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Original article

High Prevalence of Iron Deficiency Anaemia Among Pregnant Women in District Peshawar: A Cross-Sectional Study

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Abstract: Anaemia among pregnant women remains a pressing public health concern, especially in tropical developing nations. Having too few healthy red blood cells can cause extreme fatigue, weakness, and shortness of breath for expectant mothers. This study aimed to determine the prevalence of and risk factors associated with iron-deficiency anaemia amidst expectant mothers in Peshawar District, Pakistan. A cross-sectional research design was employed, selecting 100 pregnant patients from Shah Medical Center in Peshawar using proportional-to-size sampling. Clinicians drew 4 ml of venous blood from participants to clinically assess anaemic status. The investigators sought to shed light on how widespread deficient iron levels have become for local mothers-to-be and what characteristics might predispose women to this challenge through statistical analysis of the collected medical data. Among 100 samples, 25 showed to be anaemic and the parameters were counted lower than normal. As per the World Health Organization, the criterions for anaemia in pregnancy were applied and serum ferritin < 20µg/l was the cut-off point for iron deficiency. Data regarding risk factors was gathered using pre-designed questionnaires. The prevalence of iron-deficiency anaemia in pregnant women was 22% while most of the cases of anaemia were mild. In this research, the risk factors accompanying anaemia included the period of gestation, poor advice, iron pills intake during antenatal, socioeconomic status, and poor hygiene condition. The conclusion of this study is that the high prevalence of iron-deficiency anaemia among pregnant women can be averted if the prevention includes giving iron supplements, proper diagnosis of gestation, and health education.

Keywords: Disease Control, anaemia, red blood cells, WHO, EDTA, leucocyte, and serum ferritin.

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Introduction

Pregnant women are particularly susceptible to Iron deficiency; the WHO regimen is 38% (1). This may result to anaemia and various complications that may also affect the mother and her unborn baby (2). Iron deficiency is lack of iron in the body, blood and a state of anaemia which is the reduced manufacture of red blood corpuscles (3). Anaemia is detected by low haemoglobin levels, 100 gm/L for adult women who are not pregnant and 110 gm/L and for men and older teenagers aged fifteen and older respectively as estimated by the WHO (4). Iron deficiency anemia is a public health issue of significant proportion in India (5). It covers approximately one-fifth of maternal mortalities and another half of maternal mortalities are related to it (6). The causes are - insufficient oral iron intake, low bioavailability of iron, raised requirement during pregnancy and lactation, timing of cord severance, and high rates of infections in children (7). Be aware of the key laboratory analyses used to diagnose iron deficiency and anemia that are hemoglobin, red blood cell counts and serum ferritin(8). The low stores of iron are depicted when SF is below 30 g/L and inflammation is checked by estimating C-reactive protein. Additional tests are done if the ferritin is greater than 30 g/Hb levels are tested every trimester, thus this makes [SF] the most preferred test (9). Pregnancy anemia has frequent background in

extension and is researched in multiple etiologies such as iron deficiency anemia, aplastic anemia, disorder of globulin production, folic acidemia, and vitamin B12 acidemia (10). The most common form is iron deficiency that can result in poor pregnancy outcomes (11). The purpose of the current study was twofold; first, to determine the prevalence of iron-deficiency anemia in pregnant women of District Peshawar; second, to determine the factors that are associated with the above health condition.

Materials and Methods

One hundred blood samples from pregnant women in the vibrant metropolis of Peshawar, ages 18 to 45, were carefully gathered. Shah Medical Center and Mubarak Medical and Diagnostic Center provided these priceless specimens, guaranteeing a thorough and representative dataset. The blood samples were meticulously extracted and placed in EDTA and Gel tubes in preparation for a thorough laboratory analysis. High-resolution microscopes, a sophisticated Hematology Analyzer, and a precise Chemistry Analyzer were among the sophisticated instruments used in the study, which looked at vital metrics such serum ferritin levels, white blood cell counts, and haemoglobin levels. Each sample underwent a thorough and stringent evaluation, which revealed important details about the subjects' hematological and biochemical conditions. Statistical analyses confirmed the findings' robustness and dependability by adhering to strict scientific criteria, with a significance threshold set at a p-value less than 0.05. The meticulous and cutting-edge methodology of this study made significant additions to our knowledge of iron deficiency anaemia in Peshawar pregnant women.

