



Prevalence of Anemia and Associated Risk Factors among Pregnant Women Attending Antenatal Care Clinic at Katihar Medical College & Hospital, Bihar

Seema Kumari¹, Dharmvir Ranjan Bharati², Anil Kumar Jayaswal³, Ranbir Pal⁴, Shivani Sinha¹, Anju Kumari⁵

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Author's Affiliation:

¹Senior Resident; ²Asso Prof. Dept of Community Medicine, IGIMS, Patna; ³Professor, Dept. of Community Medicine, KMCH, Katihar; ⁴Prof and Head, Dept. of Comm. Medicine, ESIC medical college, Faridabad; ⁵Senior Resident, Dept. of Physiology, IGIMS, Patna

Correspondence

Dr. Seema Kumari
dr.skmailbox@gmail.com

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ABSTRACT

Background: In India anaemia continue to be high (88.5%) and is the second most common cause of maternal deaths, accounting for almost one-fifths of total maternal deaths.

Objectives: The present study was undertaken to find the prevalence of undiagnosed anemia among pregnant women and its socio-demographic correlates.

Methods: It was a hospital based cross-sectional study, conducted among 400 pregnant women attending their first time antenatal visit at the outpatient department of Obstetrics and Gynecology of Katihar Medical College and Hospital.

Results: Out of 400 pregnant women 88.5 percent were found to be anaemic; maximum in the age group of less than 18 years. Anemia was significantly associated with age, parity, gestational age and inversely related to religion, birth interval, type of the family, socioeconomic and educational status, calories and protein intake.

Conclusions: The prevalence of undiagnosed anemia among pregnant women was quite high and were associated with age, parity, gestational age, birth interval, diet, socioeconomic and educational status.

Key words: anemia, pregnant women, nutritional status, literacy, utilization of health services

INTRODUCTION

Anaemia is defined as decreased haemoglobin level, or circulating red blood cells and it is the most common haematological disorder during pregnancy. Pregnant women with haemoglobin level less than 11g/dl should be considered as anaemic.¹ WHO has estimated the prevalence of anemia among pregnant women in developed countries is about 14%, developing countries 51% and 65 to 75% in India.² Various studies from different regions of the India have reported the prevalence of anaemia to be between 33-100%.³ According to Na-

tional Family Health Survey-3 (NFHS-3), prevalence of anaemia was 59% in pregnant women.⁴

A United Nations expert panel considered severe anaemia (< 7g/dl) as an associated cause in up to half of the maternal deaths worldwide. In India, anaemia is the second most common cause of maternal death, accounting for 20% of total maternal deaths.³ Anemic pregnant women will be at risk of low physical activity, increased maternal morbidity and mortality, especially those with severe anemia. In addition, both pregnant women and their neonates encounter negative consequence includ-

ing fetal anemia, low birth weight (LBW), preterm delivery, intrauterine growth restriction and perinatal mortality⁵, reduced work capacity, decreased mental performance, low tolerance to infections, death from anemic heart failure and maternal deaths due to uncontrolled bleeding.⁶

Many study were conducted in India and abroad identified, various socio-demographic factors such as age, religion, educational status, socio-economic status, type of work, type of family, dietary habit, gestational period, birth interval, parity were associated with the prevalence of anaemia during pregnancy. Anaemia is easily diagnosable, treatable and totally preventable disease. It needs no expert opinion, treatment is simple, inexpensive and cost effective. Thus to curtail the total prevalence and lessen the complications caused by anaemia, an awareness has to be generated amongst the common masses. It must become a "Mass Movement" and for this to happen. We have to the involvement of general public, social workers, NGOs, doctors and paramedical, politicians and above all the media people. FOGSI has declared year 2002 as the year of "War on anaemia" as according to it the eradication of anaemia is the Key to "Safe motherhood" and corner stone of "Reproductive and child health Programme".⁷

Hence, it would be important to study the prevalence of undiagnosed anaemia and its relationship with various socio-demographic variables among the pregnant women.

METHODS

This institution based cross-sectional study was conducted during January to June 2013 among the pregnant women attending antenatal clinic in the Obstetrics and Gynaecology department in the Katiyar Medical College & Hospital, first time during their gestational period, to find out the prevalence of undiagnosed anaemia and its relationship with various socio-demographic variables among the pregnant women.

