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# Frequency of Gestational Thrombocytopenia in Pregnant OPD Patients: Study in a Tertiary Care Hospital

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***Authors' contributions***

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## ABSTRACT

**Objective:** Gestational thrombocytopenia can lead to fatal complications. Therefore, the present study aimed to evaluate the frequency of Gestational Thrombocytopenia in pregnant patients attending antenatal outpatients department (OPD) at a tertiary care hospital, Karachi.
**Methodology:** This Descriptive observational study was conducted in the department of Obstetrics & Gynecology, Creek general hospital, United Medical & Dental College. All normotensive pregnant patients with no history of Malaria, Systemic Lupus Erythematosus (SLE), Idiopathic Thrombocytopenic Purpura (ITP) were asked to get CBC done which was followed throughout pregnancy. Low platelet counts (<150 $x10^9$/L, the patients were followed up with CBC every 10 days to see the decline. Platelet count of 1208 patients was performed using Minray BC 30 automated analyzer.
**Results:** Out of 1208 pregnant patients, thrombocytopenia was present in 112 (9.3%); 454 were prim gravida, 269 (22.33%) were second gravida while 485 (40.1%) were multigravida. Out of 112 patients, mild thrombocytopenia was seen in 78 (69.6%), moderate thrombocytopenia was seen in 20 (17.9%) while severe thrombocytopenia was present in 14 (12.5%). Total 996 (82.5%) delivered

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vaginally; thrombocytopenia was present in 96 (85.7%). Lower segment Cesarian section (LSCS) was done in 212 and 16 (14.3%) had thrombocytopenia. No PPH and safe fetal outcome seen.
**Conclusion:** In our study, the majority of the patients had mild gestational thrombocytopenia in pregnancy with no fatal complications. Pregnant females should be routinely screened for thrombocytopenia to avoid the disastrous complication of postpartum hemorrhage.

*Keywords: Pregnant; thrombocytopenia; bleeding; platelets.*

## 1. INTRODUCTION

The hemostasis of the body is managed by platelets. They are non -nucleated cellular fragments of megakaryocytes. Thrombocytopenia is defined as a platelet count less than 150,x$10^9$ / L. In a normal non-pregnant woman, the reference range for platelet count is 150 to 400 x$10^9$/L[1]. There is a 10% fall in the platelet count in normal pregnancy due to hemodilution secondary to expansion of plasma volume. The absolute platelet count remains within normal reference range and reduction occurs during the third trimester. Gestational thrombocytopenia (GT) is a benign condition characterized by mild to moderate fall in platelet count during pregnancy. Platelet counts of less than 50x$10^9$ /L is worrisome because it raises the risk of post-partum hemorrhage after normal vaginal delivery or lower segment caesarean section [1].

The overall incidence of thrombocytopenia with obstetric or medical conditions included in pregnancy is 8% and these excluded, the incidence drops to 5.1% [2]. Gestational thrombocytopenia is a diagnosis of exclusion, with normal platelet counts in early pregnancy and the return to normal platelet count 2-12 weeks postpartum [2]. Thrombocytopenia can be classified as mild (platelet count of 100,000-150,000 x$10^9$/L), moderate (platelet count of 50,000-100,000 x$10^9$/L) or severe (platelet count less than 50,000 x$10^9$/L) [3]. Other causes of thrombocytopenia in pregnancy include bone marrow disease, hypersplenism or congenital platelet disorder [4]. Thrombocytopenia is also an indicator of severity of certain complex clinical disorders in pregnancy, such as preeclampsia and hemolysis elevated liver enzymes and low platelet HELLP syndrome. Other autoimmune diseases, including systemic lupus erythematosus, antiphospholipid syndrome, thrombotic thrombocytopenic purpura , hemolytic uremic syndrome, and immune thrombocytopenia (ITP) may relapse or be first detected during pregnancy [4].

