Low haemoglobin levels, its determinants and associated features among pregnant women in Islamabad and surrounding region

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Abstract

Objective: To estimate the haemoglobin levels in pregnant women and to determine the socio-demographic factors associated with anaemia in pregnancy.

Patients and Methods: In this cross-sectional survey, a total of 200 patients visiting prenatal clinic of Shifa International Hospital/Shifa Foundation Community Health Centres, Islamabad over the period of six months, both booked and non-booked were included. A detailed questionnaire was filled and complete blood count, peripheral smear and absolute values were performed in all cases. Haemoglobin levels (Hb) of women below 10.5g/dl were considered to be low (anaemia) and were further subjected to urine/stool routine examination. Cases of thalasaemia trait were excluded from the study. All the data was entered in SPSS v 10.0. Descriptive analysis was done obtaining frequencies for socio-demographic factors. Mean haemoglobin levels along with standard deviation and confidence interval were reported. Frequency of helminthic infestation of suspected cases was also reported. Analysis included any significant differences in mean haemoglobin levels of booked versus non-booked cases.

Results: Mean haemoglobin of our study population was 11.0±1.64 g/dl. Frequency of decreased haemoglobin was found to be in 42.5%. Mean haemoglobin of patients having income less than Rs5000 was 10.5±1.24 g/dl and those with income more than Rs5000/month had a mean Haemoglobin of 11.5±1.44g/dl. Mean haemoglobin of patients with history with or without pica eating was 10.1±1.31g/dl and 11.9±1.56g/dl respectively.

Conclusion: Low haemoglobin was commonly seen in our population among pregnant women irrespective of their socioeconomic status. The severity of anaemia was significantly associated with lower socioeconomic status and odd eating habits (JPMA 59:86; 2009).

Introduction

The importance of anaemia as a major public health problem throughout the world is widely recognized.[1] Anaemia in pregnancy is multi-factorial in aetiology and according to the 2005 WHO field report the prevalence of anaemia among pregnant women in Asia averages 41.6%.[2,3] However, most studies that have looked into these conditions confirm that more than 80% of cases of anaemia in women especially during pregnancy, are associated with or have an important iron deficiency component.[4] Various studies conducted in Pakistan documented prevalence of anaemia between 43 to 76%.[5-7] Factors leading to anaemia in obstetric cases are multiparity and blood loss in ante-partum, intra partum and postpartum period. Lactation, malnutrition and mal-absorption are the additional factors.[8]

Anaemia in pregnancy is a serious condition contributing to increased maternal and foetal morbidity and mortality.[9] Maternal consequences of anaemia include cardiovascular symptoms, reduced physical and mental performance, reduced immune function, and increased risk for blood transfusion in the post partum period.[10] A detailed compilation of prevalence of anaemia in women published by Brabin (2001), estimated that maternal mortality ranges from 27 per 100,000 live births in India to 194 per 100,000 live births in a hospital-based study in Pakistan to 42 of 44 maternal deaths in Somalian refugee camps.[3]

Foetal consequences of iron deficiency anaemia are an increased risk of growth retardation, pre-maturity, intrauterine death, amnion rupture and infection.[10] It also has an irreversible negative consequence on infant cognitive development. The salutary effect of iron supplementation on improvement of haemoglobin levels in pregnancy has been documented in various studies.[11]

The present study was conducted with the aim of determining the frequency of low haemoglobin amongst pregnant women in Islamabad and its surrounding regions along with its socio-demographic associates.

Patients and Methods

Two hundred patients from Islamabad and its surrounding areas, who visited prenatal clinics, over a period of 6 months, of Shifa International Hospital and Shifa College Community Health Centre Islamabad, were enrolled. A detailed questionnaire was filled during patient's history taking. Epidemiological information including age, parity, booking status and socioeconomic status were documented. Study participants were specifically asked about the type of diet and any peculiar eating habits like mud (pica), uncooked rice, peanut shells, and betel nut. Complete blood count, peripheral smear and absolute values were done for all women. Blood samples were collected in EDTA treated tubes and blood examination was carried out using SYSMEX- KX haematology analyzer. Commercial controls were tested before each batch.

Women with haemoglobin less than 10.5g/dl were labelled as anaemic and were further subjected to urine/stool routine examination. Patients with thalasaemia trait were excluded from the study. All the data were entered in SPSS v 10.0 and was analyzed. Descriptive analysis was done obtaining frequencies of socio-demographic factors. Mean haemoglobin levels along with standard deviation and confidence interval were calculated. Frequency of helminthic infestation in suspected cases was also reported.

Results

The demographic information of the study population is shown in Table 1.

Table 1: Demographic profile of pregnant women (n=200).

Variables	Mean±SD	Range
Age(years)	26 ± 4.6	20-38
Gestational Age (weeks)	22.4 ± 10.5	5-40
	Frequency	**Percentage**
Trimester		
First	40	20
Second	70	35
Third	90	45
Monthly income of spouse		
Less than Rs 5000	140	70
More than Rs 5000	60	30
History of pica eating		
Yes	65	32.5
No	135	67.5

Mean haemoglobin in the study population was 11.0±1.64 g/dl. Frequency of low haemoglobin was found to be 42.5%. The mean haemoglobin of patients having income less than Rs 5000 was 10.5±1.24 g/dl and for those with income more than Rs.5000/month it was 11.5±1.44g/dl. Patients with history of pica eating had a mean Hb of 10.1±1.31g/dl while for those with no history of pica eating it was 11.9±1.56g/dl (Table 2).