RESULTS

After processing all the samples, we will present figures displaying the statistical and graphical analysis of hemoglobin levels in pregnant women based on age-wise distribution. This will include the mean value for the statistical analysis of HGB in pregnant women according to age-wise distribution. (Figure 1).

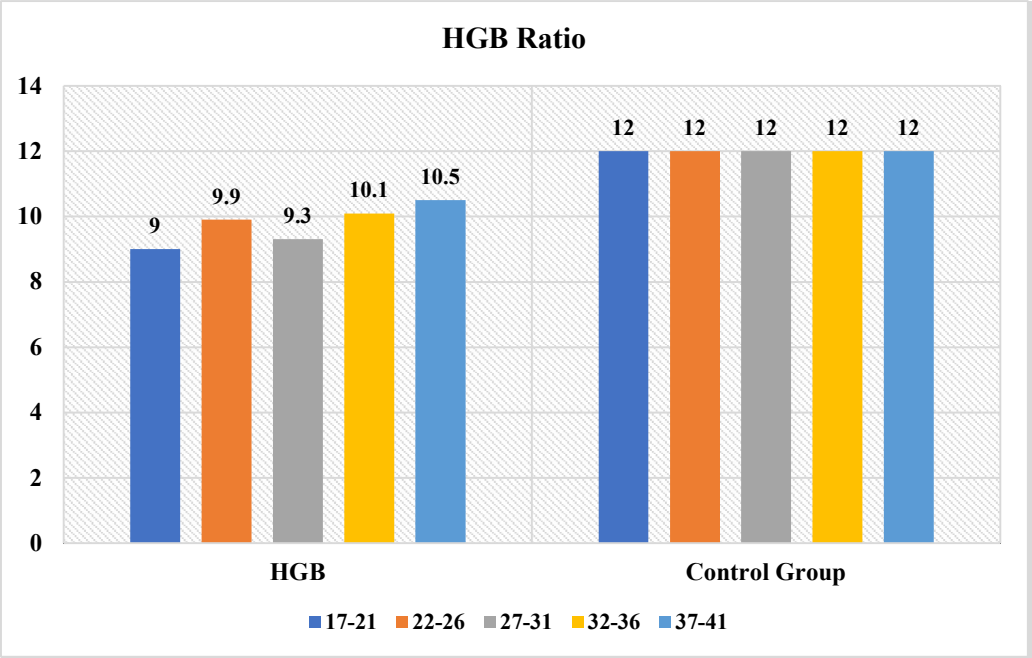

Figure 1. Showing graphical analysis of HGB in pregnant women according to age wise distribution.

Showing the statistical and graphical analysis of red blood cells in pregnant women based on age-wise distribution. Displaying the statistical analysis of RBC in pregnant women according to age-wise distribution (**Figure. 2**).

