

Original Research Article

Frequency of Gestational Thrombocytopenia in pregnant OPD patients: Study in a tertiary care Hospital.

ABSTRACT:

Objective: To evaluate the frequency of Gestational Thrombocytopenia in pregnant patients attending antenatal 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. **The purpose** of the study was to determine the prevalence of Gestational thrombocytopenia among pregnant women reporting for antenatal care at Creek General Hospital. All normotensive pregnant patients with no history of Malaria, SLE, ITP were asked to get CBC done which was followed throughout pregnancy. Low platelet counts ($<150,000$, 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 vaginally; thrombocytopenia was present in 96 (85.7%). LSCS was done in 21 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.

Key words: pregnant, thrombocytopenia, bleeding, platelets.

Comment [d1]: The abstract is missing Background information

Comment [d2]: First time you mention an abbreviation, you should write the full name of it.

Comment [d3]: The purpose repeats the objective

Comment [d4]: First time you mention an abbreviation, you should write the full name of it.

Comment [d5]: No units of measurement? You should use SI units in the whole text $<150 \times 10^9/L$

Comment [d6]: You should write what this abbreviation means.

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INTRODUCTION

The homeostasis of the body is managed by platelets. They are non-nucleated cellular fragments of megakaryocytes. Thrombocytopenia is defined as a platelet count less than $150,000 \times 10^9/L$. In a normal non-pregnant woman, the reference range for platelet count is 150 to $400 \times 10^9/L$. There is a 10% fall in the platelet count in normal pregnancy due to haemodilution secondary to expansion of plasma volume. The absolute platelet count remains within normal reference range and the fall 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 $50 \times 10^9/L$ is worrisome because of 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 5.1⁸⁶. Gestational thrombocytopenia is a diagnosis of exclusion, with normal platelet counts in early pregnancy and the return to normal platelet count 2-12 weeks postpartum². Thrombocytopenia can be classified as mild (platelet count of $100,000-150,000 \times 10^9/L$), moderate (platelet count of $50,000-100,000 \times 10^9/L$) or severe (platelet count less than $50,000 \times 10^9/L$)³. Other causes of Thrombocytopenia in pregnancy include bone marrow disease, hypersplenism or congenital platelet disorder⁴. 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 pregnancy⁴.

In 70-80% of cases, the cause is Gestational thrombocytopenia; Hypertensive disorders account for approximately 20% of all cases of thrombocytopenia in pregnancy⁵. 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 $50 \times 10^9/L$ detected in the first and second trimesters⁵. 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 fetus⁵. The optimum platelet count at which vaginal delivery can be safely conducted is greater than $30,000/\mu L$; Operative vaginal or cesarean deliveries can be conducted at $50,000$ platelets/ μL & around $75,000-80,000/$ for application of a safe epidural anaesthesia; Below a count of $20,000$ platelets/ μL , risk of spontaneous bleeding with platelet count below $20,000$ platelets/ μL and there is a risk of internal bleeding if the platelet count is below $10,000/\mu L$ 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

Comment [d8]: Maybe you meant hemostasis, not homeostasis.

Comment [d9]: $150 \times 10^9/L$

Comment [d10]: You may use "reduction" or "decline" in order to avoid repetition of the word fall.

Comment [d11]: ...raise the risk of...

Comment [d12]: Is this a citation?

Comment [d13]:

Comment [d14]: Why you use ; instead of dot (.)

Comment [d15]: You may use a synonym of conduct such as handle, manage.

Comment [d16]: Decrease of platelets below $20 \times 10^9/L$ is associated with risk of spontaneous bleeding and when the count is below $10 \times 10^9/L$, the risk of internal bleeding raises.

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 hemorrhage⁶.

The initial laboratory diagnosis of thrombocytopenia should be based on a complete blood count and peripheral smear review. Detailed evaluation is possible with bone marrow examination, to reach a diagnosis.

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 section, labour or in the puerperium especially at platelet count below $50 \times 10^9/L$ 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 injury¹⁰.

METHODOLOGY:

This was a descriptive observational study conducted in the department of Obstetrics & gynecology from September 2018 till December 2020. Sampling technique was simple, convenient. Approval for this study was obtained from the Institutional review board of United Medical and Dental college. Written consent was taken. All pregnant patients attending antenatal OPD were asked to get their CBC done throughout pregnancy. Depending on the platelet count ($<150,000$, they were followed with CBC every 10 days to see the decline in the platelet count correlated with clinical history. Among the pregnant women who gave informed consent, only normotensive with blood pressure $< 140/90$ mmHg) and those without any malaria parasites or platelet aggregation on peripheral film were included. 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

Comment [d17]: The diagnostic work-up of thrombocytopenia might be figured by bone marrow examination additionally.

