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Prevalence of Anemia in Pregnant Women Attending CCM Medical College and Hospital Chhattisgarh

Authors
Dr Baljeet Kaur Bhatia[1], Dr Rekha Ratnani[2]
[1]Senior Resident Dept. of OBGY Chandulal Chandrakar Memorial Medical College, Kachandur, Durg (Chhattisgarh) 490024
[2]Professor and HOD Dept. of OBGY Chandulal Chandrakar Memorial Medical College, Kachandur, Durg (Chhattisgarh) 490024
Corresponding Author
Dr Rekha Ratnani
Professor & HOD Dept. of OBGY, CCM Medical College Kachandur, Durg (CG)

Introduction

Decreased concentration of haemoglobin or decrease the concentration of circulating red blood cells and transport oxygen capacity impaired known as anemia. It has been seen that multiple factors that can precipitating in isolation. These factors are genetic, haemoglobinopathies, infectious diseases, malaria, intestinal helminthes, Chronic infection and due to nutritional deficiency, which includes deficiency of iron, vitamins (folate, B12, vitamins A) and copper. During Anemia pregnancy is considered when haemoglobin concentration is > 7.0 g/dl, moderate when haemoglobin falls between 7.0 - 9.9 g/dl.

Due to anemia in pregnancy is one of the most common causes of maternal morbidity and poor perinatal outcome. The main causes of anemia during pregnancy were nutritional deficiency, infectious disease and parasitic infected diseases[(1)]. Out of that, iron deficiency is major contributor to anemia in pregnancy. In developing countries its estimate that due to nutrition anemia affects almost two-thirds in pregnant women. However, many of these pregnant women were already anemic at the time of conception due to low socio economic status, it has been estimated that the prevalence of anemia 50% among non-pregnant women in developing countries[(2)]. Nutritional, genetic, and parasitic infectious diseases are major contributing factors in anemia.

It's estimated that the prevalence of anemia in developing countries were 9% and in low developing countries the prevalence is 43%. Globally, at reproductive age of younger children more than 5 years the estimated prevalence of anemia is 47%, it is found that in pregnant womens 42% and 30% in non-pregnant women between age 15–49 years. In Africa and Asia it is estimated that more than 85% of the absolute anemia burden in high risk groups[(3)]. According to WHO in India it is report the prevalence anemia in pregnant women in 1990 was 54 % and in 2016 it was 50%.In India, it's estimated that 50 % population of India suffers from anaemia.

Under Government of India, The ministry of Health has recommended daily 100mg iron tablets with 500 mcg folic acid tablets from second half of the pregnancy for a period of at least 100 days. According to World health organization IDA is the third leading cause of disability- adjusted life years lost for females aged 15–44years[4]. In 1993, the World Health Organization instituted its Safe Motherhood Initiative with a goal of reducing the number of maternal deaths by half before the year 2000. In India, anemia is the second most common cause and accounting for 20% of total maternal deaths[5-6].

The determination of these factors will help to provide valuable for the implementation of interventions to reduce anemia. There is a need for research exploring the prevalence of anemia and predisposing risk factors for anemia observing at the time of delivery. Pregnant women with anemia, those going into labor and delivery, have the highest potential to encounter complications related to anemia and transfusion. At the time of delivery loss of blood may not impair the hemodynamic response of women with normal hemoglobin levels but may be too hazardous for anemic women[8].

Therefore the present study planned to determine the prevalence of anemia and find out the factors contributing to anemia in pregnant women attending our hospital at Durg district Chhattisgarh.

Aims and objectives of study

1. Study the prevalence of anemia among pregnant women in CCMMC and Hospital Durg.
2. Study the various factors influencing anaemia.

