

Pattern of Thrombocytopenia in Pregnancy at Teaching Hospital of Rahim Yar Khan, Pakistan

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Article Processing

Received: 14/09/2022
Accepted: 14/11/2022

Cite this Article: Muhammad Bilal Ghafoor, Faiza Sarwar, Tahira Afzal Durrani, Zainab Quratulain Azher, Saleha Jabeen, Muhammad Haris Ali Khan. Pattern of Thrombocytopenia in Pregnancy At Teaching Hospital Of Rahim Yar Khan, Pakistan

<https://www.journalrmc.com/index.php/JRMC/article/view/2053>

DOI: <https://doi.org/10.37939/jrhc.v26i4.2053>

Conflict of Interest: Nil

Funding Source: Nil

Abstract

Introduction: Platelet count less than $150 \times 10^9 / L$ is referred to as thrombocytopenia, which is the second common blood disorder in pregnancy after anemia. Although pregnancy is related with physiological variations in platelet count, however, several pathological conditions also cause thrombocytopenia showing significant impact on health of mother and her baby. The prevalence of thrombocytopenia during pregnancy is 7 to 11%. The physiological thrombocytopenia is multifactorial, related to hemodilution, increased platelet consumption and increased platelet aggregation.

Objective: To determine the pattern of thrombocytopenia during third trimester of pregnancy in Rahim Yar Khan.

Materials and Methods: This cross-sectional study was carried out at Teaching Hospital of Rahim Yar Khan with effect from May 16, 2022 to September 30, 2022. Five hundred (500) pregnant females in their third trimester were the part of this study. All the study subjects were selected from the department of gynecology and obstetrics at Sheikh Zayed Hospital, Rahim Yar Khan which is a renowned teaching hospital of the region attached with Sheikh Zayed Medical College. Data collection was done on a pre-designed questionnaire. Sample of blood was taken in EDTA and Gel containing vacutainers by convenient sampling technique.

Results: The frequency of thrombocytopenia during pregnancy was found 10.4%. Gestational thrombocytopenia was the most common type among thrombocytopenic pregnancies with frequency of 63.46% in comparison to pre-eclampsia 30.76%, HELLP Syndrome 3.80% and immune thrombocytopenic purpura 1.90%. The mean age of pregnant women was observed 27.53 ± 5 years. There is no significant difference in number of thrombocytopenic patients from rural and urban areas ($p=0.2$).

Conclusion: The frequency of thrombocytopenia during the third trimester of pregnancy is observed high, so the regular screening is necessary to avoid any adverse outcome. Specially the patients with Pre-eclampsia and HELLP syndrome should be monitored critically.

Keywords: Platelet Count, Thrombocytopenia in Pregnancy, Types of Thrombocytopenia, Pre-Eclampsia

