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Incidence of Thrombocytopenia in Pregnant Females

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ABSTRACT

Background: Thrombocytopenia is a common hematologic disorder in pregnancy, posing potential risks of maternal and fetal complications. Routine monitoring can aid in early detection, yet factors associated with thrombocytopenia in pregnancy remain underexplored.

Objective: This study aimed to determine the frequency of thrombocytopenia in pregnant women and assess its association with demographic and clinical factors, including maternal age, gestational age, parity, hypertension, and diabetes mellitus.

Material and Methods: A descriptive, cross-sectional study was conducted at the **Islamgarh Welfare Trust Hospital, Islamgarh Mirpur Azad Kashmir**, over six months (March 2024 to September 2024). A sample size of 222 pregnant women was calculated based on a 17.5% expected frequency of thrombocytopenia, with a 95% confidence level and 5% margin of error. Non-probability consecutive sampling was employed. Data collection included sociodemographic and clinical variables. Blood samples were analyzed for platelet count, defining thrombocytopenia as <150,000/µL. Chi-square tests were used to assess associations, with a p-value ≤0.05 considered statistically significant.

Results: Thrombocytopenia was identified in 30.2% (n=67) of the participants, while 69.8% (n=155) did not exhibit thrombocytopenia. No statistically significant associations were observed between thrombocytopenia and maternal age (p=0.340), gestational age (p=0.303), parity (p=0.303), hypertension (p=0.406), or diabetes mellitus (p=0.948). These findings suggest that thrombocytopenia in pregnancy may frequently occur independently of these factors.

Conclusion: Thrombocytopenia affected a significant portion of this sample population. Although not significantly associated with the studied factors, routine platelet monitoring in pregnancy remains essential for early detection and management.

Keywords: *Thrombocytopenia, Pregnancy, Maternal Age, Gestational Age, Platelet Count, Antenatal Care*

1. INTRODUCTION

Thrombocytopenia, defined by a platelet count below 150,000/mm³, is the second most prevalent hematological disorder during pregnancy, affecting approximately 7-10% of expectant mothers [1]. Given the intricate physiological and immunological changes that accompany pregnancy, differentiating benign gestational thrombocytopenia from other severe etiologies can be challenging yet essential for optimal maternal and fetal outcomes. Gestational thrombocytopenia, typically mild and asymptomatic, accounts for the majority of cases and is usually transient. However, other causes like preeclampsia, HELLP (hemolysis, elevated liver enzymes, low platelets) syndrome, and immune thrombocytopenic purpura (ITP) present significantly higher risks, necessitating vigilant monitoring and management [2,3].

During the last decade, studies have demonstrated the multiple causative factors of thrombocytopenia in pregnancy, including hypertensive disorders of pregnancy, autoimmune factors, and infection [4]. Gestational thrombocytopenia is a lack of aspecific underlying pathovology and it resolves spontaneously postpartum. Immune mediated thrombocytopenia as well as decompensated preeclampsia–HELLS syndrome are contraindicated and require immediate management to avoid morbidity and mortality including postpartum hemorrhage and fetal growth restriction. Differentiation from those pathological causes must be made because gestational thrombocytopenia is of paramount importance [6].

Thrombocytopenia in pregnancy is associated with varied pathophysiology. For example, immune thrombocytopenia is caused by autoantibody mediated destruction of platelets, leading to life threatening problems for mother and fetus. Immune thrombocytopenia has been a changing management situation: standard therapies include corticosteroids and intravenous immunoglobulin. In the treatment of cases resistant to these agents, new agents like thrombopoietin receptor agonists are undergoing clinical studies that increase platelet counts and minimize fetal exposure to high risk medications [7,8]. The prevalence of immune related thrombocytopenia in about 1 in 1000 pregnancies as well as the need for developing a balance between maternal safety and fetal protection make the issue important.

Other research has also recently emerged that indicates a correlation of such adverse childhood experiences with raising the odds of thrombocytopenia and other pregnancy problems. The significance of both psychosocial and environmental factors in the management of pregnant patients with thrombocytopenia is underlined by this link. Additionally, in light of the increasing realization that gestational thrombocytopenia has adverse effects on pregnancy and that it is linked to preterm birth and low birth weight, more extensive screening and control operations are advocated [3,4].

