<b>100.0</b>

**Table 5.** Indications for LSCS in the study population

Indications	Frequency (N = 39)	Percentage
Abruption	2	5.1
Antepartum eclampsia	1	2.6
Breech presentation	1	2.6
Central placenta previa	1	2.6
CPD	12	30.8
Foetal distress	7	17.9
HELLP	2	5.1
Oligohydramnios with IUGR	2	5.1
Prev hysterotomy with abruption	1	2.6
Prev LSCS	8	20.5
Twin gestation in labour	2	5.1
<b>Total</b>	<b>39</b>	<b>100.0</b>

**Table 6.** Fetal outcome in the study population

Baby outcome	Frequency	Percent
Fresh Still Birth	6	5.3
Kangaroo Mother care required	1	0.9
In NICU i/v/o respiratory distress	10	8.7
In NICU i/v/o prematurity	5	4.3
In NICU i/v/o preterm LBW	3	2.6
IUFD	9	7.9
No special care required	81	71.7

Term Vaginal Delivery (FTVD) and Ventouse delivery (1 case each) (Table 4).

Major indication for LSCS in the study population was CPD (12 cases 30.8%) followed by previous LSCS (8 cases, 20.5%), fatal distress (7 cases, 17.9%), Less common indications were HELLP syndrome alone, twin gestation, Oligohydramnios with IUGR and abruption (Table 5).

Out of a total of 113 babies' mortality was observed in 15 cases (6 cases showed Fresh Still Birth (FSB) and 9 cases showed Intra-Uterine Death (IUD)). 18 cases required NICU admission (due to respiratory distress, pre-maturity or Low Birth Weight (LBW)) and 1 case needed kangaroo mother care (Table 6).

Mean birth weight of the babies was  $2.45 \pm 0.66$  Kgs.

Among mothers, mortality was observed in 2 cases seen; 1 due to HELLP with PPH and DIC whereas the other was due to Dengue shock syndrome.

## 5. Discussion

The study was conducted in the Department of Obstetrics and Gynaecology at a tertiary healthcare centre. A total of 113 women with diagnosis of thrombocytopenia in pregnancy, >28 weeks were recruited for the study. They were treated according to institutional protocol and were followed up till delivery. Maternal and foetal outcome in this regard was studied.

Asrie *et al.* (2017)<sup>11</sup> in their study in 2014 reported 35% were primigravida and 65% were multigravida. 30-35 years was the most commonest age group. In our study, 49.67% primigravida and 50.4% multigravida were observed. Primigravida in our study outnumbered those in Asrie *et al.* (2017)<sup>11</sup> and majority of the cases fell under 25-30 years (55.8%) in our study.

### 5.1 Maternal Outcome

In the present study, majority (54 cases, 47.8%) delivered normally followed by LSCS (39 cases, 34.5%), Induced PTVD (14 cases, 12.4%), spontaneous PTVD (4 cases, 3.5%), Induced Vaginal delivery and Ventouse delivery (1 case each). Zutshi *et al.* (2019)<sup>12</sup> found that 94% subjects had vaginal deliveries, out of which 9 were instrumental delivery. In our study 56.4% had vaginal deliveries which are lower when compared Zutshi *et al.* (2019)<sup>12</sup>. ACOG recommends that termination of pregnancy is the treatment of choice in maternal thrombocytopenia in PIH with or without HELLP syndrome.

### 5.2 Fetal Outcome

Our study had a total 113 cases 15 cases (6 cases showed fresh still birth and 9 cases showed intrauterine death) showed fetal death and 18 (15.92%) neonates required NICU admissions due to respiratory distress, pre-maturity or low birth weight. Vyas *et al.* (2014)<sup>13</sup> had

13.02% NICU admissions. Mohseni *et al.* (2019)<sup>14</sup> in their systematic review and meta-analysis; neonatal mortality and morbidity rate was 0.30% - 13.20% in women with thrombocytopenia with pregnancy. The neonatal mortality and morbidity rate in our study (12.3%) was found comparable to this meta-analysis.

### 5.3 Causes of Thrombocytopenia

Our present study was directed towards identifying the cause of reduced platelet count and the obstetric outcome of thrombocytopenia due to different causes. Of the total 113 cases studied, Gestational thrombocytopenia caused 50.4% followed by severe pre-eclampsia 22.12%, HELLP syndrome 8.8%, abruption 5.3% and antepartum eclampsia and dengue 2.7% each.

Wang *et al.* (2017)<sup>15</sup> found of gestational thrombocytopenia was 60%, hypertensive disorders were 28.2% and other causes including ITP making 11.8% our results were comparable.

Sainio *et al.* (2000)<sup>6</sup> observed gestational thrombocytopenia was 81%, pre-eclampsia was 16% and ITP was 3%. Only full term patients were included in our study and it could be the cause for a higher incidence of pre-eclampsia.

Parnas *et al.* (2006)<sup>16</sup> compared 199 participants with Moderate to severe thrombocytopenia with 201 participants with mild thrombocytopenia with participants without thrombocytopenia and found the gestational thrombocytopenia (59.3%), immune thrombocytopenic purpura (11.05%), preeclampsia (10.05%), and HELLP syndrome (12.06%). The higher incidence of HELLP syndrome in their study could be attributed to their inclusion criteria of moderate and severe thrombocytopenia cases.

Anita *et al.* (2016)<sup>17</sup> in 2017- studied thrombocytopenia in Indian women and found gestational thrombocytopenia was 64%, hypertensive disorders were 21% and others comprised of 13%.

“In a study of Prevalence of Thrombocytopenia during Pregnancy & Its Effect on Pregnancy & Neonatal Outcome” by Arora *et al.* (2017)<sup>18</sup> in 2016 noted that in 1450 deliveries, total 137 women gestational thrombocytopenia (61%) in third trimester. 24% severe preeclampsia and HELLP syndrome.

Ajzenberg *et al.* (1998)<sup>19</sup> concluded that gestational thrombocytopenia invariably occurs in the placental

circulation due to increased platelet consumption or as a part of normal inhibition of platelet production. It generally follows a benign course without any need for interventions.

## 6. Conclusion

The present study concluded that gestational thrombocytopenia is the leading cause of thrombocytopenia. Hypertensive disease coming second HELLP syndrome remains a challenge for all obstetricians. The lack of well-defined symptomatology and clinical presentation makes early and accurate diagnosis difficult leading to delay in treatment. Administration of corticosteroids- dexamethasone should be done as soon as possible for risk reduction in preterm labour. An added benefit would be and increased platelet count, thus reducing adverse maternal and perinatal outcomes.

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