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Research Article

Factors Associated with Iron Deficiency Anemia among Pregnant Women Visiting Outpatient Department of Jinnah Hospital Lahore, Pakistan

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- Consumption
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- Iron deficiency

Abstract

Background: Maternal anemia is a common problem in pregnancy, particularly in developing countries. The study was aimed at determining the factors associated with anemia among pregnant mothers who attended Jinnah hospital Out Patient Department (OPD) Lahore, Pakistan.

Objective: The objective of this study is to find the factors associated with iron deficiency anemia among pregnant women visiting Jinnah hospital Lahore.

Methods: A cross sectional study was conducted in Gynecology OPD, Jinnah hospital Lahore for one month by non-probability purposive sampling technique. Jinnah hospital is a tertiary care hospital with three units of Gynecology Department. The data was entered and analyzed by using the SPSS version 17.0 statistical software. p value ≤ 0.05 was considered as statistically significant.

Results: Out of 150 sampled women, 128 (85.3%) were anemic (Hgb<11g/dl). Out of 128, women 42 (32.8%) had mild anemia (10.0-10.9g/dl), 82 (64.1%) had moderate anemia (7.0-9.9g/dl) and 4 (3.1%) had severe anemia (<7g/dl). There was significant association (p ≤ 0.05) of iron deficiency anemia in pregnant women with monthly income and meat consumption.

Conclusion: In the present study, iron deficiency anemia is significantly associated with consumption of meat and monthly income.

ABBREVIATIONS

OPD: Outpatient Department; JHL: Jinnah Hospital Lahore; CBC: Complete Blood Count; Hb: Hemoglobin

INTRODUCTION

Safe delivery can be ensured by proper care during pregnancy [1].

Anemia is a medical condition in which red blood cell count or hemoglobin is less than normal (<11g/dl). In developing countries, maternal anemia is a common problem in pregnancy [2]. A research in India showed that pregnant women are aware that anemia is due to iron deficiency in blood (77.3%) [3]. Poor diet is the main cause of iron deficiency anemia and there is little awareness in pregnant women about the appropriate diet [4]. A study in a tertiary care hospital in Puducherry, India shows that 32.6% of women acknowledged that iron supplements should be taken with proper diet to reduce anemia [5]. Majority of the women (more than 80%) in Sierra Leone knew that malaria, poor diet and vaginal bleeding during pregnancy can result in iron deficiency anemia [6]. Statistical analysis shows that education, socioeconomic status and iron consumption are important

factors affecting severity of iron deficiency anemia [7]. Anemia, most common during pregnancy, is not only due to iron deficiency but also can also be caused by parasitic infections, vitamin A deficiency and increased metabolic demand during pregnancy [8]. C-reactive proteins and erythrocyte sedimentation rate are the markers of chronic inflammation, which also contribute to anemia in pregnancy [9].

A study in Ethiopia indicates that, age, family size, parity and economical status were found to be associated strongly with anemia during pregnancy [10]. In Morocco a study showed that the most affected age group by anemia during pregnancy was women aged over 35 years [11]. Gravidity and age of current pregnancy (trimester) were important variables, which show strong association with anemia [12]. Study in Tanzania reports that HIV may also cause anemia during pregnancy due to reactions by drugs, immune defects and improper erythropoiesis [13]. A significant relation has been found between anemia and non-consumption of fruits and vegetables [14]. The major clinical conditions related to the anemia in pregnant women are malarial attack and infection with hookworms, ascaris , S. mansoni , Giardia , and Entameba [15].

Anemia is a global public health problem affecting both developing and developed countries; approximately 1.3 billion individuals suffer from it. Pregnant women are the most vulnerable groups to iron deficiency anemia.

Pakistan is a low income country, with anemia as one of the significant public health issues. Our study aims to explain some of the modifiable risk factors that lead to iron deficiency anemia in pregnant women.

MATERIALS AND METHODS

Study design

Cross sectional study

Study setting

Study was conducted in Gynecology OPD, Jinnah Hospital Lahore. Jinnah Hospital is a tertiary hospital having three units of Gynecology department.