Thrombocytopenia in pregnancy has a wide variety of implications depending on the precipitating cause. Nevertheless, the causes and its proper management protocols are greatly nuanced allowing for favorable maternal and fetal outcome. The purpose of this study is to further elucidate the prevalence and its impact on pregnant females and thereby expand the existing knowledge and provide optimal pathways of care for the pregnant patients.

2. MATERIAL AND METHODS

This descriptive, cross-sectional study was conducted at the **Islamgarh Welfare Trust Hospital, Islamgarh Mirpur Azad Kashmir**, over a six-month period from March 2024 to September 2024. The study aimed to determine the frequency and associated factors of thrombocytopenia in a sample of pregnant women attending antenatal care. Based on a previously reported thrombocytopenia frequency of 17.5% among pregnant women, with a confidence level of 95% and a margin of error (d) of 5%, the sample size was calculated to be 222 participants.[11] Non-probability consecutive sampling was used to select eligible participants, who were approached consecutively until the target sample size was achieved.

Eligibility criteria for inclusion in the study consisted of pregnant women at any gestational age attending antenatal care at Civil Hospital, Bahawalpur, who provided written informed consent. Exclusion criteria included pre-existing hematologic disorders other than thrombocytopenia, the use of anticoagulant or antiplatelet therapy, and chronic liver disease or immune thrombocytopenia. Data were collected on sociodemographic characteristics and clinical history, including maternal age, gestational age, parity, hypertension, and diabetes status, using a structured questionnaire completed at the time of antenatal visits.

The primary outcome variable in the study was the presence or absence of thrombocytopenia, defined as a platelet count below 150,000/µL. Additional variables included maternal age, categorized as <25 years, 25-35 years, and >35 years; gestational age in weeks, categorized as <37 weeks (preterm) and 37-40 weeks (term); parity classified as primigravida or multigravida; hypertension status recorded as present or absent based on patient history or clinical diagnosis; and diabetes mellitus status recorded as present or absent based on patient history or clinical diagnosis.

Blood samples of approximately 3 ml were drawn from each participant using a sterile technique. Samples were collected in EDTA tubes and analyzed for platelet counts using a hematology analyzer, with all laboratory procedures conducted under standard quality control protocols to ensure accuracy and reliability of results. Data were entered and analyzed using SPSS version 24. Descriptive statistics, including frequencies and percentages, were calculated for categorical variables. The association between thrombocytopenia and maternal age, gestational age, parity, hypertension, and diabetes mellitus was assessed using the chi-square test. Stratification was performed to control for potential confounders, and a p-value of ≤0.05 was considered statistically significant.

Ethical approval for the study was obtained from the Civil Hospital Bahawalpur's Ethical Review Committee. Written informed consent was obtained from each participant after they were provided with assurances of confidentiality, anonymity, and the right to withdraw from the study at any time without affecting their medical care.

3. RESULTS

Total 222 pregnant females were selected. Mean age and mean gestational age was 30.42 ± 8.05 years and 33.81 ± 3.50 weeks.In this study of 222 pregnant females, **30.2%** (n=67) were identified with thrombocytopenia, while **69.8%** (n=155)

did not exhibit thrombocytopenia. This finding highlights that a notable portion of the sample population experienced thrombocytopenia during pregnancy. (Table 1)

Table 2 provides a detailed analysis of the frequency of thrombocytopenia among pregnant females, stratified by maternal age, gestational age, parity, hypertension, and diabetes mellitus status, with each category presented as n (%). Chi-square p-values are calculated for each variable, showing no statistically significant associations between thrombocytopenia and the stratified variables.

Among women under 25 years, thrombocytopenia was present in 16 (23.9%) of 67 cases, while 51 (76.1%) did not exhibit thrombocytopenia. In the 25–35 age group, 35 (31.5%) of 111 women had thrombocytopenia, compared to 76 (68.5%) without it. In the group aged over 35, 16 (36.4%) of 44 women had thrombocytopenia, while 28 (63.6%) did not. The chi-square test yielded a p-value of 0.340, indicating no significant association between maternal age and thrombocytopenia. These results suggest a consistent distribution of thrombocytopenia across maternal age groups, with no specific age group exhibiting a notably higher incidence.