Material and Methods

The study was conducted at Chandulal Chandrakar Memorial Medical College Durg from September 2015 to April 2017. This was a prospective, observational study of contains 1,142 pregnant women enrolled at 21 to 29 weeks of gestation and followed to 6 weeks postpartum. A blood sample was obtained at enrollment to determine hemoglobin levels. Information on nutritional knowledge, attitudes, and practice and dietary history regarding usual food intake before and during pregnancy were obtained by trained interviewers within 1 week of registration.

Study Participants

The study participants for this study were pregnant women who were attending antenatal care at CCMMC and Hospital during the study period.

Inclusion Criteria

Pregnant women who came for ANC during the study period were included in the study.

Exclusion Criteria

Pregnant women who were seriously ill during the survey were excluded.

Data Analysis

The data were collected and analyzed by using SPSS software package 21.0 version. The data were expressed in percentage. The chi Square test will be used for comparison of categorical variable I the $p<0.05$ was considered statically significant and the strength of association was estimated in odds ratio and its 95% confidence interval.

Nutrition knowledge, attitudes, and practices and dietary history

Information on knowledge, attitudes, and practices regarding food intake during pregnancy and dietary history of food intake before and during the current pregnancy was obtained with the use of a structured questionnaire by trained personnel. In addition, a 24-hour dietary recall was obtained[9].

Anemia assessment

At the time of enrollment, 3 ml of venous blood was collected by a trained technician using standard procedures. The hemoglobin concent-ration was determined by Sahli's method[10]. Anemia was classified according to the World Health Organization (WHO) classification for pregnant women[11]. Mild anemia was classified as hemoglobin concentrations of 9.0 to 10.9 g/dl,

moderate anemia as hemoglobin concentrations of 7.0 to 8.9 g/dl, and severe anemia as hemoglobin concentrations < 7.0 g/dl. A study participant was considered non-anemic if her hemoglobin concentration was ≥ 11 g/dl.

Observations and Discussion

Table 1 Prevalence of anemia in 1142 pregnant women in CCM Medical College and Hospital Durg

Group of Pregnant Women	No of Patients	Mean SD (Hb g/dl)
All Pregnant Women	1142	9.5 ±1.2
Non Anemic	489	12.3± 0.6
Total Mild Anemic pregnant women= 440 Avg Hb= 10.23 ±0.63		
10.0 to 11.0 g/dl Hb	254	
9.0 to 10.0 g/dl Hb	186	
Total Moderate Anemic pregnant women=140 Avg Hb= 7.95 ±1.05		
8.0 to 8.9 g/dl Hb	87	
7.0 to 7.9 g/dl Hb	53	
Total Sever Anemic pregnant womens=73 Avg Hb= 6.37±1.95		
Less than 7.0 g/dl Hb	73	

Nearly half of the women had borderline anemia, with hemoglobin concentrations more than 10 g/dL but less than 11 g/dL. These are encouraging findings for policy makers, because the effort required to reduce the prevalence of anemia in nearly half of pregnant urban women should not be as great as that needed to produce normal hemoglobin levels in women with more severe anemia. Pre-pregnancy screening with appropriate nutritional counseling or iron and vitamin supplementation may be the best intervention to reduce the high prevalence of pregnancy-related anemia. On the other hand, mild anemia may be due to other causes, such as thalassemia minor, which would have very different policy implications.

Table 2: Anthropometric and demographic characteristics of pregnant women according to anemia status

Characteristic	No anemia (*n* = 489)	Mild anemia (*n* = 440)	Moderate to severe anemia (*n* = 213)	*'P'* Value
Hemoglobin—g/dl	11.5 ± 0.4	10.23 ± 0.63	7.16 ± 1.5	
Age—yr	25.7 ± 4.2	25.3 ± 5.7	27.9 ± 6.0	0.04
Height—cm	151.9 ± 5.0	152.2 ± 6.7	149.2 ± 6.1	0.00
Weight—kg	64.0 ± 10.6	54.9 ± 10.9	48.9± 8.94	0.00
BMI	26.6 ± 4.7	24.0 ± 4.5	22.1 ± 3.7	0.00
Underweight (BMI < 18.50)	4 (3.3)	27 (74.2)	12 (22.5)	0.00
Formal education				0.00
No	264 (7.7)	284 (70.9)	116 (21.4)	
Yes	225 (10.4)	156 (77.0)	97 (12.6)	
Employed				.036
Yes	19	37	17	
No	470	403	196	