In 70-80% of cases, the cause is Gestational thrombocytopenia; Hypertensive disorders account for approximately 20% of all cases of thrombocytopenia in pregnancy [5]. ITP occurs in 1 in 1000 to 10 000 pregnancies accounts for 3% of all cases of thrombocytopenia during pregnancy & common cause of a platelet count below 50 x$10^9$/L detected in the first and second trimesters [5]. If physiology of pregnancy is reviewed, mild Thrombocytopenia does occur with no reported adverse effects on the mother and fetus. In contrast, Thrombocytopenia in pregnancy is associated with medical conditions is usually accompanied with serious consequences on the mother and fetus [5]. The optimum platelet count at which vaginal delivery can be safely conducted is greater than 30.000/µL; Operative vaginal or cesarean deliveries can be managed at 50.000 platelets/µL & around 75.000-80.000/ for application of a safe epidural anesthesia. Decrease of platelets below 20x109/L is associated with risk of spontaneous bleeding and when the count is below 10x109/L, the risk of internal bleeding raises [5].

The function of the platelets is to provide primary hemostasis and hence low platelet counts present with epistaxis, gingival bleeding or abnormal uterine bleeding; other common signs are petechiae and ecchymosis. In clinical practice, Life-threatening uterine bleeding is reported frequently in patients with extremely low platelet levels, presenting as hematuria, gastrointestinal bleeding and, rarely, intracranial hemorrhage [6].

**The initial laboratory diagnosis** of thrombocytopenia should be based on a complete blood count and peripheral smear review. The diagnostic work-up of thrombocytopenia might be figured by bone marrow examination additionally [7].

**The physiological changes** of pregnancy include the dilution of platelets by the increased plasma volume that occurs during pregnancy. In healthy, non-pregnant adult women, the low pressure circulation of the splenic sinusoids

transiently pool one-third platelet count of the body. Therefore, the 50% increase in spleen size that occurs during pregnancy would also contribute to a lower platelet count. Similarities between the placental circulation and the splenic circulation is also responsible for the accumulation of platelets within the intervillous space of the placenta. The large placental size or the presence of two placentae could be the cause of lower platelet counts observed in women with twin pregnancies than in the women with singleton pregnancies. A thrombocytopenic gravida is at risk of postpartum hemorrhage after c-section, labor or in the puerperium especially at platelet count below 50 $x10^9$/L [8]. Severity of maternal and fetal complications are grave with thrombocytopenia caused by ITP and SLE. Thrombocytopenia incidence during pregnancy or in the immediate postpartum period is between 8 to 10% [9]. Other less common causes of thrombocytopenia in pregnancy include coagulopathy related to sepsis/disseminated intravascular coagulation (DIC), microangiopathic hemolytic anemia with thrombotic thrombocytopenic purpura and kidney injury [10].

## 2. METHODOLOGY

The descriptive observational study was performed in the department of Obstetrics & Gynecology for the period from September 2018 till December 2020. A non-randomized sampling technique was used to recruit the participants. Approval for this study was obtained from the Institutional review board of United Medical and Dental college. Written consent was taken. All pregnant patients aged above 18 years who gave informed consent, were normotensive with blood pressure < 140/ 90 mmHg) and did not have any malarial parasites or platelet aggregation on peripheral film were included in the study. with attending antenatal OPD were asked to get their CBC done throughout pregnancy. Renal function tests were conducted to exclude Hemolytic Uremic Syndrome (HUS), blood film findings were studies to exclude Thrombotic thrombocytopenic purpura (TTP), liver function tests were also performed to exclude liver disease and detailed urine analysis to examination for proteinuria.

Depending on the platelet count (<150 X $10^9$, they were followed with CBC every 10 days to see the decline in the platelet count correlated with clinical history. Among the pregnant women The patients with diagnosed hematological and bleeding disorders Malaria, HIV and HBV infection, Idiopathic thrombocytopenic purpura SLE and other connective tissue diseases.

Laboratory analysis: Three milliliters of blood was dispensed into EDTA anticoagulant tubes. The specimens were labeled with subject's age, sex and identification number. The EDTA samples were kept at room temperature until processed within 4 hours of collection. Laboratory Analysis Platelet count was performed using the Mindray BC 30 Automated haematology Analyzer. Standardization, calibration of instruments and processing of samples were done according to manufacturer's instructions. Quality Control: Thin blood films stained with Leishman stain were prepared for all blood samples, to confirm thrombocytopenia and exclude the presence of platelet aggregation and malaria parasites.