When examining gestational age, 24 (26.4%) of the 91 women delivering before 37 weeks had thrombocytopenia, while 67 (73.6%) did not. Among those delivering between 37 and 40 weeks, 43 (32.8%) of 131 women had thrombocytopenia, with 88 (67.2%) unaffected. The p-value of 0.303 indicates that the frequency of thrombocytopenia does not differ significantly between preterm and term deliveries. This finding implies that gestational age alone may not substantially influence the incidence of thrombocytopenia in this study population.

For parity, thrombocytopenia was found in 24 (26.4%) of the 91 primigravida women, while 67 (73.6%) were unaffected. In multigravida women, 43 (32.8%) of 131 cases showed thrombocytopenia, while 88 (67.2%) did not. With a p-value of 0.303, there is no significant association between parity and thrombocytopenia, suggesting that previous pregnancy experience does not have a significant impact on thrombocytopenia risk. Both primigravida and multigravida women show similar rates of thrombocytopenia in this sample.

Among those with hypertension, thrombocytopenia was found in 13 (25.5%) of the 51 women, while 38 (74.5%) were without thrombocytopenia. In women without hypertension, 54 (31.6%) of 171 had thrombocytopenia, and 117 (68.4%) did not. The p-value of 0.406 indicates no statistically significant association between hypertension and thrombocytopenia in this population. This result implies that the presence of hypertension does not significantly affect the likelihood of thrombocytopenia in pregnant women within this study sample.

In women with diabetes mellitus, 11 (29.7%) of 37 cases showed thrombocytopenia, while 26 (70.3%) did not. Among non-diabetic women, 56 (30.3%) of 185 had thrombocytopenia, compared to 129 (69.7%) without it. The chi-square p-value of 0.948 suggests no significant association between diabetes mellitus and thrombocytopenia. This finding implies that diabetes mellitus may not be a significant factor influencing thrombocytopenia risk in pregnancy in this population.

In summary, the non-significant p-values across maternal age, gestational age, parity, hypertension, and diabetes mellitus indicate that thrombocytopenia occurs at similar frequencies across these subgroups. This lack of significant associations highlights that thrombocytopenia may be an independent condition among pregnant women, unaffected by these demographic and clinical factors within this sample. Further research could explore additional clinical factors or larger sample sizes to determine if other variables play a role in thrombocytopenia incidence in pregnancy.

Table 1: Frequency of Thrombocytopenia

Thrombocytopenia	Frequency	Percent
Yes	67	30.2%
No	155	69.8%
Total	**222**	**100.0%**

Table 2: Frequency of Thrombocytopenia Stratified by Maternal Age, Gestational Age, Parity, Hypertension, and Diabetes Mellitus

Variable	Category	Thrombocytopenia Yes (n)	Thrombocytopenia No (n)	Total (n)	p-value
Maternal Age Group	<25 years	16	51	67	0.340
	25-35 years	35	76	111	

Variable	Category	Thrombocytopenia Yes (n)	Thrombocytopenia No (n)	Total (n)	p-value
	>35 years	16	28	44	
Gestational Age Group	<37 weeks	24	67	91	0.303
	37-40 weeks	43	88	131	
Parity	Primigravida	24	67	91	0.303
	Multigravida	43	88	131	
Hypertension	Yes	13	38	51	0.406
	No	54	117	171	
Diabetes Mellitus	Yes	11	26	37	0.948
	No	56	129	185	

4. DISCUSSION

A notably higher frequency (30.2%) of thrombocytopenia was seen in this study of 222 pregnant females, compared with previously reported values (5.6%–17.5%) in similar settings, which varied widely with geographic, demographic, and clinical factors. An example is Jawad et al. that reported a prevalence of 17.5% in a similar Pakistani environment indicating that prevalence of thrombocytopenia can vary depending on region and access and practice of health care [11]. In many populations, Sridhar et al. also found from Karnataka a lower prevalence of 5.6% with most (67.2%) presenting with moderate thrombocytopenia, and GT being the primary etiology in the majority (39.3%) [12].

The non-significant associations observed between thrombocytopenia and the variables of maternal age, gestational age, parity, hypertension, and diabetes mellitus in this study reinforce findings by other researchers. Studies have shown that while thrombocytopenia commonly arises in pregnancy, it often lacks significant associations with specific maternal characteristics. This is exemplified by Nisha et al., who found a prevalence of 8.8% among Indian women and determined that thrombocytopenia primarily arose from benign conditions like GT (64.2%) and hypertensive disorders (22.1%) [13]. This study's non-significant p-values across maternal age groups (p=0.340), gestational age (p=0.303), and other modifiers suggest that thrombocytopenia in pregnancy can frequently be an incidental finding, often benign, particularly in the absence of systemic or obstetric complications.