Introduction

In normal hemostasis, there is a close interactions between platelets, blood vessels, fibrinolytic system and clotting factors. When blood vessel gets ruptured, binding of platelets to exposed collagen results in platelet activation followed by platelet aggregation⁽¹⁾. Platelets play a key role in hemostasis, inflammation and immunity ⁽²⁾. The lifespan of platelets is 7-10 days and normal count is $150 - 450 \times 10^9/L$. Amongst the normal count, 70% platelets remain in circulation all the times, while 30% are arrested by the spleen ⁽³⁾. Thrombocytopenia is the commonest hematological complication with a platelet count less than $150 \times 10^9 / L$ ⁽⁴⁾. Thrombocytopenia is classified as mild thrombocytopenia ($100-150 \times 10^9/L$), moderate thrombocytopenia ($50-100 \times 10^9/L$) and severe thrombocytopenia (less than $50 \times 10^9/L$) ⁽⁵⁾. During normal pregnancy, there is a physiological decrease in platelet count due to hemodilution, increased consumption in peripheral tissues and increased aggregation due to higher levels of thromboxane A2 ⁽⁶⁾, 7-11% pregnant women face the state of thrombocytopenia and majority of them remain asymptomatic ⁽⁷⁾. Common causes of thrombocytopenia during pregnancy are gestational thrombocytopenia (60-75%), Thrombocytopenia associated with pre-eclampsia and HELLP syndrome (21%) and immune thrombocytopenic purpura (3-10%) ⁽⁸⁾. The second most common cause of thrombocytopenia during pregnancy is associated with pre-eclampsia and HELLP (hemolysis, elevated liver enzymes, low platelet count) ⁽⁹⁾. Thrombocytopenia due to aplastic anemia, leukemia, malaria and folate deficiency is less common ⁽¹⁰⁾. In gestational thrombocytopenia, there is a slight decrease in platelet count (more than $70 \times 10^9/L$) which is not associated with fetal thrombocytopenia and it exhibits no significant morbidity or mortality ⁽¹¹⁾. In this state the platelet count returns to normal within 2 to 3 months after delivery ⁽¹²⁾. Thrombocytopenia occurs at the end of the second or third trimester of pregnancy ⁽¹³⁾. Pre-eclampsia affects 21% of all pregnancies resulting in 22% of peri-natal deaths and 30% maternal deaths ⁽¹⁴⁾.

This situation is much worst in developing countries due to the low number of prenatal visits, late reports and ineffective management in health care facilities ⁽¹⁵⁾.

Pregnant women under the age of 20 or over the age of 30 years are more often affected by this illness ⁽¹⁶⁾. In Primigravida, 6% of pregnancies are complicated by pre-eclampsia with features of recent hypertension (Blood pressure more than 140 mmHg systolic or more than 90 mmHg diastolic) after 20 weeks of pregnancy, associated with proteinuria (more than 300 mg protein) in a 24-hour urine sample ⁽¹⁷⁾. Due to the increased activation of endothelial cells in this condition, there is an increase in platelet activation and the coagulation cascade resulting in the first sign "thrombocytopenia" ⁽¹⁸⁾. Less than 5% of pre-eclamptic women have platelet counts less than $50 \times 10^9 / L$ ⁽¹⁹⁾. In these patients, systemic endothelial dysfunction leads to increased activation of the coagulation system and affects various organs, especially the kidneys ⁽²⁰⁾. HELLP syndrome is one of the pre-eclampsia complications one has to face during pregnancy and it affects 0.5 to 0.9% of all pregnancies ⁽²¹⁾. Up to 3% of HELLP cases can lead to maternal mortality and 20% in still births ⁽²²⁾. It occurs usually after abruption of placenta and premature delivery ⁽²³⁾. Immune thrombocytopenic purpura is an autoimmune illness in which anti-platelet IgG antibodies are produced against their own membranous glycoproteins resulting in the increased platelet destruction in the reticuloendothelial system, mainly in the spleen. Platelet destruction rates are higher than the production and thus thrombocytopenia develops ⁽²⁴⁾. In adults it is generally a chronic disease that mainly affects young women. There are only 3% of ITP cases during pregnancy and the estimated frequency is 0.1-1/1000 pregnancies ⁽²⁵⁾. Immune thrombocytopenia is usually detected in the first trimester of pregnancy ⁽²⁶⁾. This needs proper treatment to prevent bleeding especially when platelet count drops below $30 \times 10^9/L$ ⁽²⁷⁾. Patients may experience symptoms such as bleeding from gums, petechiae, purpura, or might remain asymptomatic ⁽²⁸⁾. Thrombocytopenia in pregnancy is an unexplored condition in Pakistani women, especially the rural areas due to the lack of medical and diagnostic facilities. So the current study was planned to find out the frequency of thrombocytopenia in pregnant women visiting teaching hospital of Rahim Yar Khan, a district of Southern Punjab, Pakistan.

Objective:

To determine the pattern of thrombocytopenia during third trimester of pregnancy at Sheikh Zayed Hospital

Rahim Yar Khan, a renowned teaching hospital attached with Sheikh Zayed Medical College.