### 2.1 Statistical Analysis

Student's T test was used to test for the significance between mean platelet counts of pregnant women and controls. Chi- square was used to test for statistical significance between the proportion of pregnant women who were thrombocytopenic and normal controls. The Odds ratio was also calculated. A value less than 0.05 was considered significant.

## 3. RESULTS

A total of 1208 pregnant patients were enrolled; thrombocytopenia was present in 112 (9.3%).

Out of the 112 patients, mild thrombocytopenia was seen in 78 (69.6%), moderate in 20 (17.9%) while severe was seen in 14 (12.5%).

### 3.1 Demographic Profile

**Age:** The age range was divided into 4 sectors. In the age range up to 20 years, 8 patients had thrombocytopenia. Out of all mild thrombocytopenia cases, six (7.7%) were aged 20 years or less, 37 (47%) patients were between 21-25 years, and 32 (41%) were aged 26-30 years, and 3 (4%) were above the age of 30 years. Similarly, majority of the moderate and severe cases were between 26-30 years old; 11 (55%) and 10 (71%), respectively (Table 1).

**Status of gravida:** Out of the total, 454 were prim gravida, 269 (22.33%) were second gravida while 48 (42.9%) were multigravida.

Thrombocytopenia was seen in 39 (34.8%) prim gravida, 25 (22.3%) second gravida and 48 (42.9%) multigravida. PRIMIGRAVIDA: Out of 39 prim gravida, mild thrombocytopenia was seen in 27, moderate in 7 while severe in five patients. Second gravida: 25 (22.33%) were second gravida. Out of 25 second gravida, mild thrombocytopenia was seen in 18, moderate in 3 while severe was seen in 4. Multigravida: while 48 (42.9%) were multigravida. Out of 48 (42.9%) multigravida, mild thrombocytopenia was seen in 33, moderate was seen in 10 while severe was seen in 5 (Table 1).

**Mode of delivery:** Out of the total 1208 patients, vaginal mode of delivery was seen in 996 (82.5%) patients. Episiotomy was given in 501 (41.5%) while 212 (17.5%) underwent lower segment cesarean section. If a detailed review of 112 thrombocytopenic patients is taken, 96 patients delivered vaginally. Out of these, 64 had mild thrombocytopenia, while 20 had moderate and severe was seen in 12. Lower segment cesarean section was done in 16 (14.3%) out of which mild thrombocytopenia was seen in 14, moderate was seen in none while 2 patients had severe thrombocytopenia (Table 1).

**Complications:** Complications like hematoma in the episiotomy or uterine bleeding were not seen. The incidence of postpartum hemorrhage, rate of stillbirth and neonatal Apgar scores at 5 minutes were similar to normal pregnancies. None of the newborns showed any signs of hemorrhagic diathesis and no cases of neonatal deaths. Patients were considered to have GT if the platelet counts returned to normal within 12 weeks of delivery, whereas diagnosis of ITP was made whenever this was not the case. In clinical practice, vaginal delivery was planned without transfusion if the patient's platelet count was more than 75 $x10^9$/L. When the patient's platelet count was less than 50 x $10^9$/L, platelet transfusion was considered before delivery.