Study population consisted of all pregnant women coming first time ANC clinic outpatient department of the hospital fulfilling inclusion and exclusion criteria as well as providing informed written consent to participate in the proposed study. Inclusion criteria for recruitment of participants were, pregnant women those who are attending the first time ANC clinic and given written informed consent, willing to participate and who has given written consent. We excluded patients who were severely ill, did not consent to the study and those who did not fulfill the inclusion criteria.

The sample size was determined by using single population proportion formula ($n = Z^2pq/d^2$) by

considering 95% CI, 87% proportion of anaemia during pregnancy from published literature.⁸ In order to determine the prevalence among the study population with a precision of 5 percent and a 95 percent confidence interval (CI), and 4% considered for absolute error, the required sample size was 290 subjects and additional 15 percent added to take care of non-response related issues who were unable to respond and another 30% to take care of design effect consequently 400 pregnant women were included in the study.

Ethical consideration: Ethical clearance was obtained from the Institutional Review Board. Written informed consent was obtained from each study participant after they were introduced to the purpose of the study and informed about their rights to interrupt the interview at any time. Confidentiality was maintained at all levels of the study. Pregnant women who were found to have anemia were referred for further investigations.

Data collection and study instrument: Data regarding family and personal characteristics were recorded by interview technique by the principal investigator using predesigned & pretested semi structured questionnaire. This data collection tool used for the study was an interview schedule that was developed at the Institute with the assistance from the faculty members and other experts for socio-demographic profile and social support had variables relating to family and personal characteristics like age, type of work, religion, education, parity, gestational age, birth spacing, type of family, dietary habit, calories and protein intake. By initial translation, back-translation, retranslation followed by pilot study, the questionnaire was custom-made for the study. The pilot study was carried out at the outpatients department of the Institute among comparable subjects attending obstetrics and gynecology outpatient department for the treatment of other disease, following which some of the questions from the interview schedule were modified. For assessment of anaemia, blood sample was taken by finger prick and Haemoglobin estimation was done by Sahli's method.

For the present study, the following operational definitions were used;

Pregnant woman: a woman whose pregnancy is confirmed by HCG test or abdominal examination and fetoscope at the study health center.

Normal: Haemoglobin level of more than or equal to 11 mg/dl was considered as normal.⁹

Anemia in pregnancy: Any women with a Hb level of less than 11mg/dl was considered anemic⁹.

Classification of anemia in pregnant women: As recommended by the Indian Council of Medical

Research (ICMR)⁹. Mild, moderate and severe anemia was defined as follows: 1. Mild anemia: Hb 10.0mg/dl-10.9 mg/dl., 2. Moderate anemia: Hb 7.0mg/dl-10.0 mg/dl., 3. Severe anemia: Hb less than 7mg/dl., 4. Very severe anemia: Hb less than 4mg/dl.

All the participants were explained about the purpose of the study and were ensured strict confidentiality. Written informed consent in their vernacular was obtained from each participant prior to participate in the proposed study and were given the options not to participate in the study if they wanted.

Data processing and analyses: Data were analysed using Microsoft® Excel and Epi-Info 7. Bivariate analysis was done to see the association of each in-

dependent variable with the outcome variable. The association between anaemia and its independent variable was examined by percentage and association was analyzed by the chi-square test. A *p*-value of less than 0.05 was considered statistically significant.

RESULTS

For this study population, Mean, Standard deviation and standard error of general profile of study participants were calculated and presented in table 1. Participants mean age was 23.58 years, parity 2.38, Gestational period 27.36 weeks, Interval between previous & index pregnancy 1.267 years, calorie intake 2032.30 Kcal per day and protein intake was 66.52 grams per day (Table 1).

