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Incidence of Thrombocytopenia in Pregnant Females

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ABSTRACT

Introduction: Thrombocytopenia or low platelet counts are frequent hematologic findings in pregnancy, possibly affecting both the mother and her fetus. This paper aims to establish its prevalence and determinants among pregnant females in the Department of Gynaecology and Obstetrics, District Headquarter Teaching Hospital/ Gomal Medical College, Dera Ismail Khan, Pakistan. **Objectives:** To assess the frequency, causes, and outcome of thrombocytopenia in pregnant females in a tertiary Health Care teaching Institute. **Materials and Methods:** The cross-sectional observational study was conducted at Department of Gynaecology and Obstetrics, District Headquarter Teaching Hospital/ Gomal Medical College, Dera Ismail Khan, Pakistan in the duration from June, 2024 to November, 2024. Subjects: this regimen is for pregnant females between 18 and 45 years of age with thrombocytopenia that was documented to be <150,000/µL. Results of platelet counts, clinical assessment, and complications were also recorded and compared. **Results:** In 250 participants, 62 (24.8%) had thrombocytopenia. The most common cause of thrombocytopenia was Gestational thrombocytopenia (61.3 %), followed by hypertensive disorders (24.2 %) and immune thrombocytopenia (9.7%). It was evident that complications to both the mother and fetus were considerably more severe in moderate and severe forms of the disease. **Conclusion:** Pathological thrombocytopenia during pregnancy needs early recognition and management to avoid adverse outcomes.

INTRODUCTION

Thrombocytopenia, a state of low platelet count, is a significant clinical concern in pregnancy since this condition affects the health of both mother and child. Its occurrence is different according to its type, cause, and health systems, which is why research on this realizes this problem's prevalence in that population. In Pakistan especially, very few studies are available for systematically evaluating thrombocytopenia in pregnant females, which is a significant reason to research this field (1). Many non-surgical factors, including pregnancy per se, have been shown to predispose women to a lower platelet count due to physiological alterations during pregnancy, including hemodilution and hormonal changes. However, gestational thrombocytopenia, hypertensive disorders, and other causes of immune-mediated platelet destruction also fall under other causes. Looking at the practices at Department of Gynaecology and Obstetrics, District Headquarter Teaching Hospital/ Gomal Medical College, Dera Ismail Khan, Pakistan, an orientation on the differences between physiological and pathological causes of illness was stressed as paramount in diagnosis and treatment (1). Another study also pointed out the possibility of causing thrombocytopenia in pregnancy by preeclampsia, eclampsia, HELLP syndrome, and other clinical approaches that should be taken in reverberate to each of them.

In pregnancy, thrombocytopenia is related to increased maternal complications and adverse fetal outcomes in women all over the world. One study in HIV-positive pregnant women examined anemia and thrombocytopenia as everyday adversities, the latter may worsen when coexisting infections or states are presented (3). Another study done in India emphasized how the prevalence and causes of PPH varied, while idiopathic and gestational factors were common in some

settings (4). Another research study conducted in Nigeria described a relatively high level of thrombocytopenia in pregnant women attending a tertiary health institution and associated it with nutritional complications and epidemical diseases (5). These conclusions suggest the complexity of thrombocytopenia during pregnancy and the dependent solutions from the regional and clinical settings.

The essential therapies for thrombocytopenia during pregnancy have not been explained adequately. For instance, immune thrombocytopenia (ITP) calls for corticosteroids and intravenous immunoglobulins, blood platelet transfusion, and splenectomy in severe cases. Thrombopoietin receptor agonists like romiplostim, which has been recently attacked, appear promising for managing ITP during pregnancy, but their safety and outcome profiles are subjects of research (6). In Rahim Yar Khan, Pakistan, a study was carried out to determine the prevalence and distribution of thrombocytopenia during pregnancy (7). Congenital and secondary thrombocytopenia constitute a diagnostic dilemma in particular ways. For example, it is interesting that genetic thrombotic thrombocytopenic purpura is a relatively rare condition that calls for appropriate treatment to avoid dangerous outcomes. Research in the EU and North America has provided helpful information on the annual rate and control of acute attacks in such disorders. Nevertheless, the literature available from South Asia is meager. Another study in Delhi insisted on identifying other specific reasons for thrombocytopenia – infections, autoimmune processes, and hematologic malignancies in particular (4).