Duration of study

One month, 1-31 May 2017.

Sample size

150 pregnant women; Sample size was calculated using the *Cochran Formula* i.e.

$N = Z^2pq/d^2$

Where,

N is the sample size

Z has a value of 1.96 for 95% level of confidence,

p is estimated iron deficiency anemia prevalence taken to be 0.5,

q is1-p that is 0.5,

d is the margin of error with a value of 0.08.

Substituting for the variables:

$N = (1.96)^2 \times 0.5\ (1-0.5)/0.09^2$

N =150

So,

Sample Size = 150

Sampling technique

Non probability/ Purposive Sampling Technique

Sample selection

Inclusion criteria: Pregnant women in 1st, 2nd and 3rd trimester of gestation visiting Jinnah Hospital OPD, and who gave oral consent and had their CBC (Complete Blood Count) reports

Exclusion criteria: Women who were under inclusion criteria but did not give consent were not included. Similarly women in emergency condition, and those who were seriously sick were also excluded (unable to give sociodemographic data) from the study. We also excluded those with thalassemias, chronic disease, chronic bleeding, parasitic infestation etc (known cause of anaemia).

Data collection procedure

Individual consent was obtained orally before the questionnaires were given, ensuring confidentiality. Socio-demographic information which includes age, educational status, residence and occupation and other relevant possible risk factors including number of children, parasitic infections, gestational period, history of malaria attack, pregnancy gap and iron supplement of the study participants were collected by using a structured questionnaire. The Ethics Committee of Allama Iqbal Medical College gave the ethical clearance.

Data analysis procedure

The data was entered and analyzed by using SPSS version 17.0 statistical software. Descriptive statistics (frequency, percentages) were used for variables including age, educational status, residence, number of children, gestational period, parasitic infections, history of malaria, pregnancy gap and iron supplementation. Frequency tables and charts were used to present the summarized data.

Chi square statistical test (X^2) was used to compare anemia with related factors including age, educational status, residence, number of children, gestational period, pregnancy interval, parasitic infections, history of malarial attacks and iron supplementation, with statistical significance threshold of $p \leq 0.05$.

RESULTS AND DISCUSSION

A total of 150 pregnant women were included in the study. The ages of participants ranged from 18 to 42 years. 128 (85.3%) women were found anemic (Hgb<11g/dl). Out of 150 participants, 49 (32.67%) lived in rural areas and the rest 101 (67.33%) were urban dwellers.

Monthly income and anemia was also significantly associated ($p \leq 0.05$) with $x^2=25.952$ and degree of freedom = 12 (Table 1).

Table 1: Socio-demographic characteristics of pregnant women visiting Jinnah Hospital OPD.

Variables	Frequency	Percent	Chi square value	P value
Monthly income of family				
1-10,000	43	28.7		
11,000-20,000	55	36.7		
21,000-30,000	35	23.3		
31,000-40,000	5	3.3	25.952	0.011
41,000 and onward	12	8.0		
Number of family members				
1-3	20	13.3		
4-7	74	49.3		
8 or more	56	37.3	3.240	0.778

Majority of the women, 108 (72.0%), were in the third trimester (gestational age greater than 28 weeks), while 32 (21.3%) of the pregnant women were in their second trimester (between 13 and 28 weeks of gestation); 10 (6.7%) of the participants were in the first trimester (gestational age less than 13 weeks). Primigravida were 40 (26.7%). 123 (82.0%) participants had 3 children or less, and 26 (17.3%) had 4-8 children, only 1 (0.7%) participant had more than 8 children (Table 2). More than half, 87(58%) of the pregnant women were on iron supplements at the time of the study.

There was a significant association ($p \leq 0.05$) seen between lack of meat consumption and iron deficiency anemia with x^2=21.13 and degree of freedom = 12 (Table 3).

Out of 150 sampled women 128 (85.3% +/-0.774) were anemic. Out of 128 women, 42 had mild anemia (32.8%), 82 had moderate anemia (64.1%) and 4 had severe anemia (3.1%).