Materials and Methods

This was a cross-sectional study including five hundred pregnant females who visited outdoor patient department (OPD) or were admitted in gynecology and obstetrics ward of Sheikh Zayed Hospital, Rahim Yar Khan with effect from May 16, 2022 to September 30, 2022. Convenient sampling technique was used. The data was collected by using a predesigned questionnaire. The variables included in questionnaire were name, age, gravidal status, history of menstrual bleeding during pregnancy, history of abnormal menstrual bleeding before pregnancy, platelets count and area of residence. Venous blood (6ml) was collected, 3ml in EDTA vacutainer and 3 ml in gel vacutainer. Platelet count was done on five-part automatic hematology analyzer BT-Pro 2400, liver function tests were performed on Beckman coulter AU-680 and urine for albumin by urine Strip (10 parameter Roche) at Pathology Department of Sheikh Zayed Medical College/Hospital Rahim Yar Khan. The collected data was statistically analyzed using Statistical Package for Social Sciences (SPSS) Program for version 20.

Results

The mean age of pregnant females included in this study was 27.5 years with standard deviation of 4.92 and the mean number of pregnancies was 2.8±1.88, whereas systolic and diastolic blood pressure were 116.22 ± 10.96 and 77.68 ± 7.59 respectively (Table I). Table II shows that 52 pregnant females had platelet count <150 × 10⁹/L with frequency of thrombocytopenia (10.4%). Gestational thrombocytopenia was detected in 33(6.4%) pregnant females whereas 16(3.2%) had pre-eclampsia, 2(0.4%) had HELLP Syndrome and only 1(0.2%) had immune thrombocytopenic purpura (ITP) (Table III). Figure I shows causes of thrombocytopenia in pregnant women. Among 500 pregnant females who participated in this study, 316(63.2%) lived in urban areas and only 184(36.8%) were from rural areas (Figure II). Table IV shows no significant difference in percentage of pregnant females having thrombocytopenia whether they lived in urban or rural areas (p value >0.24).

Table 1: Statistics According to Demographic Variables (n=500)

Parameters	Mean ± Standard Deviation
Age	27.53 ± 4.917 (years)
No. of Pregnancies	2.81 ± 1.886 (number)
Systolic Blood Pressure	116.22 ± 10.961 (mmHg)
Diastolic Blood Pressure	77.68 ± 7.585 (mmHg)

Table 2: Pattern of Thrombocytopenia in Pregnancy (n=500)

Platelet Count	Frequency	Percentage
150-450 ×10 ⁹ /L	448	89.6%
<150 × 10 ⁹ /L	52	10.4%
Total	500	100.0%

Table 3: Pattern of Different Types of Thrombocytopenia in Pregnancy (n=500)

Pattern of Thrombocytopenia	Frequency	Percentage
Normal without Thrombocytopenia	448	89.8%
Gestational Thrombocytopenia	33	6.4%
Pre-Eclampsia	16	3.2%
HELLP	2	0.4%
ITP	1	0.2%
Total	500	100.0%

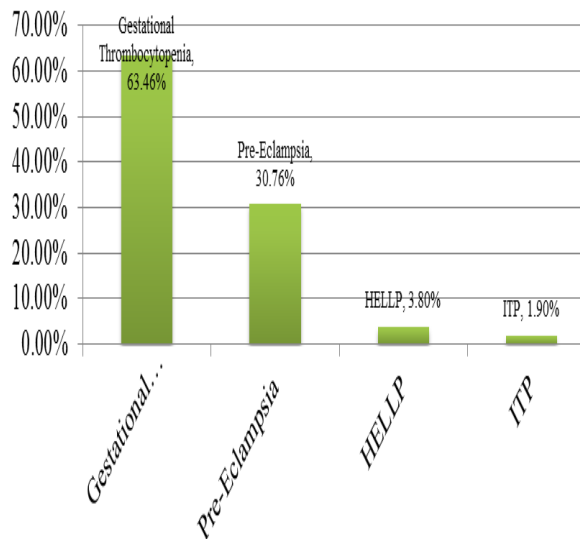


Figure 1: Percentage of Different Causes of Thrombocytopenia during Pregnancy (n=52)

