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ORIGINAL ARTICLE

Prevalence of Iron Deficiency Anemia and its causes in pregnant women visiting OPD of CHK.

Dur-e-shahwar[1], Falak Baloch[2], Maryam Ishaque[3], Zareen Kamal[4], Zakir Ali Punar[5], Abdul Wasio[6]

ABSTRACT… Objective: To determine the frequency and causes of iron deficiency anemia in pregnant women, visiting OPD of CHK. **Study Design:** Descriptive, Cross-sectional study. **Setting:** OPD, Department of Obstetrics & Gynecology, Civil Hospital, Karachi. **Period:** 6 months from October 2020 to April 2021. **Methods:** A total of 169 women who visited antenatal clinic in 1st, 2nd and 3rd trimesters were included in this study. Then 5ml blood sample was taken by the researcher herself and sent to pathology laboratory for presence or absence of iron deficiency anemia. All the data was recorded on the pre-designed proforma. **Results:** The average age of the women was 30.01±4.62 years. The frequency of iron deficiency anemia in women was 65.09%. Rate of IDA was significantly high in pregnant women who had age >30 years (78.8%; p=0.0005), uneducated (84.6%; p=0.0005), lower socio-economic class (78.9%; p=0.0005), rural area (73.1%; p=0.006) and multigravida (82.7%; p=0.0005) and tea/coffee consumption (75.9%; p=0.0034) while red meat consumption was not statistically significant. **Conclusion:** It can be concluded from this study that anemia due to iron deficiency is highly prevalent in our study population. It was observed that the etiology of iron deficiency remains the same over the decades. Multiparty, poor socio-economic status, lack of education and poor dietary habits were responsible for high prevalence of IDA. Providing long term iron supplementation and dietary modification starting from adolescence may improve the hemoglobin levels and later on prevent anemia in pregnancy.

Key words: Anemia, Iron Deficiency Anemia, Morbidity and Mortality.

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INTRODUCTION

The World Health Organization (WHO) characterizes anemia during pregnancy as a condition where the hemoglobin level falls below 11 g/dl or hematocrit level less than 33%, at any point during pregnancy. Anemia during pregnancy is a major issue in many developing and industrialized countries.[1] Anemia during pregnancy is most commonly caused by iron deficiency.[1] Anemia usually affects all age groups but it is commonly prevalent among pregnant female.[1] Prevalence and the intensity of anemia among pregnant women visiting a tertiary care hospital in Pakistan is significantly high.[2] A cross sectional multicenter study from Pakistan showed the frequency of anemia in pregnancy to be 91%.[2]

Anjum A et al has shown the overall prevalence rate of anemia in pregnancy as 75% in Faisalabad, Pakistan.[3] Manzoor M et al has shown the occurrence of iron deficiency anemia during pregnancy as 78%.[4] Shams S et al has shown factors for iron deficiency anemia in expectant women as follows; age >30 years (60.0%), uneducated (65.0%), lower class (40.0%), rural area (70.0%) and multigravida (72.2%).[5] Shridevi has shown these factors as follows; age >30 years (12.5%), uneducated (41.6%) and multigravida (87.4%).[6]

The results of the WHO Multi country Survey on Maternal and Infant Health have highlighted anemia as the leading indirect cause of negative maternal outcomes including maternal mortality.[7] Iron deficiency (ID), even without the presence of iron deficiency anemia (IDA), adversely affects women of reproductive age, leading to reduced cognitive function and diminished physical performance.[8] We also belong to a country which is included in low- and middle-income countries of South East Asia. Burden of preventable diseases is much high in our country despite implementation of National awareness programs.

