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RESEARCH ARTICLE

HEMATOLOGICAL CHARACTERISTICS OF PREGNANT WOMEN IN PORT HARCOURT: IMPLICATIONS FOR MATERNAL HEALTH

Amadi Obi
Department of Medical Laboratory Science, Rivers State University, Nkpolu, Port Harcourt, Nigeria

Abstract: This study investigates the hematological characteristics of pregnant women attending antenatal clinics in Port Harcourt, Nigeria, with a focus on understanding how these parameters may influence maternal health outcomes. A total of 300 pregnant women were recruited for this cross-sectional study, and their hematological profiles were analyzed, including parameters such as hemoglobin concentration, packed cell volume, red blood cell count, white blood cell count, and platelet count. The findings revealed that the average hemoglobin concentration was significantly lower than the standard reference range, indicating a high prevalence of anemia among the participants. Additionally, variations in white blood cell and platelet counts were observed, which may reflect the physiological changes during pregnancy and the potential risk for pregnancy-related complications. The study highlights the critical need for regular hematological assessments in pregnant women to identify and manage potential health issues early. These findings underscore the importance of integrating comprehensive maternal health services, including nutritional support and anemia management, into antenatal care programs in Port Harcourt to enhance maternal and fetal health outcomes.

Key words: Hematological Characteristics, Pregnant Women, Maternal Health, Anemia, Port Harcourt, Antenatal Care, Hemoglobin Concentration.

INTRODUCTION

Quality Pregnancy is a critical period characterized by profound physiological changes that significantly impact a woman's hematological profile. During this time, the body undergoes adaptations to support the growing fetus, including alterations in blood volume, composition, and the production of various hematological components. These changes are essential for ensuring adequate oxygen delivery and nutrient supply to both the mother and the fetus, as well as for preparing the mother's body for childbirth and breastfeeding.

In many developing countries, including Nigeria, maternal health remains a pressing public health issue, with significant implications for both maternal and neonatal morbidity and mortality. Hematological disorders, particularly anemia, are prevalent during pregnancy and can lead to serious complications if not addressed adequately. The World Health Organization (WHO) defines anemia in pregnancy as a hemoglobin concentration of less than 11 g/dL, with an estimated prevalence of 38% among pregnant women globally. In Nigeria, studies have reported alarming rates of anemia among pregnant women, often attributed to factors such as nutritional deficiencies, parasitic infections, and socio-economic challenges.

Port Harcourt, a major city in Nigeria, has a diverse population with varying socio-

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economic backgrounds, which may influence the health status of pregnant women. Despite the importance of monitoring hematological parameters during pregnancy, there is a scarcity of localized data on the hematological profiles of pregnant women in this region. Understanding the hematological characteristics of pregnant women is crucial for identifying those at risk of complications and for implementing targeted interventions.

This study aims to investigate the hematological characteristics of pregnant women attending antenatal clinics in Port Harcourt. Specifically, it seeks to analyze key hematological parameters, including hemoglobin concentration, packed cell volume, red blood cell count, white blood cell count, and platelet count. By examining these parameters, the study aims to highlight the implications of hematological profiles for maternal health and to underscore the importance of regular monitoring and management of hematological conditions in pregnant women. Ultimately, the findings from this research will contribute to the body of knowledge necessary for improving maternal healthcare services and outcomes in Port Harcourt and similar contexts across Nigeria.

METHOD

This cross-sectional study was conducted to assess the hematological characteristics of pregnant women attending antenatal clinics in Port Harcourt, Nigeria. The study design involved participant selection, data collection, laboratory analysis, and statistical evaluation, ensuring a comprehensive understanding of the hematological parameters associated with pregnancy.

Participant Selection

The study was conducted from January to June 2023, involving pregnant women aged 18 years and above who were attending antenatal clinics at selected healthcare facilities in Port Harcourt. A sample size of 300 participants was calculated using a standard sample size determination formula, considering a confidence level of 95% and a margin of error of 5%. Participants were recruited using systematic sampling techniques, where every third pregnant woman meeting the inclusion criteria was approached for participation. Women with known hematological disorders, chronic illnesses, or those receiving blood transfusions were excluded from the study to minimize confounding factors.

Data Collection

A structured questionnaire was administered to each participant to collect socio-demographic information, including age, gestational age, educational background, and dietary habits. Additionally, details regarding previous pregnancies and any history of anemia or related health issues were documented. Following the questionnaire, blood samples were collected for hematological analysis. Venous blood was drawn from each participant using sterile techniques and collected into ethylenediaminetetraacetic acid (EDTA) tubes to prevent clotting.

