Original Research Article

Prevalence and factors associated with Anemia among pregnant women in a rural area of Katihar district, Bihar

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Abstract

Introduction: Anemia is a severe public health problem and more prevalent in pregnant women, particularly in developing countries like India. The prevalence of anemia among pregnant women is 56% in developing countries, as reported by World health organization. According to National family Health survey-5 factsheet, the prevalence of anemia is 63.9% in rural areas of Bihar.

Objectives: 1. To find out the prevalence of anemia among women in rural area. 2. To study the factors associated with anemia among pregnant women.

Methodology: This cross-sectional study was carried out among 217 pregnant women registered at our Rural Health Training Centre. All these pregnant mothers gave informed consent to participate in the study. A structured interview schedule was administered and hemoglobin levels were recorded from their Mother Child Protection Card. A mean hemoglobin value was calculated and anaemia was defined as a Hemoglobin level <11 g/dl as per WHO classification.

Results: The overall prevalence of anemia among pregnant women was 81.57% in the rural area. Factors such as age, educational status, diet, type of family and gravidity influencing its causation.

Conclusion: The high prevalence of anemia among pregnant women in rural area is a major public health problem. Awareness regarding factors associated with anemia is very important. There is need to be strict implementation of National Nutritional Anemia Prophylaxis programme in rural areas.

Keywords: Anemia, Rural, Pregnancy.

Introduction

Nutritional deficiency anemia is the most common disorder during pregnancy, affecting 56% of all women living in developing countries.[1] In pregnancy the most common haematological disorder is Iron deficiency anemia. Prevalence of anaemia in South Asian countries is among the highest in the world, and India has the highest prevalence of anaemia (87%). Among pregnant women prevalence of anemia in developing countries varies from 35% to 75% (average 56%) and in industrialized countries 18% of women are anemic.[2, 3]. According to National Family and Health

Survey (NFHS)-5 in Bihar 63% of pregnant women were anemic.[4]

In majority of cases, anemia is responsible for a number of maternal and foetal complications. Anemia leads to decrease in women's reserve to tolerate bleeding either during or after delivery. It is associated with low birth weight, premature delivery, intrauterine growth retardation and overall contribute to increased perinatal mortality.[5,6,7,8] Increased risk of birth asphyxia and low APGAR Score at birth also associated with anemia.[9] A recent meta-analysis showed that for every 1gm/dl increase in haemoglobin concentration, there is 20% decline in risk of maternal mortality. This declining trend is continuous between Hb levels 5 and 12mg/dl but not linear.[10] Thus to improve maternal and foetal outcome, treating anemia has major health implication in pregnancy.

Multiple factors like poor socioeconomic status, short birth interval, high parity, poor diet both in quality and quantity, lack of awareness regarding health and nutrition, high rate of infectious diseases and parasitic infestations are associated with anemia. limited access to medical care and preventive measures by underprivileged people in developing countries increases the risk of becoming anemic and thus contributing to high maternal mortality .[11,12] Various studies among pregnant women highlighting the problem of anemia has been conducted in this area showed indecisive findings, hence, this study was undertaken with an objective to determine the prevalence of anemia and factors influencing its causation among pregnant women.

Methodology

Study design: This is a community based cross sectional descriptive study.

Study area: This study was carried out in Hazipur, the rural field practice area of Katihar medical college in Katihar district of Bihar. The desired information was collected on a predesigned, interview schedules. Voluntary, written consent was obtained from all subjects. Data was analyzed using Epi-Info. As this study did not involve any patients or patient's records, the institutional ethical committee intimated that ethical clearance was not required.

Study population: All the pregnant mothers attending the Rural Health Training Center, Sripuram were defined as the study population.

Sample size: According to NFHS-5 data, the prevalence of anaemia among pregnant women in rural area of Bihar was estimated to be 63.9%.4 At 95% confidence limits and with 10% limit of accuracy, the sample size was estimated as 216.95 based on the formula N =3.84PQ/L2. The final sample size was rounded off to 217.

Study period: Seven months from January to August 2018.

Sampling method: All the pregnant mothers who were registered in the Rural Health Training Center, Hazipur, in Katihar district between 1st January 2018 and 31st July were listed out from the antenatal register available at RHTC. A total of 287 women were registered during this period. The list of all the antenatal women was prepared, and the 217 participants were selected using simple random sample technique for the study.