1. MBBS, FCPS, MRCPI (Obstetrics and Gynecology), Consultant Obstetrician and Gynecologist, Patel Hospital, Karachi.
2. MBBS, FCPS (Obstetrics and Gynecology), MRCOG, Diploma Project Management, Senior Clinical Fellow Obstetrics and Gynecology, Bedfordshire Hospitals, NHS Foundation Trust.
3. MBBS, FCPS (Obstetrics and Gynecology), Consultant Obstetrician and Gynecologist, Kohigoth Hospital, Karachi.
4. MBBS, FCPS (Obstetrics and Gynecology), Kohigoth Hospital, Karachi.
5. MBBS, MSPH, Diploma in Project Management, FETP Director Health Services, PPHI, Sindh.
6. MBBS, MD (Steward Carney Hospital Boston, MA), Consultant Physician, St Mary's hospital Waterbury Connecticut, USA.
Correspondence Address:
Dr. Falak Baloch
Department of Obstetrics and Gynecology, Bedfordshire Hospitals, NHS Foundation Trust.
drfalakn1@gmail.com

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Previous studies have shown significant variation in the prevalence of iron deficiency anemia among pregnant women, and its impact on both maternal and neonatal outcomes. Therefore, this study aims to determine the frequency and causes of iron deficiency anemia in antenatal women presenting at a tertiary care hospital. My study will reassess the stats in local population and then on the basis of the results, some public awareness programs can be arranged for early diagnosis and management of this condition during antenatal period in order to reduce the morbidity and mortality of both mother and fetus.

OBJECTIVES

The aim of this study is to determine the frequency and causes of iron deficiency anemia in pregnant women visiting the OPD of CHK.

OPERATIONAL DEFINITIONS

1. All women with singleton pregnancy of cephalic presentation (assessed through ultrasonography) of ≥12 weeks gestation (as determined by the LMP).
2. Iron deficiency anemia: The Hb <10 g/dl and serum ferritin level <15 ng/ml was taken as positive.
3. Causes of iron deficiency anemia:
    a. Age >30 years.
    b. Socioeconomic status: Kuppuswamy's socioeconomic status scale was used to assess the socioeconomic status which was divided into high (>40000), upper middle (30- 40K), lower middle (21-30K) and lower socioeconomic groups (<20k).
    i. Lower socioeconomic status was labelled as a factor
    a. Education status: It was defined as level of literacy.
    i. Illiterate
    ii. Primary school (1-5)
    iii. . Middle school (6-8)
    iv. High school (9-10)
    v. Intermediate (11-12)
    vi. Graduation/Post graduation

1. Illiterate was labelled as a factor
    a. Place of living: residential of city was taken as urban area and distance of 15 km from city was taken as rural area.
    i. Rural area was taken as a factor
    b. Multigravida: gravida >1 was taken as multigravida.

METHODS

This was an observational, cross-sectional study conducted at the OPD, Department of Obstetrics & Gynecology, Civil Hospital, Karachi, over a duration of six months, from October 2020 to April 2021. The sample size was calculated to be 169, based on a 95% confidence level, a 5% margin of error, and an assumed prevalence rate of iron deficiency anemia in pregnant women of 12.5%.[6] Non-probability, consecutive sampling was used for participant selection. Antenatal patients aged 18-40 years visiting the outpatient clinic, irrespective of their gestational age, were included in the study. Women with chronic illnesses leading to anemia, such as hemolytic anemia, TB, malaria, recent blood transfusions, bleeding diathesis, antepartum bleeding, chronic renal failure (serum creatinine >1.5 mg/dl), or chronic liver disease (serum bilirubin >2.0 mg/dl), were excluded. The study was conducted following formal approval from the College of Physicians and Surgeons of Pakistan (Letter reference number: CPSP/REU/OBG-2018-183-8542). 169 women meeting the inclusion criteria were selected. Informed consent was obtained from all participants, and a 5ml blood sample was drawn by the researcher and sent to the institutional pathology lab to test for iron deficiency anemia. The study also assessed factors such as age (>30 years), low socioeconomic status, illiteracy, multigravida status, and rural residence. All data, including age, gestational age, socioeconomic status, education, gravida, place of living, and iron deficiency anemia status, were recorded on a pre-designed proforma. Statistical analysis was carried out using SPSS version 25.0, with age, gestational age, and gravidity presented as mean and standard deviation. Socioeconomic status, education, place of living, occupation, and other factors were expressed in terms of frequency and percentage. The study employed stratification to control for variables such as age, education, socioeconomic status, gravida, consumption habits, and residence type. Post-stratification chi-square tests were used to assess their impact on the frequency and causes of iron deficiency anemia, with a p-value of 0.05 or

less considered statistically significant.