The current study attempted to assess factors associated with iron deficiency anemia in pregnant women. The overall prevalence of anemia was 85.3%, which is very high compared to other similar studies [15]. It is also higher when compared with the prevalence of anemia in pregnant women in Dhaka (37.0%) [2], Ethiopia (56.8%) [12] and Parakou (40.30%) [14]. The higher prevalence of anemia might be due to differences in sample size.

In this study, majority of anemic cases (64.1%) were of moderate type, which is greater than the study conducted in north-west Ethiopia (46.0%) [15], Parakou (56.3%) [14] and Dhaka (11.0%) [2]. However, the study conducted in southern Ethiopia had similar results to our study (60.0%) [10]. In this study insignificant association between anemia and number of children/ multiparty was observed, this finding corroborate to reports in the health centre in north west Ethiopia [15], and in antenatal clinic in Dhaka [2], but this contradicts findings in Parakou [14] and eastern Ethiopia [12] because of the differences in the sample sizes.

Significant association between intake of meat and iron deficiency anemia was found in a study which is contrary to the findings in Morocco [11]. Presence of anemia was also found associated with socioeconomic status (monthly income) but no association could be seen in study conducted in India [5], but according to study in Nepal, low socioeconomic status is associated with anemia in pregnancy [16].

Iron supplements intake wasn't found to be a possible determinant of iron deficiency anemia which is opposite to study in India [5], eastern Ethiopia [12] and North West Ethiopia [15].

Significant association between parasitic infections and anemia was found in a study conducted in south eastern Ethiopia which showed 13 (13.58%) pregnant women out of 363 were found to be malaria positive (detected through thick and thin blood films and subsequent malarial parasite count) and 69 (19.01%) were found infected with intestinal parasites (helminth count detected via collection of stool samples and analysis). However this contradicts with our study where we found no association, this may be due to high prevalence of parasitic infections in that area as compared to ours.

In our study, there was no association between literacy levels and iron deficiency anemia. The same result was found in a study that was conducted in India [5].

Our study showed that there was a frequency (21.3%) of women who were anemic in the 2nd trimester. The highest frequency was in the 3rd trimester of 72.0%. While study carried out in Morocco showed that highest frequency of anemia was found in 2nd trimester (12.20%) [11].

This study doesn't assess the role of micronutrients (serum folate and serum B12 levels), which can be the cause of anemia in pregnant women.

Our study has certain limitations. First, a food diary (an ideal for assessing the dietary history) was not reported by the subjects, rather we relied solely on the dietary history. Similarly a temporal relation between clinical illness and iron deficiency anemia wasn't assessed.

CONCLUSION

The conclusion of my study is that there was significant association ($p \leq 0.05$) of anemia in pregnant women with monthly income and meat consumption.

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Table 2: Pregnancy associated factors, causing iron deficiency anemia, in pregnant women visiting Jinnah hospital OPD.

Variables	Frequency	Percent	Chi square value	P value
Gravidity of respondents				
Primigravida	40	26.7	5.373	0.146
Multigravida	110	73.3		
Trimester of current pregnancy				
1st	10	6.7	2.745	0.840
2nd	32	21.3		
3rd	108	72.0		
Interval between previous pregnancies				
Primi	40	26.7	8.056	0.529
Less than 1 year	4	2.7		
1-2 years	69	46.0		
3 years or more	37	24.7		
History of Cesarean section				
Primi	40	26.7	9.235	0.161
Yes	57	38.0		
No	53	35.3		
Children of respondent				
0 – 3	123	82.0	24.292	0.614
4 – 8	26	17.3		
9 and above	1	0.7		

Table 3: Food supplementation of pregnant women visiting Jinnah Hospital OPD.

Variable	Frequency	Percentage	Chi square value	P value
Consumption of meat				
More than once daily	2	1.3	21.123	0.048
2-7 times a week	29	19.3		
Once a week	46	30.7		
Rarely	47	31.3		
Never	26	17.3		
Consume any iron supplements during the course of your pregnancy				
Yes	87	58.0	7.372	0.061
No	63	42.0		

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