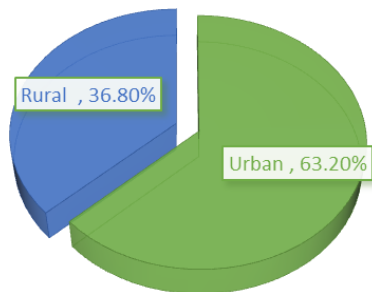


Figure 2: Distribution of Pregnant Women Living in Urban or Rural Areas

Table IV: Pattern of Thrombocytopenia in Relation to Residence in Urban/Rural Areas

Urban/Rural	Platelet Count	
Urban	150-450 × 10 ⁹ /L	< 150 × 10 ⁹ /L
	287	29
	90.82%	9.17%
Rural	161	23
	87.5%	12.5%
	Total	448
P-value	0.24	0.24

Discussion

Thrombocytopenia in pregnancy is the second most common hematological disorder after anemia and is encountered in 7-11% of pregnant women (1). This study was conducted in order to determine the pattern of thrombocytopenia among pregnant women during the third trimester of pregnancy attending the antenatal care at Sheikh Zayed Hospital or visiting Gynecology and Obstetrics department of Sheikh Zayed Hospital, Rahim Yar Khan. The frequency of thrombocytopenia among pregnant women in third trimester was observed 10.4% in present study which is in accordance with the study results of Northwest Ethiopia (8.8%), India (8.8%), Bhopal (11.68%), Hawassa (13.5%), Madhya Pradesh (11.4%), Nigeria (13.5%) and Ghana (15.3%) (29). The difference may be due to socio demographic differences of the study subjects and variation in the study design. The mean age of pregnant women with thrombocytopenia was 27.53±5 years. This results of the current study is comparable with the study carried out at Civil hospital Hyderabad, where the mean age of women was 30.8±5.6 years (30). Another study reported similar findings, the mean age of thrombocytopenia in pregnancy was 26.91±5.28 years (31). Most of the women in this study were primigravida with mean number of pregnancies 2.81±1.89. Mean systolic blood

pressure was 116.22±10.96 and diastolic blood pressure was 77.68±7.59. Frequency of gestational (incidental) thrombocytopenia was 63.46%, pre-eclampsia 30.76%, HELLP (Hemolysis, elevated liver enzymes, low platelet count) associated thrombocytopenia 3.8% and ITP (Immune thrombocytopenic purpura) 1.9%. So, gestational thrombocytopenia was revealed as the most common cause of thrombocytopenia during pregnancy, with pre-eclampsia on second. There were 9.17% thrombocytopenic women who lived in urban areas as compared to 12.5% thrombocytopenic women living in rural areas, it was observed that there is no significant difference (P-value >0.2) in the frequency of thrombocytopenia of pregnant women living in rural and urban areas. In summary, thrombocytopenia is a crucial problem among pregnant women with the prevalence of 10.4%, bearing no significant difference in proportion of thrombocytopenic pregnant women living in urban or rural regions.

Conclusion

Thrombocytopenic pregnancy is connected with maternal and neonatal morbidity and mortality. The prevalence of thrombocytopenia in pregnancy was found 10.4%, the pattern revealed that Gestational Thrombocytopenia is the most common cause of thrombocytopenia in pregnancy followed by Pre-eclampsia, HELLP and ITP. Pregnant women should be routinely screened for thrombocytopenia to avoid any risk of bleeding. Careful surveillance is strongly recommended to establish the etiology and timely intervention. The patients having thrombocytopenia due to Pre-eclampsia and HELLP Syndrome need special attention and vigilant follow up.

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