RESULTS

A sum of 169 pregnant individuals who visited antenatal clinic in 1st, 2nd and 3rd trimesters were part of this study. The majority of the patients were 26 to 35 years old as illustrated in Figure-1. The mean age of the women was 30.01±4.62 years, mean gestational age and gravida was also reported in Table-I. There were 101(59.76%) women who had primigravida while 68(40.24%) had multigravida (Figure-2). Most of the women were belonged to rural area as shown in Figure-3. Education and socio-economic status of the women are also reported in Figure-4 and 5 respectively. Regarding working status most of women were house wise (Figure-6). More than half women were reported working sickness (figure-7).

FIGURE-1

Age distribution of the patients (n=169)

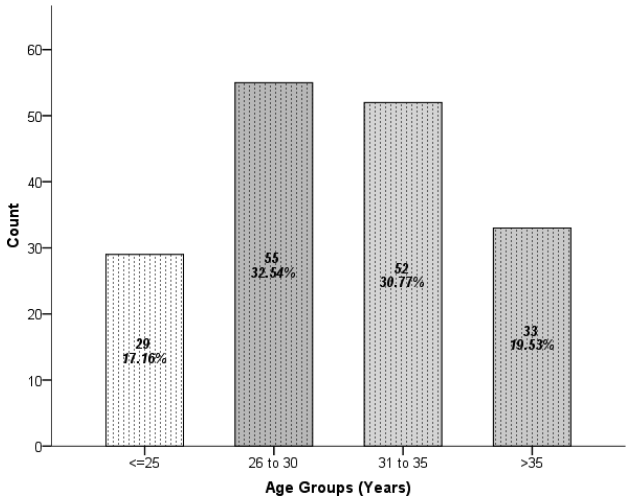


TABLE- I

Descriptive statistics of women

Variables	Mean (SD)	95% Confidence Interval for Mean	
		Lower Bound	Upper Bound
Age (Years)	30.01±4.62	29.31	30.71
Gestational Age (Weeks)	35.25±3.29	34.75	35.75
Gravida	2.02±1.39	1.81	2.23

FIGURE-2

Gravida status of the patients (n=169)

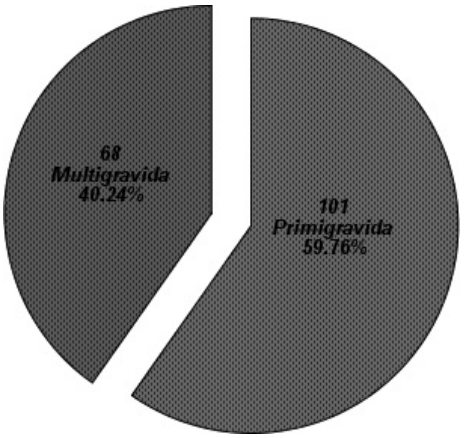


FIGURE-3

Residential Status of the patients (n=169)

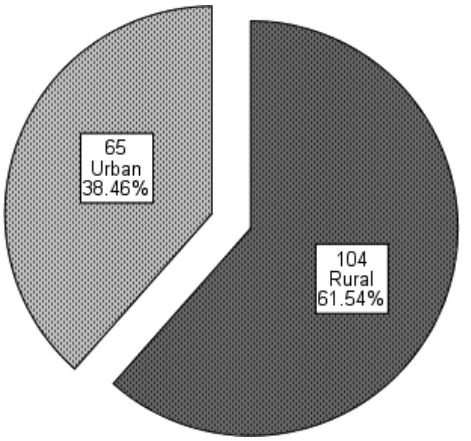


FIGURE-4

Educational Status of the patients (n=169)