**Table 1. Epidemiological profile**

| | | Thrombocytopenia | | | | Chi Sq. P value |
|---|---|---|---|---|---|---|
| | | Total | Mild | Moderate | severe | |
| Gravida | Primi Gravida | 39 (35%) | 27 (35%) | 7 (35%) | 5 (36%) | .885 |
| | Secondary Gravida | 25 (22%) | 18 (23%) | 3 (15%) | 4 (28%) | |
| | Multi Gravida | 48 (43%) | 33 (42%) | 10 (50%) | 5 (36%) | |
| Age | Up to 20 years | 8 (7%) | 6 (8%) | 2 (10%) | 0 (0%) | .413 |
| | 21 to 25 years | 58 (52%) | 37 (47%) | 11 (55%) | 10 (71%) | |
| | 26 - 30 Years | 41 (37%) | 32 (41%) | 5 (25%) | 4 (29%) | |
| | above 30 years | 5 (4%) | 3 (4%) | 2 (10%) | 0 (0%) | |
| Mode of | LSCS | 16 (14%) | 14 (18%) | 0 (0%) | 2 (14%) | .123 |
| Delivery | SVD | 96 (86%) | 64 (82%) | 20 (100%) | 12 (86%) | |
| Vaginal | not present | 109 (97%) | 76 (97%) | 19 (95%) | 14 (100%) | .669 |
| discharge present | present | 3 (3%) | 2 (3%) | 1 (5%) | 0 (0%) | |
| Episiotomy cut made | no episiotomy cut done | 70 (63%) | 47 (60%) | 13 (65%) | 10 (71%) | 0.70 |
| | episiotomy made | 42 (38%) | 31 (40%) | 7 (35%) | 4 (29%) | |

**Table 2. Thrombocytopenia and its parity**

| | No thrombocytopenia | Thrombocytopenia | P-Value Test |
|---|---|---|---|
| Parity | 1.27±1.29 | 1.36±1.29 | *0.488* |
| Gestational Weeks | 37.93±3.62 | 33.96±7.44 | *0.000* |
| Platelet Count | 287807.48±78503.33 | 106168.75±38292.74 | *0.000* |
| Age | 24.87±3.52 | 25.02±3.3 | *0.677* |