It is established that hypertensive disorders come among the top positions of diseases that provoke thrombocytopenia in pregnant females if they are more than 20 weeks pregnant. A study in the District Headquarter Teaching Hospital/ Gomal Medical College, Dera Ismail Khan, Pakistan highlighted that low platelet level is a frequently observed feature of preeclampsia, so platelet count should be checked often, and if dropped, the expectant mother should be immediately treated. Secondly, idiopathic thrombocytopenic purpura has some peculiarities in management in pregnancy because of its variability of clinical course and possible influences on the fetus. Another review revealed present-day challenges in managing such instances, focusing on teamwork and consultation for custom fit management measures (11). The epidemiology of thrombocytopenia also encompasses other conditions, although rate and grave. For example, cerebral venous sinus thrombosis has been associated with thrombocytopenia in some groups. Most reported in Western countries, these associations draw awareness of the need for complete risk evaluation and immediate intervention to prevent such consequences (14). Also, heparin-induced thrombocytopenia is quite a rare occurrence in pregnancy, which presents significant management issues because of the few anticoagulant options and the threat of thrombosis (15).

The investigations conducted in tertiary care hospitals in Pakistan have shown a pressing need to improve the diagnosis and understanding of thrombocytopenia among caregivers (7). Collaborative research to enhance the available data and incorporate platelet function tests and molecular biology will help optimize patient care. Lastly, the case of pregnant females having low platelet count is another area of research in maternal health that has important revelation for practice and policy. These differences in prevalence, causes, and prognosis imply the need for detailed research concerning different contexts to inform intervention approaches. Using the knowledge derived from the current literature and developing powerful diagnostic and therapeutic methods, the healthcare systems worldwide, including Pakistan, would be in a good position to overcome these problematic possible complications existing in pregnant groups.

Objective

The study aims to find out how often pregnant females in Pakistan suffer from thrombocytopenia, the reasons behind it, and how this condition affects pregnant females and fetuses in terms of clinical outcomes so that evidence can be used to diagnose and manage thrombocytopenia and enhance maternal and fetal health.

MATERIALS AND METHODS

Study Design: This cross-sectional analytic epidemiologic study aimed to establish the journey and present features of thrombocytopenia in pregnant females and its outcomes.

Study setting: The study was conducted at Department of Gynaecology and Obstetrics, District Headquarter Teaching Hospital/ Gomal Medical College, Dera Ismail Khan, Pakistan in the duration from June, 2024 to November, 2024

Duration of the study: The research was conducted from June, 2024 to November, 2024**.**

Inclusion Criteria

The sacrifice in the present study was pregnant females aged between 18 and 45 years and in any of the tri-semesters of pregnancy. Patients had to come to the obstetrics and gynecology department with platelet counts of below 150,000/µL to qualify for participation in the study. Furthermore, all participants completed an informed consent form as a participant precondition to signify their willingness to part-take and understand the study's purpose and processes.

Exclusion Criteria

The following criteria excluded all irrelevant data that may contaminate the results. Males and females with hematological diseases, including leukemia or aplastic

anemia, were excluded to eliminate interference. Similarly, patients receiving chemotherapy or other immunosuppressive treatments were excluded mainly due to the effects on platelet numbers. Some participants had missing medical records, some refused to participate in the study, and they were excluded to ensure accurate data were obtained. Lastly, females with other concurrent chronic diseases unrelated to thrombocytopenia were excluded to enhance the demarcation of thrombocytopenia among pregnant females.

METHODS

Samples were obtained from pregnant females attending Department of Gynaecology and Obstetrics, District Headquarter Teaching Hospital/ Gomal Medical College, Dera Ismail Khan, Pakistan. The patients were investigated for underlying predisposing factors to thrombocytopenia through history and a clinical examination using a standard protocol. Venous blood samples were collected for complete blood count (CBC) on a hematologic analyzer, and a platelet count of less than 150 000/µL was considered thrombocytopenia. Liver function tests (LFTs), renal function tests (RFTs), and coagulation profiles, as determined by the medical practitioner or protocol, were also analyzed when necessary. Those were grouped by the cause: gestational thrombocytopenia, hypertension, or ITP. Samples were collected on a structured proforma, and patient identification was maintained throughout. Analysis of the data obtained was conducted using SPSS 25 software. Frequency and frequency percentage were used to determine the demographic and clinical characteristics of the clients, and cross-tabulation was used to analyze how thrombocytopenia affected maternal-fetal outcomes. The study was approved by the hospital's research committee involved, and participants provided written informed consent.