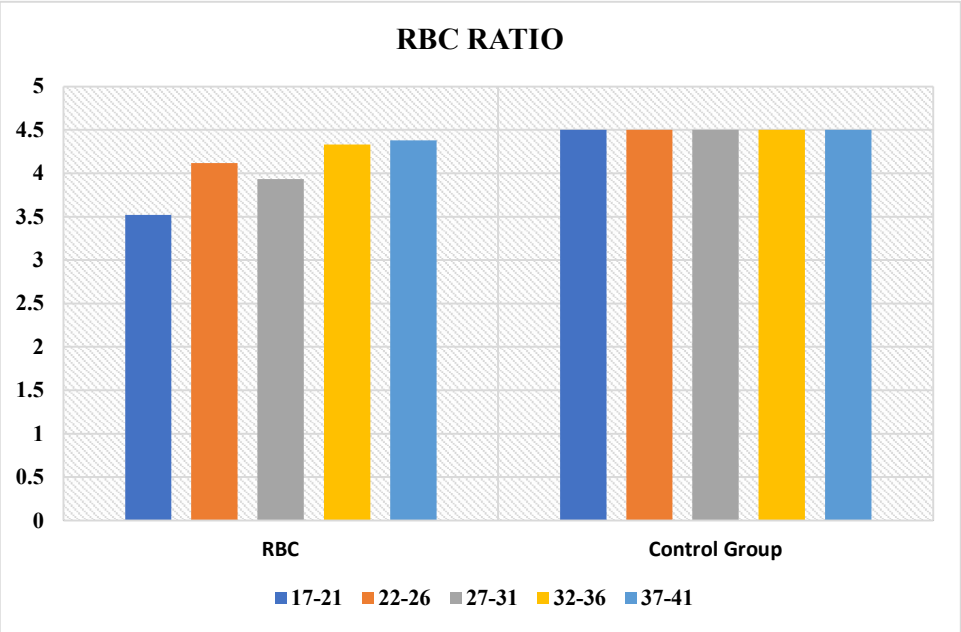

Figure..2 Showing graphical analysis of RBC in pregnant women according to age-wise distribution.

Statistical and graphical analysis of Mean Corpuscular Volume (MCV) in pregnant women based on age distribution is depicted in (**Figure. 3).**

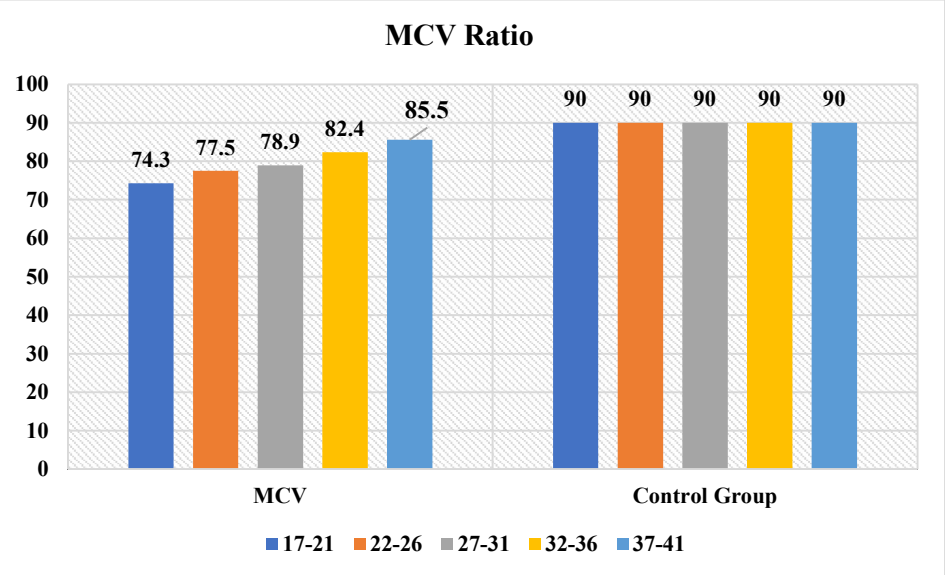

Figure.3 Showing graphical analysis of MCV in Pregnant women according to age wise distribution.

