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PREVALENCE AND HEMATOLOGICAL PROFILES OF PREGNANCY ANEMIA: EXTENDED CROSS-SECTIONAL ANALYSIS IN A TERTIARY CARE CENTER IN TASHKENT

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Abstract

Background: Gestational anemia is a significant public health problem globally. It contributes significantly to maternal morbidity and adverse fetal issues through bloodied oxygen- carrying capacity, endothelial dysfunction, and increased motherly metabolic demand.

Objective: to study the prevalence of anemia in pregnant women in the Tashkent region and conduct a comparative analysis of hematological parameters in pregnant women.

Methods: Cross-sectional study was conducted among 58 pregnant women attending Maternity Complex No.3, Tashkent Medical Academy. Demographic data, clinical history, and hematological parameters were collected. CBC included hemoglobin (Hb), RBC indicators (MCV, MCH, MCHC), hematocrit, and RDW- CV. Anemia was diagnosed if Hb was< 110 g/L. Chi-square and Pearson correlation tests were applied. Results: 45 out of 58 cases (77.6%) were anemic. Multigravida women were anemic (75.6, p=0.021). All 10 preeclamptic cases were anemic (p=0.006). Anemic women had dropped Hb, MCV, MCH, MCHC, hematocrit, and increased RDW- CV. No correlation between age and Hb (r=0.07, p=0.63).

Conclusion: Gestational anemia is largely current among pregnant women recruited in study and is significantly associated with multigravidity and preeclampsia. These findings emphasize the necessity for routine prenatal webbing, early nutrition, and careful clinical surveillance.

Keywords: Pregnancy anemia, Hematologic parameters, Multigravida, Preeclampsia, RDW-CV, Maternal health.

Introduction

Anemia is one of the most frequent medical gestation- related complications in the world [9, 20]. The World Health Organization has defined anemia as a hemoglobin level less than 110 g/L in pregnant women [1, 6, 22]. Anemia affects over 40% of pregnant women globally, with South

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Asia and Sub-Saharan Africa having the highest percentages [5, 10, 21]. There is little regional data from Uzbekistan regarding anemia in pregnancy, but suspicion is high in clinical settings [19]. Pregnancy anemia is aggravated with serious maternal and fetal morbidity in the form of preterm birth, low birth weight, and death [3, 17, 18]. The primary etiology of anemia remains iron deficiency, followed by folate or B12 deficiency, anemia of chronic disease, and hemoglobinopathies [4, 11, 14]. Pregnancy demands more hematologic adaptation in the form of increased blood volume and extra iron requirement [2, 16].

In settings of inadequate nutrition and healthcare access, these physiological requirements are often not satisfied, and as a consequence, high prevalence rates of anemia are detected [8, 12, 15]. Risk factors include poor diet, multigravidity, short interpregnancy interval, and hypertensive disorder [7, 13]. The ideal of this study is to determine the frequence of anemia among pregnant women within a tertiary hospital in Uzbekistan and to identify affiliated hematologic patterns as well as clinical factors [19].

Materials and Methods

Study Design and Setting: this cross-sectional descriptive study was conducted between December, 2024 and March ,2025 at Maternity Complex No. 3 in Tashkent. It is a tertiary care center with routine and high-risk pregnancy care in urban and peri-urban settings.

Participants: Fifty-eight pregnant women aged 18-35 years were enrolled in this study.

Inclusion criteria: Single pregnancy, gestational age >12 weeks and availability of complete blood count

Exclusion criteria: Known hematological disorders, recent transfusion, active infection or acute bleeding

Data Collection: After informed consent, a preprepared questionnaire gathered demographic data, history of past pregnancy, and complaints. Blood pressure and urinalysis were measured to diagnose preeclampsia. Automatic hematology analyzers were used to analyze the blood.

Parameters of Hematological Measurement:

- Hemoglobin (Hb, g/L);
- Count RBC ($\times 10^{12}$/L);
- Mean Corpuscular Volume (MCV, fL);
- Mean Corpuscular Hemoglobin (MCH, pg);
- Mean Corpuscular Hemoglobin Concentration (MCHC, g/L);
- Red Cell Distribution Width (RDW-CV, %);
- Hematocrit (%);
- Anemia was diagnosed by the criterion of Hb <110 g/L.

Statistical Analysis: StataV17 was used for analysis. Categorical variables were compared using Chi-square tests. Pearson correlation was used to evaluate correlation between hemoglobin level and maternal age. A p-value of less than 0.05 was considered statistically significant.

Results

Prevalence of Anemia: 45 (77.6%) out of 58 women were anemic. Mean hemoglobin in anemic subjects was 91.5±6.8 g/L compared to 117.8±4.9 g/L in non-anemic subjects ($p<0.001$).

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Demographic and Clinical Associations: Multigravidity was reported in 34 (75.6%) anemic patients compared to 5 (38.5%) non-anemic patients (p=0.021). Preeclampsia was diagnosed in 10 women—all from the anemic group (p=0.006).

Table 1. Demographics and Clinical Characteristics

Variable	Anemic (n=45)	Non-Anemic (n=13)	p-value
Mean Maternal Age (years)	27.3±4.2	26.8±3.9	0.49
Multigravida (%)	34 (75.6%)	5 (38.5%)	0.021
Preeclampsia (%)	10 (22.2%)	0 (0%)	0.006

Hematological Findings: Table 2 indicates the hematological findings obtained from patient data.

Table 2. Hematological Indices

Parameter	Anemic (Mean ± SD)(n=45)	Non-Anemic (Mean ± SD)	p-value
Hemoglobin (g/L)	90.4±6.7	11.8±3.9	<0.001
RBC (×10¹²/L)	3.45±0.4	4.01±0.5	<0.001
MCV (fL)	82.4±4.6	85.1±3.8	0.042
MCH (pg)	26.5±2.3	28.3±1.9	0.039
MCHC (g/L)	31.4±1.9	32.6±1.3	0.037
RDW-CV (%)	16.7±2.1	13.2±1.4	<0.001
Hematocrit (%)	27.1±3.2	36.8±2.9	<0.001

Correlation Analysis: No correlation between maternal age and Hb was observed (r=0.07, p=0.63) .

Discussion

The anemia prevalence (77.6%) in this group is significantly higher than the global average. These results indicate a pressing need for enhanced antenatal care, particularly among multigravida women, who are at higher physiological risk of iron deficiency.

All preeclamptic women in this series were anemic, suggesting a possible pathophysiologic interaction between anemia and hypertensive disorders. Decreased oxygen delivery due to anemia could enhance placental hypoxia, which would increase endothelial dysfunction in preeclampsia.

Hematological profiles among anemic subjects were considerably lower in Hb, MCV, MCH, and hematocrit but with extremely elevated RDW-CV—characteristic of progressive iron deficiency or mixed-type anemia. Although certain iron biomarkers were not measured, the pattern is characteristic of early-stage or combined nutrient deficiency anemia.

The absence of high correlation between hemoglobin and age supports the assumption that age itself is not a risk determinant for anemia. Instead, clinical factors such as parity, nutritional status, and comorbidities should guide targeted screening and supplementation.

Conclusion

This study reveals a remarkably high prevalence of anemia in pregnant women. Anemia is both significantly associated with multigravidity and preeclampsia. These findings all emphasize the

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necessity of regular hematological screening at antenatal check-up, selective nutritional treatment, and heightened monitoring of hypertensive conditions in pregnancy. Addition of low-cost diagnostics, micronutrient supplementation, and education could greatly reduce anemia-related morbidity in this population.

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