Table 1 General profile of study participants

Variable /Characteristics	Minimum	Maximum	Mean	SD	SE
Age(Years)	16	34	23.58	4.29	0.21
Parity	1	8	2.38	1.12	0.05
Gestational period(weeks)	12	36	27.36	5.70	0.28
Interval between previous & index pregnancy (Years)	0.4	3	1.267	0.56	0.03
Calorie/day(Kcal)	1409	2590	2032.30	201.23	10.05
Protein/day(gram)	25	99	66.52	12.03	0.60

Table 2: Prevalence and grade of anemia

Degree of Anemia	Haemoglobin (gm/dl)	Pregnant Women (%)	Total
Mild	10-10.9	242 (60.5)	354 (88.5)
Moderate	7-9.9	101 (25.3)	
Severe	<7	11 (2.8)	
Normal	>11	46 (11.5)	46 (11.5)

Table 2, calculated overall prevalence and degree of anemia for this study population. Total prevalence of anemia among pregnant women was 88.5%. Majority (60.5%) of pregnant women were suffering from mild type of anemia, while moderate degree of anaemia was 25.3% and severe degree of anaemia was 2.8%. (Table 2).

Univariate analysis was carried for the correlates of anemia among pregnant women in and presented in the table 3. The prevalence of anaemia was maximum in less than 18 years of age. Anemia among pregnant women observed significantly more among upper socioeconomic class, had lower education, higher parity, had more gestational period, having lower birth spacing, consuming food lower in calories and protein, belongs to nuclear family and Hindus. (Table 3).

DISCUSSION

The prevalence of anaemia in pregnancy is very difficult to gauge correctly as there is no uniform

standard laid down regarding the normal range of haemoglobin in pregnancy. Problem of anaemia is so intimately connected with the socio-economic and dietary habits in a community that large differences in prevalence and severity are bound to occur in a country like India. In India, in spite of major nutritional intervention program for last five decades, there is need for community based sensitization strategy to improve maternal nutritional status, literacy level, utilization of health services and health education with emphasis on delaying marriage and conception, regular antenatal visits

The prevalence of anaemia in pregnancy found in this study was 88.5% and almost 60 % were suffering from mild degree of anaemia. Other studies like study H.K. Cheema et al reported 65.6%¹⁰, Ahmad N et al reported 74.8%.¹¹ Pathak P et al in Delhi slum area reported 85.4%¹², Toteja GS et al¹³ reported 84.9%¹³, R.G Viveki et al reported 82.9%.¹⁴

Age: In young age mother prevalence of anemia was higher. Similar observation made by Noronha JA et al¹⁵, H.K. Cheema et al¹⁰, Ahmad N et al¹¹, Alem M, et al.¹⁶

Socioeconomic and education, dietary habit: In this study problem of anemia among pregnant women was more belong to lower socio economic status and less educated, and consuming less calories and less protein rich diet. Similar observation made by Noronha JA et al¹⁵, H.K. Cheema et al¹⁰,