RESULTS

Two hundred fifty pregnant females were enrolled in the study, with a mean age of 29 years (18–45 years). Among them, sixty-two (24.8%) were diagnosed with thrombocytopenia, defined as platelet count less than 150000/µL. Thrombocytopenia was ranked mildly if its range was between 100000 and 149000/µL, moderately if between 50000 and 99999/µL, and severely if below 50000/µL. Mild thrombocytopenia was the most common, diagnosed in 40 (64.5%) patients. The decrease in platelet count was mild, moderate, and severe in 18 and 4 patients, respectively.

Table 1

Distribution of Thrombocytopenia by Severity

Severity	Count (n)	Percentage (%)
Mild (100–149 x10³/µL)	40	64.5
Moderate (50–99 x10³/µL)	18	29.0
Severe (<50 x10³/µL)	4	6.5
Total	62	100.0

The most common cause of thrombocytopenia, which was observed in 38 patients, was gestational thrombocytopenia, while hypertensive disorders, such as preeclampsia and HELLP syndrome, were detected in 15 patients. Other causes of thrombocytopenia, including infections and thrombocytopenia induced by different drugs, were seen in 3 (4.8 percent) study patients.

Table 2

Etiology of Thrombocytopenia

Cause	Count (n)	Percentage (%)
Gestational Thrombocytopenia	38	61.3
Hypertensive Disorders	15	24.2
Immune Thrombocytopenia (ITP)	6	9.7
Other Causes	3	4.8
Total	62	100.0

Complications during maternal thrombocytopenia were antepartum hemorrhage in 10 (16.1%) cases and postpartum hemorrhage in 8 (12.9%) cases. Fetal complications were preterm birth in 12(19.4%) and low birth weight in 15(24.2%) cases. In this study, the complication rate was higher among the patients with moderate to severe thrombocytopenia ($p < 0.05$).

Table 3

Maternal and Fetal Complications

Complication	Count (n)	Percentage (%)
Antepartum Hemorrhage	10	16.1
Postpartum Hemorrhage	8	12.9
Preterm Birth	12	19.4
Low Birth Weight	15	24.2
Total Cases with Complications	45	72.6

Lastly, gestational thrombocytopenia remained the most prevalent type of low platelet count in pregnancy. These data are relevant because moderate and severe thrombocytopenia detected during pregnancy requires close observation and intervention to reduce maternal and fetal morbidity.

DISCUSSION

Pregnancy-associated thrombocytopenia is a complex issue and should be approached cautiously because of the possibility of worse outcomes for either the mother or the fetus. This study evaluated an incidence of 24.8 percent of thrombocytopenia in pregnant women attending District Headquarter Teaching Hospital/ Gomal Medical College, Dera Ismail Khan, Pakistan, gestational thrombocytopenia being the most prevalent cause. These findings corroborate earlier studies performed in other settings, in which gestational thrombocytopenia comprised the vast majority of instances and appeared largely innocuous in most cases (1, 2). However, the work also emphasizes the clinical relevance of finding such pathological causes as

hypertensive disorders and immune-mediated thrombocytopenia, which also increase the risk of complications (3, 7).

It is worth noting that mild thrombocytopenia was high in the present study at 64.5%, highlighting the importance of platelet count checkups during pregnancy. A mild degree of thrombocytopenia is usually innocuous, moderate to severe thrombocytopenia has a high propensity for serious complications like hemorrhage and adverse perinatal outcomes (5,8). For instance, 29% of cases had moderate thrombocytopenia, and 6.5% of cases had severe thrombocytopenia, causing increased maternal and fetal complications. These observations align with other research in low- and middle-income countries where similar trends emphasize early detection and treatment (4, 5).

Pregnancy-induced hypertension, preeclampsia, and HELLP syndrome were the second most prevalent cause of thrombocytopenia in this study, at 24.2%. These conditions are adverse and known to produce serious consequences on maternal and fetal health, such as preterm birth, low birth weight, and perinatal mortality (10). Similar observations have been made in previous Pakistani and regional research on trends of hypertensive disorders among pregnant women (7). This correlation is because thrombocytopenia develops through platelet consumption and destruction by endothelial damage and systemic inflammation, necessitating proper antenatal care and blood pressure control (3, 6).