Table 2: Mean haemoglobin values among pregnant women.

Variables	Mean±SD	Range
Haemoglobin g/dl	11.0±1.64	5-14.1
	Frequency	Percentage
Haemoglobin <10.5 g/dl	85	42.5
Haemoglobin >10.5 g/dl	115	57.5
	Mean±SD	Range
Haemoglobin of patients having income <5000 Rupees	10.5±1.24	5-13.2
Haemoglobin of patients having income >5000 Rupees	11.5±1.44 (p<0.0001)	6.5-14.1
Haemoglobin of patients having history of Pica	10.1±1.31	5-12.8
Haemoglobin of patients having no history of Pica	11.9±1.56 (p<0.0001)	6.7-14.1

According to the WHO grading for anaemia, 29% had mild, 11.5% moderate and 2% had severe anaemia. (Table 3)

A downward trend in mean level of haemoglobin

Table 3: Categories of anaemia according to WHO grading.

Severity	Frequency	Percentage
Mild (9.5g/dl-10.9g/dl)	58	29
Moderate (8g/dl-9.4g/dl)	23	11.5
Severe (6.5g/dl-8g/dl)	4	2
Total	85	42.5

was found with the progression of pregnancy (Fig 1).

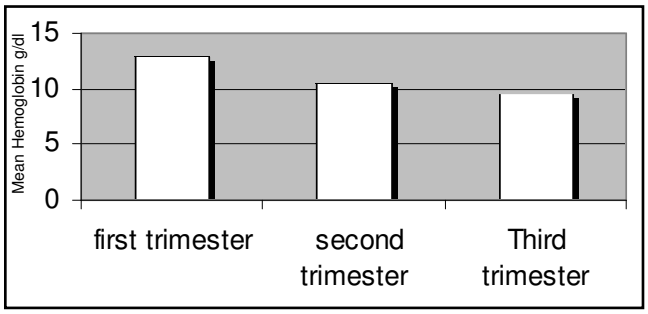

Figure 1: Mean haemoglobin level by trimester of pregnancy.

Discussion

The present study highlights the high frequency of low haemoglobin levels among pregnant women in the capital city of Pakistan and the nearby villages. The study included patients belonging to all socioeconomic strata. Such a high frequency of anaemia in all socioeconomic strata and in all trimesters points to serious lack of available resources especially iron supplementation.

Frequency of low haemoglobin levels (42.5%) was found amongst pregnant women in the study. It can vary considerably because of differences in socioeconomic conditions, lifestyles and health-seeking behaviours across different parts of the country. However, this high prevalence of anaemia in Pakistan and other Asian countries indicates that anaemia is a serious public health issue that needs attention. In a study from Ethiopia, the overall prevalence of anaemia was 41.9%, which is very similar to our results.[12]

It was noted in the present study that there was a progressive fall in the mean haemoglobin from first trimester through the third trimester which is also shown in other studies. Mean Haemoglobin in our study dropped from 12.8gm/dl (range 9-14.1gm/dl) in first trimester, to 9.6gm/dl (range 5-11.3gm/dl) in third trimester. This trend was also found by Morasso et.al (2002) in a study conducted in Chaco, Argentina, in which anaemia prevalence (Hb < 11.0 g/L) was found to be 17.4%, 26.5% and 35.8% in patients from 1st to 3rd trimesters respectively.[13] A Nepalese study also demonstrated a progressive iron depletion during pregnancy that became worse in the third trimester suggesting underlying iron deficiency as a cause for anaemia.[14]

Mean age in the present study was 26±4.6 years which shows that majority of women presenting to our institute begin their reproductive life with low haemoglobin if not fully developed anaemia and confirms the findings of other studies conducted in similar settings.[1] In another study mothers in the age groups 10 to 19 years and 30 to 39 years constituted higher percentages of anaemia compared to the other age groups.[15]

Odd eating habits that include pica eating was found in 32.5% of our patients, who had mean haemoglobin <10.5g/L as compared to mean haemoglobin value of 11.1g/L for those who had no history of pica eating. These women were eating uncooked rice, peanut shells and mud, all potential sources of worm infestation which in turn leads to iron deficiency anaemia.[16]

We tried to correlate frequency of low haemoglobin with socioeconomic class and found that patients with a monthly income of less than Rs. 5000 had Hb value which was 1 gm/dl lower than patients with monthly income greater than Rs.5000.

One of the limitations of the present study is that it was conducted in a tertiary care hospital located in capital city. As many of the Pakistani women in our country do not have access to antenatal facilities, the frequency of low haemoglobin levels would have been even more in the general population.

Conclusion

Anaemia is common in our population among pregnant women, irrespective of their socioeconomic status. The severity of anaemia was significantly associated with lower socioeconomic status and odd eating habits. The overall frequency of anaemia was found to be higher in the younger age group.

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