Figure showing the statistical and graphical analysis of Mean Cell Haemoglobin (MCH) in Pregnant women distributed by age (**Figure.4)**

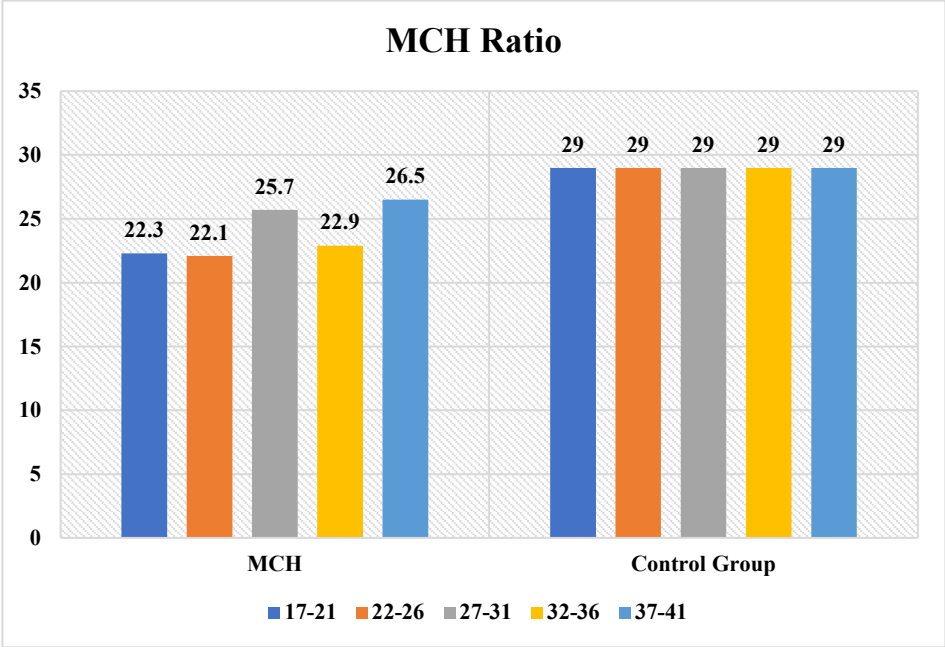

Figure.4 :Shows graphical analysis of MCH in Pregnant women according to age wise distribution.

The figure shows the statistical and graphical analysis of Mean Cell Hemoglobin Concentration (MCHC) in Pregnant women according to age distribution (Figure 5).

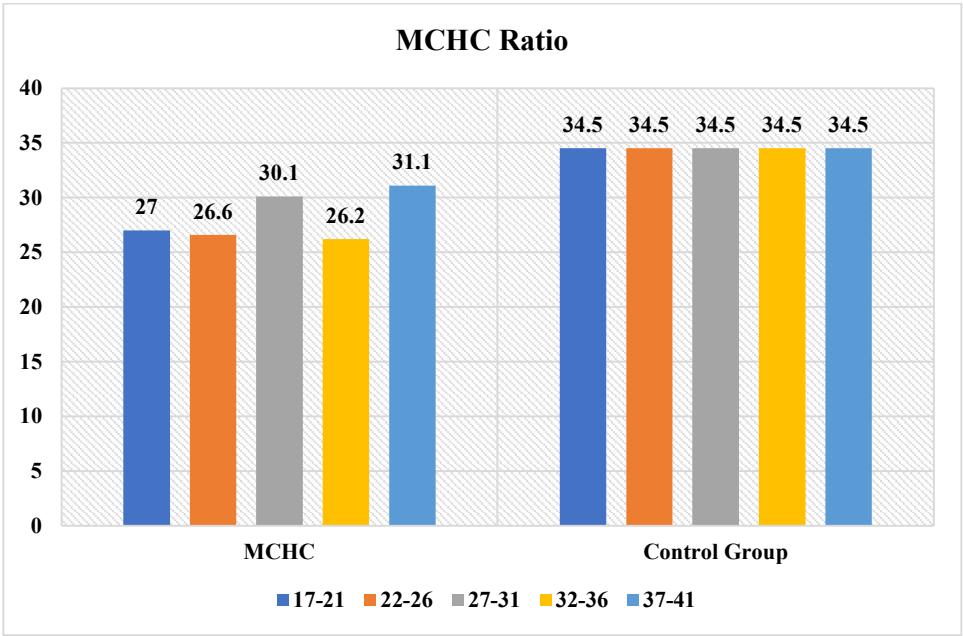

Figure.5: Showing graphical analysis of MCHC in pregnant women according to age-wise distributions

Figure 6 displays the statistical and graphical analysis of peripheral blood smears in pregnant women based on age distribution.