The mean hemoglobin concentration was significantly lower among women with no formal education than among women with some formal education, but there was no significant difference in hemoglobin levels between employed and unemployed women. In our study, anemic women

had a lower BMI than non-anemic women. However, the mean mid-pregnancy BMI of severely anemic women was 22.1 ± 3.7, suggesting that these women had adequate energy intake but that their diets may have been deficient in dietary iron or that they had poor iron absorption. The anemic women in our study were also significantly shorter than the non-anemic women, suggesting a sustained pattern of under-nutrition in their early childhood and implying not only inadequate caloric or nutrient intake but also an inadequate overall diet. We found the hemoglobin concentration of employed women to be lower that of unemployed women. This was not an unexpected finding in our study setting, where women often need to work outside the home because of low family income.

This study revealed that the prevalence of anemia in women within 24 h before delivery was 57.9% which is higher than the estimated average prevalence rate of 50.0% documented by World Health Organization (WHO) for our country[(2)]. This high prevalence of anemia among pregnant women in this study may be explained by the distribution of socioeconomic status of the population. However, the rate in our study was derived from the population, which was mainly composed of women with lower socioeconomic status. Another noteworthy point is the variation in the gestational age at the time of measurement. Contrary to previous studies, the hemoglobin values of the women in our study were evaluated in the third trimester of pregnancy, in which fetal growth and red blood cell expansion increases the prevalence of anemia[(7, 8)]. Additionally, in this study, it is demonstrated that pre-delivery anemia was related to parity, educational level, employment, BMI, duration of iron supplementation, and preeclampsia.

In a study of the Indian Council of Medical Research (ICMR) in 1989[(12)], prevalence of anaemia in 4181 pregnant rural women of 11 States was estimated and it was demonstrated that 87.6 percent women had haemoglobin (Hb) <10.9 g/dl. ICMR in 1992[(13)] reported that in 6 States supplementation of iron-folate tablets to control anaemia (women with haemoglobin < 7.0 g/dl were excluded) had 62 per cent women as responders (anaemic-those responding to haematinic therapy by showing rise in haemoglobin). Even after consuming 90 tablets, 37.8 per cent women had haemoglobin less than 10.0 g/dl and 19.4 per cent had less than 9.0 g/dl. During 1986-1991 haemoglobin estimations in rural pregnant women in Varanasi showed 94.5, 95.3 and 95.9 percent prevalence of anaemia in I, II and III trimesters (14). ICMR district nutrition survey 1999-2000 also reported prevalence of anaemia as 84.2 per cent with 13.1 per cent with severe anaemia in pregnancy[(15)]. Haemoglobin in all these studies was estimated by cyanmethaemoglobin method[(16)].

Another finding is that more than half the women with anemia (57.1%) had 10 or less antenatal care visits. In other words, the women who were admitted for antenatal care less than 10 times during the pregnancy had significantly higher prevalence of anemia than those that were admitted 10 times or more during the pregnancy. A multi-country randomized control trial conducted by WHO showed that essential interventions can be provided over four visits at specified intervals, at least for healthy women[(17)].

On the basis of our study we concluded that, prevalence of anaemia and severity in rural pregnant and lactating women was much higher. Screening for anaemia, treatment of anaemic women, and availability of food fortification (wheat flour with iron and folic acid), milk sugar and salt with iron to build long term iron stores remains the key to reduce anaemia. Even cooking in cast iron utensils improves iron content in diet. The anaemia control programme needs to be implemented more efficiently in these States. The interstate differences observed may guide the health planner to alter the strategies for control of anaemia in poor performing States.

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