Tool for data collection

A Pre-tested, structured interview schedule was prepared to elicit questions related to socio-demographic factors of the study group. Data related to Haemoglobin level were recorded from the mother child protection card available with them. All the hemoglobin values were recorded and a mean value for each participant was calculated. The mean hemoglobin level was later categorized for the estimation of prevalence of anaemia.

Data collection methods

This community based cross sectional study was carried out among 217 pregnant mothers by making house visits to study the participants. The purpose of the study was clearly explained to them. Informed consent was obtained in local language before administering the structured interview schedule. The questions related to socio-demographic factors were collected from the mother and all the haemoglobin values were recorded from the mother child protection card.

Statistical analysis

The data was collected and entered in an Excel sheet. Then data was analyzed using Epi Info version 7. Prevalence of anaemia was expressed in frequencies.

Operational definition

According to World Health Organization, anaemia in pregnancy was defined as hemoglobin levels less than 11 g/dl.12. Further grading of anaemia is as follows:

Table 1: Grading of anaemia among pregnant women

S. No	Grading Of Anemia	Hemoglobin level (g/dl)
1	Mild anaemia	10-10.9
2	Moderate anaemia	7.0-9.9
3	Severe anaemia	<7.0

Observation & Results

Table 2: Sociodemographic profile of pregnant women

S.No	Particulars	Frequency (N=217)	Percentage
1	Age (Years)		
	<20	86	39.63
	20-30	81	37.33
	>30	50	23.04
2	Religion		
	Muslim	213	98.16
	Hindu	4	1.84
3	Educational Status		
	Illiterate	120	55.30
	Just Literate	87	40.09
	Primary	3	1.38
	Secondary	4	1.84
	Higher secondary and above	3	1.38
4	Socio- economic status		
	Upper class	2	0.92
	Upper middle class	7	3.23
	middle class	60	27.65
	lower middle class	111	51.15
	lower class	37	17.05
5	Pregnancy Duration		
	<12 Months	36	16.59
	12-24 Months	91	41.94
	>24 Months	90	41.47
6	Diet history		
	Vegetarian	23	10.60
	Mixed diet	194	89.40

7	Type of family		
	Nuclear	126	58.06
	Joint	91	41.94
8	Gravidity		
	Primigravida	135	62.21
	Multigravida	82	37.79

This study was carried out among 217 pregnant mothers of Hazipur, the rural field practice area of our Medical College and Hospital. Table 2 illustrates the demographic information of the respondents. Majority of the respondent belonged to the age group of less than 20 years (39.63%). This is indicative of the prevalent early marriages in the study area. Majority of study participants belongs to Muslim Community (98.16%). Regarding education, 55.30% participants were illiterate and 40.09% were just literate. Majority of study participants belongs to lower middle class (51.15%) as per Modified BG Prasad's Classification. More than half (58.06%) of the study subjects belonged to nuclear families and 41.94% to joint families. Regarding gravidity, 62.21% pregnancies were of primigravida, and 37.79% multigravida.
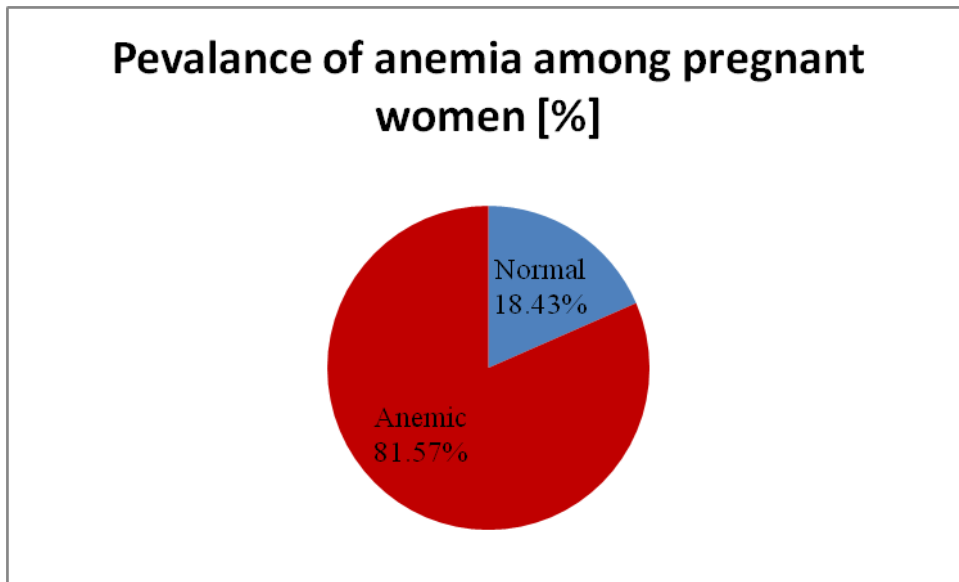