Comment [d18]: The descriptive observational study was performed in the department of Obstetrics & Gynecology for the period from September 2018 till December 2020.

Comment [d19]: You should explain exactly what are the including criteria.

Leishman stain were prepared for all blood samples, to confirm thrombocytopenia and exclude the presence of platelet aggregation and malaria parasites.

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.

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%).

Demographic profile:

AGE:

The age range was divided into 4 sectors. In the age range upto 20 years, 8 patients had thrombocytopenia. Mild in 6(7.7%), moderate in 2 (10%) while no patient had severe thrombocytopenia. Between 21-25 years, 58 patients had thrombocytopenia. Mild was seen in 37(47.4%), moderate was seen in 11(55 %) while severe was seen in 10 (71.4%). Between 26-30 years, 41 patients had thrombocytopenia. Mild was seen in 32(41 %), moderate was seen in 5(25%) while severe was seen in 4 (28.6%). In the age above 30 years, thrombocytopenia was seen in 5(4.5%). Mild thrombocytopenia was seen in 3(3.8%), moderate was seen 2(10%) while no patient had severe thrombocytopenia. Table...

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(34.8%), moderate in 7(35.0%) while severe in 5(35.7%). **Second gravida:** 25(22.33%) were second gravida. Out of 25 second gravida, mild thrombocytopenia was seen in 18 (23.1%), moderate in 3 (15.0%) while severe was seen in 4(28.6%). **Multigravida:** while 48(42.9%) were multigravida. Out of 48 (42.9%) multigravida, mild thrombocytopenia was seen in 33(42.3%), moderate was seen in 10(50%) while severe was seen in 5(35.7%). Table...

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 212 thrombocytopenic patients is taken, 96 patients delivered vaginally. Out of these, 64 (82.1%) had mild thrombocytopenia, while 20 had

Comment [d20]: The mentioned percentage is not about the pointed age group up to 20 years. 6 pts out of 8 is not 7.7%. This percentage is out of all cases with mild thrombocytopenia, but the meaning of the sentence is different. The same mistake is repeated below.

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moderate and severe was seen in 12(85.7%). Lower segment cesarean section was done in 16(14.3%) out of which mild thrombocytopenia was seen in 14(17.9%), moderate was seen in none while 2 patients had severe thrombocytopenia. Table...

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 5minutes 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 $75 \times 10^9/L$. When the patient's platelet count was less than $50 \times 10^9/L$, platelet transfusion was considered before delivery.

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 known¹¹. 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; this agrees with the finding of Boehlen (2006) 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 80,000 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 report of Crowther et al (1996)¹⁵ 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 (2006)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

Comment [d22]: You may use "which is in concordance with..." or "similarly to..."

Comment [d23]: SI units everywhere in the text - $80 \times 10^9/L$

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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.¹⁵

In our study, all patients with gestational thrombocytopenia conducted successful delivery without bleeding complication. This is similar to a South Korean study conducted at Kangnam sacred hospital.¹⁴

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

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.

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TABLE 1 Epidemiological profile

		thrombocytopenia			Chi Sq. Pvalue	
		Total	Mild	Moderate		severe
Gravida	Primi Gravida	39 (35%)	27 (35%)	7 (35%)	5 (36%)	.885(a)
	Secondary Gravida	25 (22%)	18 (23%)	3 (15%)	4 (29%)	
	Multi Gravida	48 (43%)	33 (42%)	10 (50%)	5 (36%)	

Comment [d25]: What shows this (a), (b)?

Comment [d26]: The sum of the cases with severe thrombocytopenia must be 100%, but in the table it is 101%.

Age	Upto 20 years	8 (7%)	6 (8%)	2 (10%)	0 (0%)	.413(a,b)
	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 Delivery	LSCS	16 (14%)	14 (18%)	0 (0%)	2 (14%)	.123(a)
	SVD	96 (86%)	64 (82%)	20 (100%)	12 (86%)	
Vaginal discharge present	not present	109 (97%)	76 (97%)	19 (95%)	14 (100%)	.669(a,b)
	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
Gestationa l Weeks	37.93±3.62	33.96±7.44	0.000
Platelet Count	287807.48±78503.3	106168.75±38292.74	0.000
Age	24.87±3.52	25.02±3.3	0.677

FIGURE 1Thrombocytopenia with gravidity

FIGURE 2: severity Of Thrombocytopenia