A comparison with regional studies, such as that of Asrie et al. in Ethiopia, emphasizes the importance of identifying high-risk populations. Asrie and colleagues observed a prevalence of 8.8%, with rural residency significantly linked to increased thrombocytopenia risk (OR=4.3), underscoring how sociodemographic factors like residence and access to healthcare can influence thrombocytopenia rates [14]. Similarly, Tirago et al. identified a prevalence of 14.8% in Southern Ethiopia, where thrombocytopenia was most prevalent among women from rural areas (AOR=2.6) and was also linked to modifiable factors like smoking and anemia [15]. These findings underscore the value of routine screening, especially in rural populations, to mitigate bleeding risks associated with undiagnosed thrombocytopenia, aligning with the current study's findings of high thrombocytopenia incidence.

Park's review on thrombocytopenia management in pregnancy emphasizes the importance of differential diagnosis for thrombocytopenia types, as gestational thrombocytopenia constitutes the majority of cases and generally does not increase bleeding risk. However, other types of thrombocytopenia, such as those caused by immune or systemic factors, pose higher risks [16]. In this study, no significant association was observed between thrombocytopenia and hypertension or diabetes mellitus, suggesting that these systemic conditions alone may not contribute significantly to thrombocytopenia without specific underlying hematologic or immunologic disorders.

From a clinical perspective, the results align with Ciobanu et al., who highlight that thrombocytopenia may serve as an incidental finding in a subset of pregnancies, while for others, it indicates underlying pathologies such as preeclampsia, HELLP syndrome, or immune thrombocytopenia (ITP) [17]. The importance of routine platelet counts to screen for possible underlying conditions is particularly relevant, as Ciobanu et al. suggest, given that thrombocytopenia, when severe or secondary to a systemic disorder, can impact maternal and neonatal outcomes adversely.

The prevalence and potential severity of thrombocytopenia in pregnancy highlight the necessity for regular monitoring, as recommended by Al-Husban et al. In their study, 12% of pregnancies were affected by thrombocytopenia, primarily mild cases of GT; however, severe cases were associated with complications such as postpartum hemorrhage (PPH) and

intrauterine fetal death (IUFD) [18]. This reinforces the significance of assessing platelet levels in pregnancies identified with other risk factors to prevent adverse maternal and perinatal outcomes.

Moreover, Qurban et al. reported that in a Pakistani cohort, thrombocytopenia was found in 10.5%, 90% of which presented during the third trimester. They also note that there is greater risk with advancing gestation and that platelet counts should be observed more closely during pregnancy [19]. In contrast, Haile et al observed that other than increased maternal age, maternal HIV infection was a significant thrombocytopenia predictor in an Ethiopian cohort, indicating that underlying comorbidities should be targetedly monitored [20].

In summary, these findings are consistent with the regional and international literature, demonstrating that thrombocytopenia is a common occurrence in pregnancy, yet little influenced by demographic and pathological risk factors including age, obese or hypertensive status or parity. This relatively high prevalence observation has highlighted the need to routinely monitor platelet levels so prospective cases can continue to arise and be managed promptly. In addition, thrombocytopenia can occur without apparent risk factors and this knowledge highlights its importance in prompt prenatal monitoring as a disorder. Since thrombocytopenia can reflect either a benign or severe condition, routine platelet assessments could enhance maternal and fetal outcome by identifying and managing these problems very early on.

5. CONCLUSION

Thrombocytopenia occurred in 30.2% of the pregnant females in this study and there were no statistically significant associations of thrombocytopenia with maternal age, gestational age, parity, hypertension and diabetes mellitus. The findings of absence of association across demographic and clinical variables argue against an association between thrombocytopenia in pregnancy and these known maternal associations, and further suggest that thrombocytopenia in pregnancy could be considered an incidental finding. Thrombocytopenia was high among subjects and underscores the need for precautionary platelet monitoring during routine prenatal care not only for those with specific risk profiles but for the protection of both mother and fetus health.

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