This study shows that immune thrombocytopenia (ITP) was responsible for 9.7% of the cases, and managing such patients during pregnancy is challenging. Motor characteristics and ITP course differ from other pathologies, and fetal platelet counts may be significantly affected. In severe cases, individual regimes are currently prescribed to their patients, comprising corticosteroids, intravenous immunoglobulins, and thrombopoietin receptor agonists (6, 11). Some form of management, like the current romiplostim, has proved to be a success, although, writes Lyman, fear persists in the use of the drug during pregnancy. This paper underscores the importance of a holistic care model in improving the prognosis for both the mother and the baby in such instances.

It also reports the direct medical concern, which is attributed to maternal and fetal complications due to thrombocytopenia. The provision of antepartum and postpartum hemorrhage ranked 9th among the indicators, representing 16.1% and 12.9%, respectively, of the cases. These were in line with previous studies that suggest a direct correlation between low platelet count and bleeding risks, mainly where the scores are moderate to severe (8, 10). Newborn morbidities, preterm birth (19.4 %), and low birth weight (24.2%) were also significantly high among this population, suggesting the influence of maternal thrombocytopenia on the newborn. These findings are consistent with other studies worldwide, showing that thrombocytopenia increases the risk of adverse perinatal outcomes (5, 8).

The authors of this study determined that despite being the most common, gestational thrombocytopenia does not lead to serious complications for either the mother or the fetus. This agrees with previous studies that describe gestational thrombocytopenia as a relatively innocuous condition with favorable outcomes (1, 2). Nevertheless, a distinction between gestational thrombocytopenia and other causes is essential, as pathological processes, including hypertensive disorders and ITP, should be managed differently to avoid complications (7). A detailed clinical assessment, specific laboratory investigations, and imaging studies are used to differentiate the etiologies mentioned above.

The implications of the findings of this study for clinical practice and public health are discussed below. Firstly, they will stress the importance of reaffirming effective aneuploidy screening programs to detect thrombocytopenia in pregnant females. This will enhance early recognition of the disease causes and improve the maternal and fetal platelet count measurements, pregnant women should have their platelet count checked frequently (1, 5). Secondly, case reports indicate that optimal care of thrombocytopenia should involve obstetricians, hematologists, and neonatologists (6, 7). Thirdly, the study shows that researchers should focus on public health efforts to reduce modifiable risk factors, including hypertensive disorders, by enhancing antenatal care and health promotion interventions (10).

However, this research has several limitations, as discussed below. Due to the single-center design, the results should be cautiously generalized to other centers with differing population characteristics and healthcare practices. The study only relied on clinical and laboratory data, which may fail to identify some causes of thrombocytopenia, including genetic disorders or subclinical infections (8). Future studies should be conducted in other centers to confirm these observations and investigate the application of novel diagnostic and treatment techniques to enhance the prognosis for pregnant women with thrombocytopenia (9, 11). Lastly, this study aims to establish a register of the occurrence, origin, and related complications of thrombocytopenia among pregnant women in Pakistan. The results show that gestational thrombocytopenia is the most common and relatively benign condition. Nevertheless, pathological causes, including hypertensive disorders and ITP, are associated with various severe complications. When antenatal care is enhanced, and management of thrombocytopenia in pregnancy relies on the best practices, there will be reduced burden and lesions on the health of the mother and the newborn.

CONCLUSION

It shows that thrombocytopenia is quite common in pregnant females and is seen in 24.8% in District Headquarter Teaching Hospital/ Gomal Medical College, Dera Ismail Khan, Pakistan. Gestational thrombocytopenia becomes the leading cause, usually asymptomatic, with fewer complications. Nevertheless, hypertensive disorders and immune thrombocytopenia were the leading pathological conditions that still presented a life-threatening danger to both the mother and child. Adverse outcomes, including maternal hemorrhage, preterm birth, and low birth weight, were increased in women with moderate to severe thrombocytopenia. The results of the presented study emphasize the necessity of platelet count assessment, its early detection, and individualized care in pregnant women. It is essential to have the obstetric care team, hematologist, and neonatology team provide proper care. Furthermore, multicenter studies must be undertaken on a more significant scale to replicate these findings and develop new diagnostic and therapeutic approaches regarding thrombocytopenia in pregnancy.

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