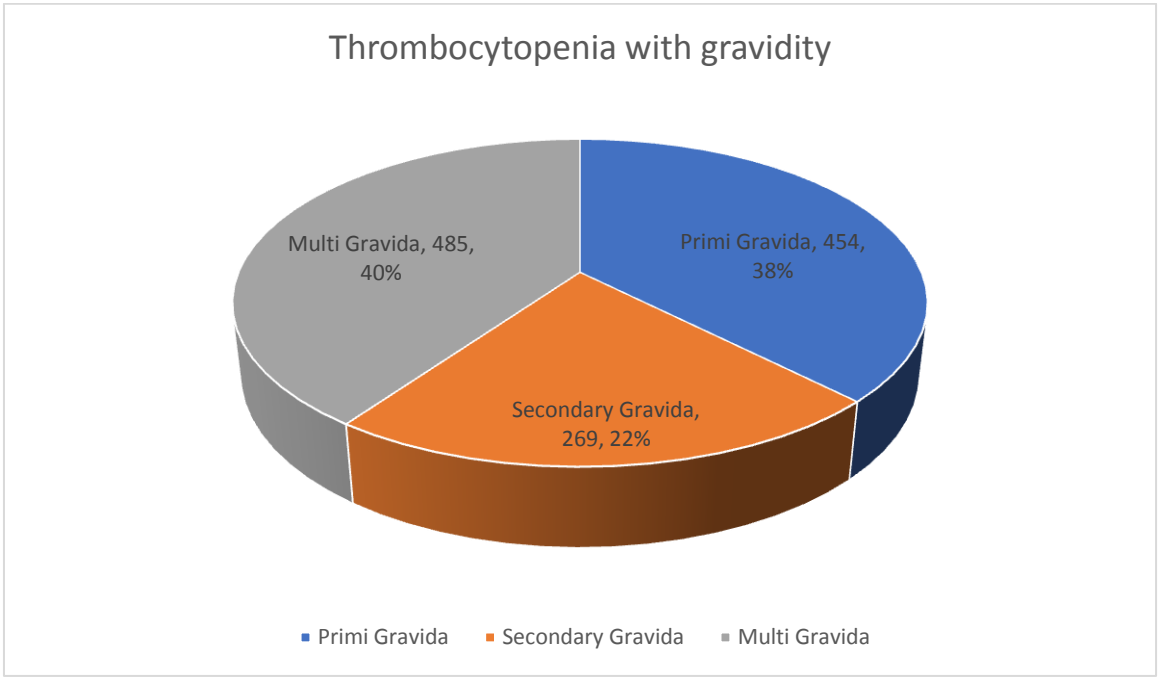


**Fig. 1. Thrombocytopenia with gravidity**

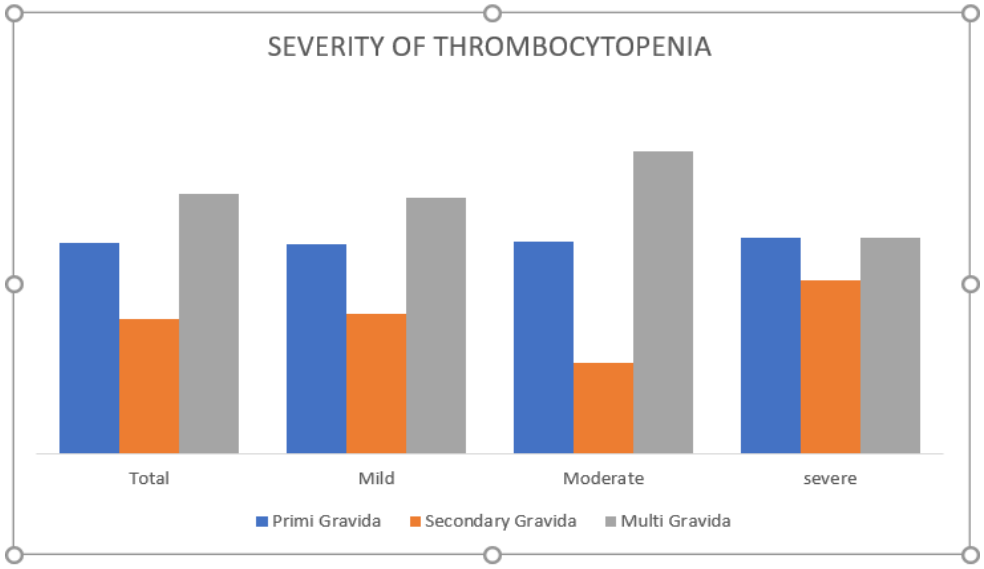


**Fig. 2. Severity of thrombocytopenia**

## 4. DISCUSSION

This research was designed to determine the frequency of gestational thrombocytopenia in pregnant women attending antenatal OPD at Creek general hospital. Diagnosing gestational thrombocytopenia is challenging as the exact mechanism is not known [11]. The prevalence of gestational thrombocytopenia in a Ghanian study was 15.3% higher than 11.6% reported by Boehlen et al & the frequency of 9.3% in our hospital [12,13].

Most of the cases of thrombocytopenia (76%) in Ghanian study were mild; which is in concordance with the finding of Boehlen [13] and our research with (69.6%) mild thrombocytopenia [12].

In one of the researches at Oklahoma university medical center, moderate platelet count was seen in 45 (1%) women higher than our count of 20 women with moderate thrombocytopenia [7].

Platelet counts of less than 80 X $10^9$ per cubic millimeter in non-complicated pregnancies occurred in only 5 women (0.1%) in contrast to 14 (12.5%) in our study [7].

Again, Sainio et al. [2] only studied full term pregnant women so they might have missed some pregnant women who were thrombocytopenic earlier in pregnancy. Thus, the fact that this study included pregnant women in all trimesters may explain the higher prevalence. From our findings, gestational thrombocytopenia occurred across the three trimesters, this was against the study of Crowther et al. [14] who reported that gestational thrombocytopenia in pregnancy is a disorder that develops primarily in the late second or third trimester. Most of the cases of thrombocytopenia (76%) in our study were mild with platelet counts above; this agrees with the finding of Boehlen [13].

Although gestational thrombocytopenia has been recognized for more than 25 years, [1] the course of platelet counts throughout pregnancy and the potential severity of gestational thrombocytopenia have not been defined.

The data of Ghanian study showed that women with gestational thrombocytopenia had a decline in platelet counts from the first trimester and continued throughout pregnancy [1]. This is in contrast to the report by Crowther et al and our research which reports that platelet count drops in gestational thrombocytopenia in the late second or third trimester [14].