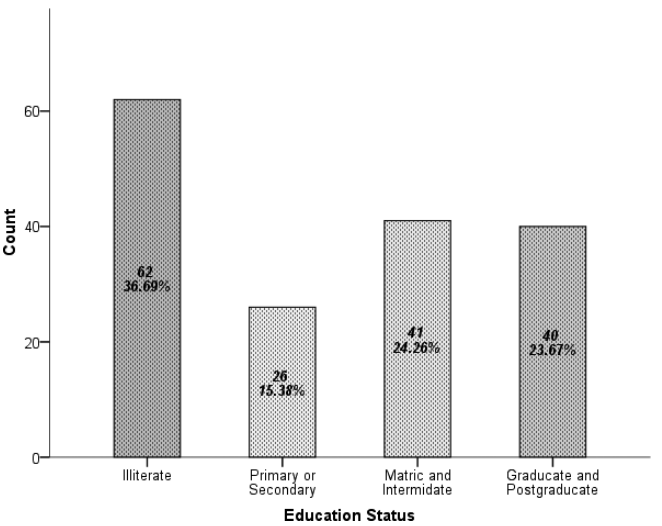


FIGURE-5

Socioeconomic status of the patients (n=169)

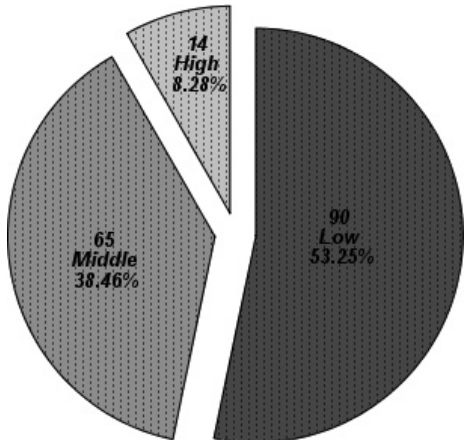


FIGURE-6

Occupational Status of the patients (n=169)

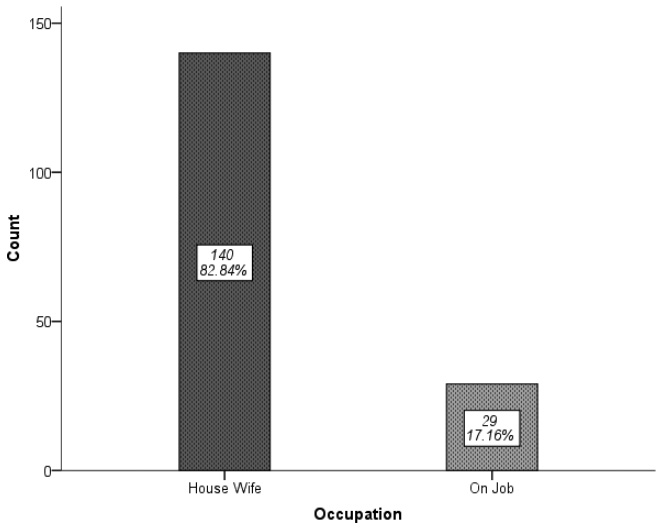


FIGURE-7

Working Sickness reported by patients (n=169)