Laboratory Analysis

The blood samples were transported to a local laboratory for analysis within two hours of collection. Standard hematological parameters were measured using an automated hematology analyzer. These parameters included hemoglobin concentration (g/dL), packed cell volume (%), red blood cell count (million cells/μL), white blood cell count (thousand cells/μL), and platelet count (thousand cells/μL). Hemoglobin levels were classified according to WHO standards, with values less than 11 g/dL indicating anemia. The laboratory protocols followed were in accordance with established quality control

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measures to ensure the accuracy and reliability of the results.

Data Analysis

Statistical analysis was performed using SPSS version 25.0 (Statistical Package for the Social Sciences). Descriptive statistics, including means and standard deviations, were computed for all hematological parameters. The prevalence of anemia and other hematological abnormalities was calculated as a percentage of the total sample. Inferential statistics, including independent t-tests and chi-square tests, were utilized to compare hematological parameters across different age groups and gestational ages. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations

Ethical approval for the study was obtained from the Institutional Review Board of the participating healthcare facilities. Informed consent was obtained from all participants prior to their inclusion in the study, ensuring they were aware of the purpose of the research, the procedures involved, and their right to withdraw at any time without consequences. Confidentiality was maintained throughout the study, with data stored securely and used solely for research purposes.

This methodological framework provides a rigorous approach to assessing the hematological characteristics of pregnant women in Port Harcourt, contributing to a better understanding of maternal health issues in the region.

RESULTS

The study analyzed the hematological characteristics of 300 pregnant women attending antenatal clinics in Port Harcourt. The findings are summarized below, highlighting key hematological parameters and their implications for maternal health.

Demographic Characteristics

The mean age of participants was 28.5 years (± 5.7), with the majority (55%) falling within the 25-34 years age group. Most participants were in their second trimester of pregnancy (58%), followed by the first trimester (28%) and third trimester (14%). The educational background varied, with 40% of participants having completed secondary education and 30% having attained tertiary education.

Hematological Parameters

The mean hematological parameters observed in the study were as follows:

Hemoglobin concentration: 10.2 g/dL (± 1.5), with 68% of participants classified as anemic (hemoglobin < 11 g/dL).

Packed cell volume (PCV): 32.1% (± 4.1), with significant proportions of participants showing reduced values.

Red blood cell count: 4.1 million cells/µL (± 0.8), indicating mild to moderate reductions in some cases.

White blood cell count: 8.5 thousand cells/µL (± 2.0), within normal ranges but varied significantly among participants.

Platelet count: 230 thousand cells/µL (± 50), which generally fell within the normal range but had outliers indicating thrombocytopenia in a few cases.

Anemia Prevalence

The prevalence of anemia was notably high, with a higher incidence among participants in the lower age brackets (18-24 years). Additionally, women in the third trimester demonstrated a greater likelihood of anemia compared to those in the first and second trimesters, suggesting a potential increased nutritional demand as pregnancy progresses.

DISCUSSION

The results of this study highlight a significant concern regarding the hematological health of pregnant women in Port Harcourt. The high prevalence of anemia (68%) among participants

underscores a pressing public health issue, aligning with existing literature that points to nutritional deficiencies and socio-economic challenges as contributing factors. Anemia in pregnancy is associated with adverse outcomes, including preterm birth, low birth weight, and increased maternal morbidity and mortality.

The observed mean hemoglobin concentration of 10.2 g/dL falls below the WHO's recommended threshold, indicating a widespread need for effective anemia management strategies in this population. The findings suggest that dietary interventions, such as the promotion of iron-rich foods and iron supplementation, should be integrated into antenatal care programs to address the nutritional needs of pregnant women.

Moreover, the variations in white blood cell and platelet counts may reflect the physiological adaptations occurring during pregnancy, such as increased immune response and altered hemostatic mechanisms. However, the occurrence of thrombocytopenia in a subset of participants raises concerns about potential underlying conditions that warrant further investigation.

The demographic analysis reveals that younger women and those in the later stages of pregnancy are particularly vulnerable to anemia, emphasizing the importance of targeted education and intervention strategies aimed at these groups. Enhanced antenatal education regarding the significance of regular hematological assessments and nutritional supplementation could play a crucial role in improving maternal health outcomes.

CONCLUSION

This study elucidates the hematological characteristics of pregnant women in Port Harcourt, highlighting the critical issue of anemia and its potential implications for maternal health. The high prevalence of anemia among the study population calls for urgent attention from healthcare providers and policymakers to implement effective interventions aimed at improving maternal nutritional status and overall health.

Regular hematological monitoring during antenatal visits is essential for early detection and management of anemia and other hematological disorders. Comprehensive maternal health programs that integrate nutritional education, routine screening, and timely interventions can significantly improve health outcomes for pregnant women and their infants. Further research is recommended to explore the underlying causes of anemia in this population and to evaluate the effectiveness of specific interventions in reducing its prevalence. By prioritizing maternal health and addressing the challenges identified in this study, stakeholders can contribute to enhancing the quality of maternal care and improving the health of future generations in Port Harcourt, Nigeria.

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