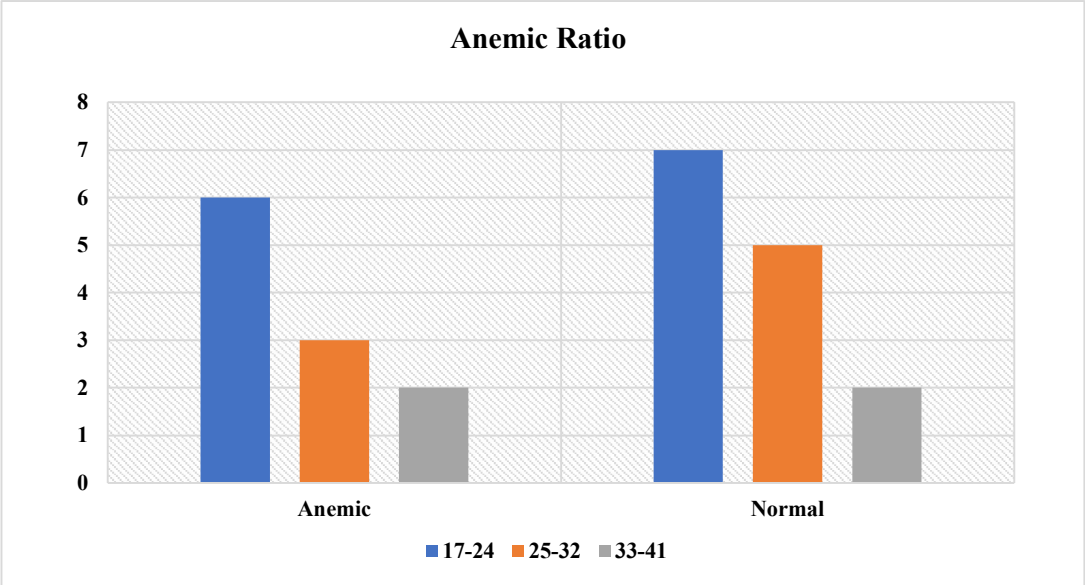

Figure.6. Shows a graphical analysis of anaemia in pregnant women according to age-wise distribution.

Figure.7 shows the statistical analysis of Ferritin in pregnant women according to age-wise distribution.