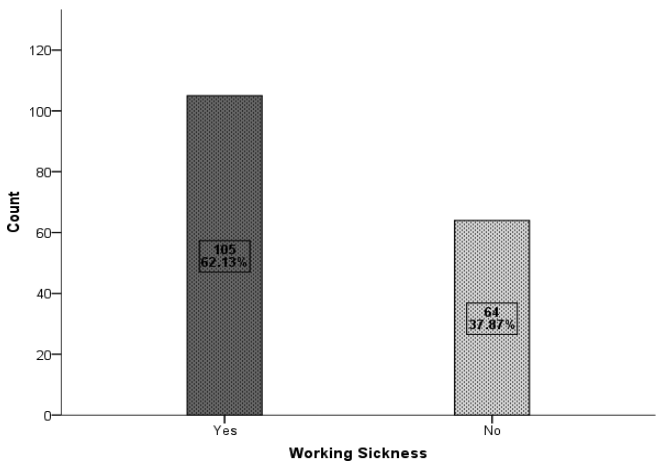
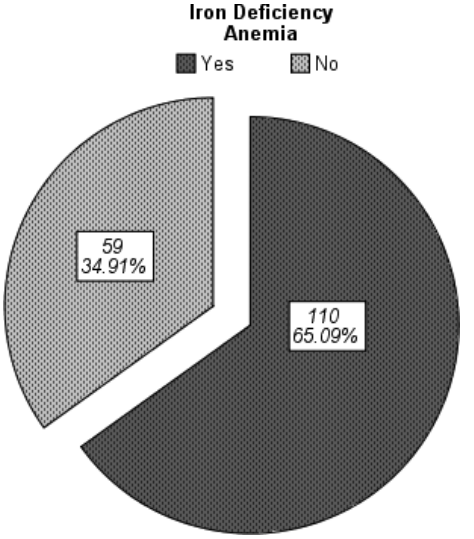


FIGURE-8

Frequency of Iron Deficiency Anemia in pregnant women (n=169)



The occurrence of iron deficiency anemia in women was 65.09%. Rate of IDF was significantly high in pregnant women who had age >30 years (78.8%; p=0.0005), uneducated (84.6%; p=0.0005), lower socio-economic class (78.9%; p=0.0005), rural area (73.1%; p=0.006) and multigravida (82.7%; p=0.0005) and tea/coffee consumption (75.9%; p=0.0034) while red meat consumption was not statistically significant as reported in Table-II.

DISCUSSION

Iron deficiency is the leading nutritional deficiency globally and the primary cause of anemia in pregnancy. The WHO's World Health Report 2002 states that up to 4–5 billion individuals, or 66– 80% of the global population, could be iron deficient, while 2 billion– over 30% of the world's population – are affected by anemia, mostly as a result of iron deficiency[9] Anemia during pregnancy and post-partum is a widespread issue globally, and for many women, it is self-limiting, typically resolving within a few weeks.[10] For some women, especially in resource-limited countries, iron deficiency is a significant cause of maternal morbidity (poor health) and mortality.[11,12]

Iron deficiency anemia (IDA) continues to be prevalent in developing nations, including Pakistan. Despite, its significant geographical role, Pakistan is still far from achieving its goal of addressing

TABLE- I I

Frequency of iron deficiency anemia in pregnant women [n=169]

Factors	Iron Deficiency Anemia		Total	P-Value
	Yes	No		
Age >30 Years				
Yes	69(78.8%)	18(21.2%)	85	0.0005
No	43(51.2%)	41(48.8%)	84	
Low socio-economic status				
Yes	71(78.9%)	19(21.1%)	90	0.0005
No	39(49.4%)	40(50.6%)	79	
Uneducated				
Yes	55(84.6%)	10(15.4%)	65	0.0005
No	55(52.9%)	19(47.1%)	104	
Multigravida				
Yes	62(82.7%)	13(17.3%)	75	0.0005
No	48(51.1%)	46(48.9%)	94	
Rural Resident				
Yes	76(73.1%)	28(26.9%)	104	0.006
No	34(52.3%)	31(47.7%)	65	
Tea/Coffee Consumption				
Yes	44(75.9%)	14(24.1%)	58	0.034
No	66(59.5%)	45(40.5%)	111	
Red meat consumption				
Yes	31(68.9%)	14(31.1%)	45	0.532
No	79(63.7%)	45(36.3%)	124	