Figure 1: Prevalence of anaemia among the study participants

Prevalence of anemia among the study participants is given in Figure 1. It was observed that anamia (Hb<11 g/dl) was prevalent among 81.57% of the study participants.
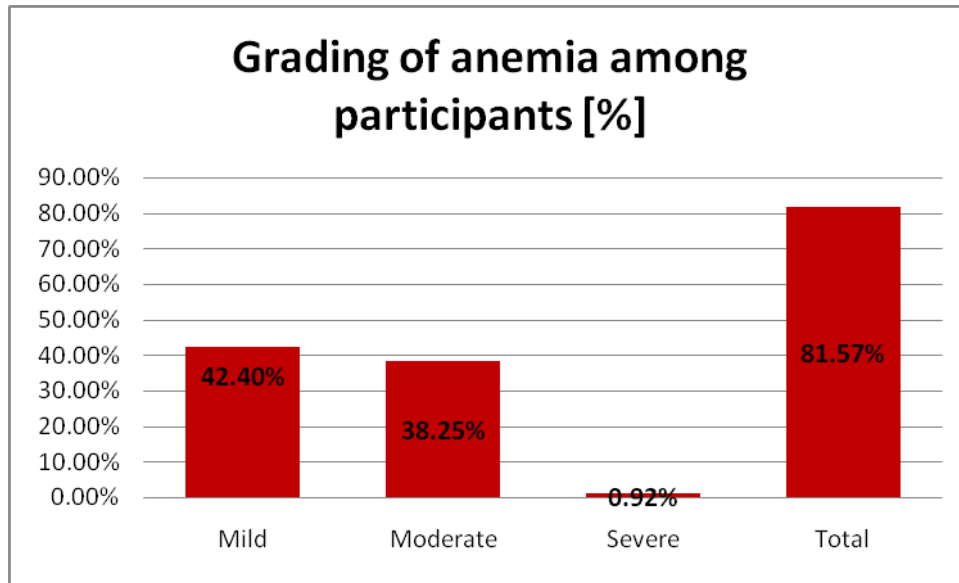
Figure 2: Grading of anemia among Participants

Anaemia among the study participants was graded into mild, moderate and severe, based on their hemoglobin levels. This is illustrated in Figure 2. It was observed that 42.40% of the participants had mild anaemia,while 38.25% had moderate anaemia. Also, 0.92% of the study participants had severe anaemia.

Table: 3 Association of various demographic factors with anemia in pregnant women

S. No	Particulars	All pregnant women N=217(%)	No Anemia N=40(%)	Mild Anemia N=92(%)	Moderate Anemia N=83(%)	Severe Anemia N=2(%)	
1	**Age (Years)**						
	<20	86(100)	8(9.30)	18(20.93)	60(69.77)	0(0.00)	χ^2 = 20.94, df = 2, p <0.0001
	20-30	81(100)	12(14.81)	52(64.20)	16(19.75)	1(1.23)	
	>30	**50(100)**	**20(40.00)**	**22(44.00)**	**7(14.00)**	**1(2.00)**	
2	**Educational Status**						
	Illiterate	120(100)	7(5.83)	57(47.50)	55(45.83)	1(0.83)	χ^2 = 34.18, df = 4, p <0.0001
	Just Literate	87(100)	32(36.78)	30(34.48)	24(27.59)	1(1.15)	
	Primary	3(100)	0(0.00)	2(66.67)	1(33.33)	0(0.00)	
	Secondary	4(100)	0(0.00)	2(50.00)	2(50.00)	0(0.00)	
	Higher secondary and above	3(100)	1(33.33)	1(33.33)	1(33.33)	0(0.00)	
3	**Socio- economic status**						
	Upper class	2(100)	1(50.00)	1(50.00)	0(0.00)	0(0.00)	χ^2 = 14.2, df = 4, p <0.05
	Upper middle class	7(100)	4(57.14)	2(28.57)	1(14.29)	0(0.00)	
	middle class	60(100)	5(8.33)	35(58.33)	20(33.33)	0(0.00)	
	lower middle class	111(100)	20(18.02)	44(39.64)	46(41.44)	1(0.90)	
	lower class	37(100)	10(27.03)	10(27.03)	16(43.24)	1(2.70)	