In our study, all patients with gestational thrombocytopenia conducted successful delivery without bleeding complication. This is similar to a South Korean study conducted at Kangham sacred hospital. [15].

The study by Nagey et al showed that of 730 pregnancies with platelet counts of less than 150 × $10^9$ /L, and no bleeding complications were observed. This correlates with our study [16,17].

## 5. CONCLUSION

This study concludes that Gestational Thrombocytopenia is very innocuous and not associated with disastrous maternal or fetal complications. Good antenatal care and management in a tertiary care hospital with availability of blood bank is the secret of success.

## CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Olayemi E, Akuffo FW. Gestational thrombocytopenia among pregnant Ghanaian women. Pan Afr Med. 2012;12:34.
   Epub 2012 Jun 18
2. Ajibola SO, Akinbami A, Rabiu K, Adewunmi A, Dosunmu A, Adewumi A, et al. Gestational thrombocytopaenia among pregnant women in Lagos, Nigeria. Niger Med J. 2014;55(2):139-43.
3. Asrie F, Enawgaw B, Getaneh Z. Prevalence of thrombocytopenia among pregnant women attending antenatal care service at Gondar University Teaching Hospital in 2014, northwest Ethiopia. J Blood Med. 2017;8:61-66.
4. Lin YH, Lo LM, Hsieh CC, Chiu TH, Hsieh TT, Hung TH. Perinatal outcome in normal pregnant women with incidental thrombocytopenia at delivery. Taiwan J Obstet Gynecol. 2013;52(3):347-50.
5. Ciobanu AM, Colibaba S, Cimpoca B, Peltecu G, Panaitescu AM. Thrombocytopenia in Pregnancy. Maedica (Bucur). 2016;11(1):55-60.

6. Ubtil SFC, Mendes JMB, Areia ALFA, Moura JPAS. Update on Thrombocytopenia in Pregnancy. Rev Bras Ginecol Obstet. 2020;42(12):834-840. Epub 2020 Dec 21
7. Smock KJ, Perkins SL. Thrombocytopenia: An update. Int J Lab Hematol. 2014;36(3):269-78. DOI: 10.1111/ijlh.12214
8. Federici L, Serraj K, Maloisel F, Andrès.8.Thrombocytopenia during pregnancy: from etiologic diagnosis to therapeutic management] Presse Med. 2008;37(9):1299-307.
9. Cines DB, Levine LD. Thrombocytopenia in pregnancy Blood. 2017;130(21):2271-2277.
10. Wang X, Xu Y, Luo W, Feng H, Luo Y, Wang Y, Liao H Thrombocytopenia in pregnancy with different diagnoses: Differential clinical features, treatments, and outcomes. Medicine (Baltimore). 2017;96(29)
11. Fogerty AE. Thrombocytopenia in pregnancy: Mechanisms and management. Transfus Med Rev. 2018;32(4):225-229.
12. Sainio S, Kekomäki R, Riikonon S, Teramo K. Maternal thrombocytopenia at term: a population-based study. Acta Obstet Gynecol Scand. 2000;79(9):744-9.
13. Boehlen F. Thrombocytopenia during pregnancy: Importance, diagnosis and management. Hamostaseologie. 2006;26(1):72-74.
14. Crowther MA, Burrows RF, Ginsberg J, Kelton JG. Thrombocytopenia in pregnancy: diagnosis, pathogenesis and management. Blood Rev. 1996;10(1):8-16.
15. Kim BJ, Kim HS, Kim JH, Lee KY. Moderate to Severe Thrombocytopenia During Pregnancy: A Single Institutional Experience. Indian J Hematol Blood Transfus. 2017;33(4):581-585.
16. Nagey DS, Alger LS, Edelmann BB, Heyman MR, Pupkin MU, Crenshaw C Jr. Reacting appropriatelyto thrombocytopenia in pregnancy. South Med J. 1986;79:1385-8.
17. Sullivan CA, Martin JN Jr. Management of the obstetric patient with thrombocytopenia. Clin Obstet Gynecol. 1995;38:521-34.




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