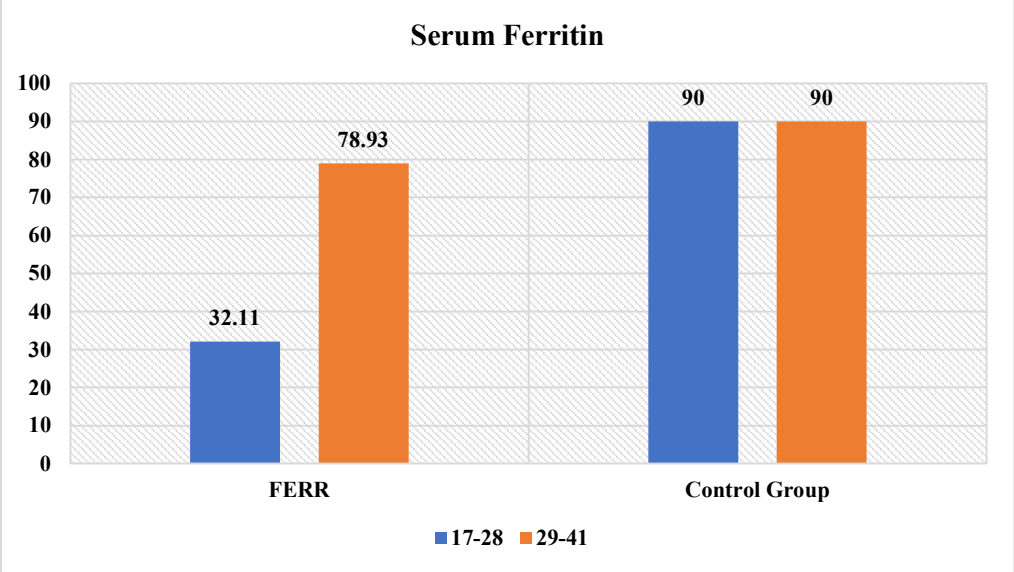

Figure.7 Shows a graphical analysis of FERR in pregnant women according to age-wise distribution.

Discussion

The study was also carried out in that non pregnant women were also checked for anaemia though their number compared to the rest of the categories was relatively low. The overall cross sectional prevalence percentage of iron deficiency anaemia among pregnant women was (76.7%). Fifty nine percent of the respondents had iron deficiency anaemia during pregnancy, with the second trimester having the highest prevalence 45.7% compared with first trimester 16.1% and third trimester 38.2 % pregnancy estimated (12). The risk is highest in women of childbearing age; 42% of pregnant women 15-49 years have anaemia, and 30% of non-pregnant women; greater than 85% in high-risk

region of Africa and Asia anaemia's causes which are multiple. By WHO, Iron deficiency is the most common nutritional disorder making it a global problem with approximately one-in-four people being affected mostly women of childbearing age (13). Worldwide, the approximate incidence of anaemia in women is of 36%. Also, 41.8 % of pregnant and 30.2% of non- pregnant women were determined to be anaemic. Anaemia in Pakistani women of the reproductive age group, and the rural area has a higher prevalence rate of 47%, as compared to 26% in urban areas. However, anaemia is even more common among pregnant women in urban areas, varying from 29% 6 to 50% among pregnant woman attending antenatal clinic in Karachi (14). The global estimate of iron deficiency anaemia is 2 percent for adult men, 9- 12 percent for non-Hispanic white women and over 18-19 percent for black and Mexican American women. Nine percent of patients older than 65 years with IDA have GIC when evaluated and studied (15). The range of prevalence of IDA in pregnant women reported from developing countries is between 35-75% of pregnant women on average, 56%; that from developed countries is 18% on average The effects of anaemia towards the health of both mothers and fetuses such as that severe anaemia increases maternal and infant mortality conducted, preterm labor and Small for Gestational Age (SGA) have been documented extensively (16). A similar study found out a prevalence rate to be as high as 96% in Multan city and 49% in Bangladesh. In Nepal, 58.9% of pregnant women had anaemia and 48.5% of them had helminth infestation (17). As for the types of diet, the regularity of consumption of the specific types of foods influenced the anaemia rates in a different way: the participants, the frequency of the consumption of red meat at least two time a week helped to reduce the anaemia rates, but the regular tea consumption negatively affected it. It is advised that women be informed on matters to do with iron, foods rich in iron, impact of taking tea on the amount of iron taken etc. Pregnant women should also be advised on the impact of pica or the taking of clay and dirt on iron absorption.

Conclusion

The present findings in conclusion revealed that pregnant women reported in the 100 samples at 22% while a lesser number among non-pregnant women entire all of whom are at high-risk including Iron deficiency anaemia in Peshawar. It has been found that they require a fresh health and balanced diet in large proportion A few examples are - iron containing food items and supplemental food items including Nutritional items for a caring mother and her growing child. They are advised to take foods with nutrients that contain iron and supplements for cases of anaemia in pregnant women.

Author Contributions

The Original draft was made by Saba Mazhar Shah, Hina Shaheen contributed to methodology, data collection, and experimentation. Faiza Mazhar conducted experiments and contributed to data analysis and manuscript drafting. Sajeela Akbar supervised the study and finalized the manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

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