IDA among vulnerable populations. A report from National Health Survey of Pakistan indicates that 50-60% of expectant mothers are affected by iron deficiency anemia (IDA).[13] The study aims to assess the prevalence and causes of iron deficiency anemia in pregnant women. A total of 169 women, 18-40 years of age, who visited antenatal clinic in 1st, 2nd and 3rd trimesters were part of this study. A total of 193 antenatal anemic women were included in this study. The majority of the patients were under 35 years of age, with an average age of 30.01±4.62 years. Studies, primarily from Bangladesh, identified older age as an important and significant factor contributing to anemia.[8,14] Out of 169 pregnant females, 59.76% were primigravida and 40.24% were multigravida. Pregnant women with 3 to 5 previous pregnancies have a increased risk of developing anemia in comparison to those with fewer than 3 pregnancies. 82.7%of multigravida in our study had Iron deficiency Anemia. This observation aligns with research from Saudi Arabia and India, which showed a higher number of pregnancies and deliveries is linked to an increased risk of anemia.[15,16] This may be attributed to the depletion of iron and other nutrients during frequent pregnancies, as well as the potential sharing of resources with the fetus. However, studies in Ethiopia and Nepal did not establish a link between gravidity and anemia.[17,18]

In this study, we found that the high prevalence of anemia is linked to the socioeconomic status of the families and their dietary patterns. The anemic condition of pregnant women is directly influenced by the socioeconomic status of the family or household. Anemia was more prevalent in families with lower socioeconomic status compared to those with moderate or higher socioeconomic status. The current results align with findings from studies conducted in India, Nigeria and Ethiopia.[19,20] This could be due to the financial constraints of pregnant women, limiting their ability to purchase nutritious food and maintain healthy eating habits. The prevalence of anemia in pregnant women is linked to sociodemographic factors such as social class, occupational status and educational background.[21] The association between anemia and education in the present study revealed that 84.6% of uneducated women were affected by anemia.

The study showed that lower levels of education were linked to a higher prevalence of anemia. This finding is consistent with studies conducted in Korangi, Karachi, and district Karak which reported a high incidence of anemia in illiterate pregnant women (55.6% and 88.0%, respectively).[22,23] The information above suggests that women with lower education levels have a higher likelihood of developing anemia during pregnancy. In the current study, the majority of the pregnant women were from the lower middle class, making up 53.2% of the total group, followed by 38.4% from the middle class and 8.2% from the upper class. Out of these 78.9% of lower socioeconomic group women had Iron deficiency Anemia.

This is similar to a study conducted in District Karak, where 80% of anemic pregnant women were from lower socioeconomic background.[23] In the present study, 61.54% of the women were from rural areas, while 38.4% resided in urban areas. 73.1% among the rural residents had Iron deficiency anemia. This could be because rural women from lower-income backgrounds often have limited access to resources due to reduced rates of external employment and reduced economic influence within the families, as highlighted in a study conducted in India.[24] The study found a negative association between tea and coffee consumption and maternal anemia. This finding is also supported by a previous study conducted in Costa Rica.[25] Tea/ Coffee consumption impact iron bioavailability, and due to their strong inhibitory effect on absorption, they are likely to worsen anemia during periods of increased physiological need or when dietary intake is insufficient.[26]

CONCLUSION

This study concludes that iron deficiency anemia (IDA) is prevalent in the study population, consistent with findings from other local studies. Key contributing factors include multiparity, low socioeconomic status, lack of education, and poor dietary habits. Despite national anemia control programs, IDA remains a persistent challenge in South Asia, including Pakistan. This study highlights the need for a holistic approach to address IDA, beyond iron and folic acid supplementation, including regular screening, nutritional education, and counseling. A focus on preventive supplementation, food fortification, and improved healthcare access, along with long-term iron supplementation starting in adolescence, could help prevent anemia in pregnancy.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHORSHIP AND CONTRIBUTION DECLARATION	
1	**Dur-e-shahwar:** Data collection.
2	**Falak Baloch:** Data analysis.
3	**Maryam Ishaque:** Data entry.
4	**Zareen Kamal:** Data interpretation.
5	**Zakir Ali Punar:** Writing.
6	**Abdul Wasio:** Revision.