Table 3: Correlates of anaemia among pregnant women: univariate analysis

Variables	Anaemic 354 (88.5%)	Non-anaemic 46 (11.5%)	ODDs ratio (95%CI)	p-value
Age group				
<18	054 (15.25)	00 (0.00)		0.0393
18-24	143 (40.40)	25 (54.35)	0.4767 (0.1363-1.6672)	0.3561
25-29	121 (34.18)	18 (39.13)	0.5602 (0.1561-2.0101)	0.5362
≥ 30	036 (10.17)	03 (6.52)	1	
Type of work				
Light	135 (38.14)	15 (32.61)	1.7143 (0.6795-4.3246)	0.2494
Moderate	177 (50.00)	23 (50.0)	1.4658 (0.6129-3.5059)	0.3878
Hard	042 (11.86)	08 (17.39)	1	
Religion				
Hindu	120 (33.90)	13 (28.26)	2.2732 (1.1431-4.5207)	0.0170
Muslim	234 (66.10)	33 (71.74)	1	
Socio-economic status				
Class-1	046 (12.99)	12 (26.09)	0.0710 (0.0089-0.5669)	0.0044
Class-2	076 (21.47)	11 (23.91)	0.1279 (0.0160-1.0207)	0.0512
Class-3	078 (22.04)	10 (21.74)	0.1444 (0.0180-1.1617)	0.0781
Class-4	100 (28.25)	12 (26.09)	0.1543 (0.0195-1.2189)	0.0873
Class-5	054 (15.25)	01 (2.17)	1	
Educational status				
Illiterate	051 (14.41)	01 (02.17)	255.000 (21.0498-8089.097)	<0.001
Just literate	090 (25.41)	04 (08.69)	112.500 (18.2497-693.5035)	<0.001
Primary	060 (16.94)	04 (08.69)	75.0000 (12.0954-465.0518)	<0.001
Middle	064 (18.08)	05 (10.87)	64.0000 (10.9001-375.777)	<0.001
High School	056 (15.82)	06 (13.04)	46.6667 (8.2235-264.824)	<0.001
Sr. School	018 (05.08)	07 (15.21)	12.8571 (2.2313-74.0868)	0.0049
Graduation	013 (03.67)	09 (19.56)	7.2222 (1.2678-41.1441)	0.0434
Post-graduation	002 (0.56)	10 (02.17)	1	
Parity				
1-2	261 (73.73)	41 (89.13)	0.3423 (0.1313-0.8922)	0.0355
3 & more	093 (26.27)	05 (10.87)	1	
Gestational age in weeks				
<20	042 (11.86)	10 (21.74)	0.3424 (0.1438-0.8152)	0.0121
20-28	128 (36.16)	21 (45.65)	0.4969 (0.2468-1.0006)	0.0469
29-40	184 (51.98)	15 (32.61)	1	
Birth Spacing in years				
<1 Yr	135 (38.14)	08 (17.39)	6.0268 (2.3890-15.2037)	<0.001
1-2 Yrs	177 (50.00)	23 (50.00)	2.7484 (1.3214-5.7165)	0.0054
>2 Yrs	042 (11.86)	15 (32.61)	1	
Type of family				
Nuclear	208 (30.51)	12 (10)	4.0365 (2.0220-8.0582)	<0.001
Joint	146 (87.86)	34 (12.14)	1	
Dietary habit				
Vegetarian	185 (52.26)	30 (65.22)	0.5606 (0.1878-1.6738)	0.4171
Non-Vegetarian	125 (35.31)	12 (26.09)	1.1365 (0.3391-3.8084)	1.0000
Occasional Non-Veg	044 (12.43)	04 (08.69)	1	
Calories Intake				
<2000	168 (98.82)	02 (1.17)	19.8710 (4.7441-83.2302)	<0.001
≥2000	186 (80.87)	44 (19.13)	1	
Protein Intake				
<65 gm	168 (97.67)	04 (2.32)	9.4839 (3.3300-27.0098)	<0.001
≥65 gm	186 (81.570)	42 (18.42)	1	

Ahmad N et al¹¹, Alem M, et al.¹⁶ Positive association with primary education and no association with income reported by the Elzahaf R A et al.¹⁷

Stage of pregnancy: Prevalance of anemia was more in women going through latter stage of pregnancy, shorter birth space and more number of children in this study. Similar observation made by Judith A. Noronha et al¹⁵, Ahmad N et al¹¹, Alem

M et al¹⁶, But Parity and gestational age was not associated reported by the Elzahaf R A et al.¹⁷ Prevalance of anemia was more in women consuming vegetarian diet. Similar observation made by H.K. Cheema et al¹⁰ and Ahmad N et al.¹¹

Type of family: In this study family type not a significant factor but anemia was reported more in pregnant women belong to joint family reported

H.K. Cheema et al¹⁰, Anemia more common in nuclear family reported by Ahmad N et al.¹¹

Limitations of the study: We did not consider other factors like parasitic infections which can lead to anaemia. We were therefore not able to determine their contribution to anaemia in our study population. Being a cross sectional study, we could not identify the cause and effect relationship.

CONCLUSION

The magnitude of anaemia among pregnant women was exceptionally high and it was positively influenced by various social factors like young age mother going through repeated pregnancy with lower birth spacing and belongs to poor educational and socioeconomic status.

RECOMMENDATIONS

For substantial impact on this burden, unique preventive health care strategies need to be formulated. Holistic researches are needed on all other related factors as with current knowledge and intervention, still majority of pregnant women suffering from anaemia. There is need for community based strategy to improve maternal nutritional status, literacy level, utilization of health services and health education with emphasis on delaying marriage and conception, regular antenatal visits, Personal hygiene.

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