4	Pregnancy Duration						
	<12 Months	36(100)	2(5.56)	9(25.00)	24(66.67)	1(2.78)	χ^2 = 4.88, df = 2, p >0.05
	12-24 Months	91(100)	20(21.98)	43(47.25)	27(29.67)	1(1.10)	
	>24 Months	90(100)	18(20.00)	40(44.44)	32(35.56)	0(0.00)	
5	Diet history						
	Vegetarian	23(100)	2(8.70)	10(43.48)	10(43.48)	1(4.35)	χ^2 = 0.98, df = 1, p >0.05
	Mixed diet	194(100)	38(19.59)	82(42.27)	73(37.63)	1(0.52)	
6	Type of family						
	Nuclear	126(100)	28(22.22)	61(48.41)	36(28.57)	1(0.79)	χ^2 = 2.3, df = 1, p >0.05
	Joint	91(100)	12(13.19)	31(34.07)	47(51.65)	1(1.10)	
7	Gravidity						
	Primigravida	135(100)	32(23.70)	37(27.41)	66(48.89)	0(0.00)	χ^2 = 5.71, df = 1, p <0.05
	Multigravida	82(100)	8(9.76)	55(67.07)	17(20.73)	2(2.44)	

The prevalence of anemia in pregnant females in the age group less than 20 years was 90.70%. Out of the total anemic women in this age group 20.93% had mild anemia, 69.77% had moderate anemia. 9.30% had haemoglobin >11 gm in this group. In women between 20-30 years age group, the prevalence of anaemia was 85.19%. Among these, 64.20% and 19.75% had mild and moderate anemia respectively. Whereas in women over the age of >30 years, the prevalence was of anaemia was 60%. Among these, 44.00% and 14.00% had mild and moderate anemia respectively.

47.50% of total illiterate pregnant females had mild anemia, 45.83% had moderate anemia and 0.83% had severe anemia whereas no case of very severe anemia was found among females literate above primary level. The prevalence of mild and moderate anemia was 34.48% and 27.59% among females just literate. Similarly, the prevalence of mild and moderate anemia was 66.67% and 33.33% among females educated up to primary level. Almost half of the women (50.00 %) have mild and moderate anemia respectively, educated up to secondary level. The prevalence of

anemia was maximum (91.67%) among lower socioeconomic status followed by lower middle class (81.98%).

The prevalence of anemia among pregnant females was maximum (94.44%) in first trimester among which 25.00% had mild anemia and 66.67% had moderate anemia. In second and third trimester the prevalence of anemia was 78.02 and 80.00% respectively.

The prevalence of anemia was high among vegetarians (91.30%) as comparison to those having mixed diet (80.41%). Similarly, prevalence of anemia was maximum among Joint families (86.81%) as comparison to nuclear families (77.78%).

Maximum participant in this study were belonging to primi-gravida (62.21%) among whom 76.3% had anaemia while among the multi-gravida (37.79%) the level of anaemia was 90.24%.

Discussion

According to this study, the prevalence of anemia among pregnant women was 81.57%. Studies conducted by Kaul et al and Mangal M et al in rural Haryana also

observed a high prevalence of anemia among pregnant women i.e., 91% and 98% respectively [13,14]. Another study conducted by Ivan et al also reported high prevalence of anemia (83%) among pregnant women [15]. There is various reason for high prevalence of anemia in this region. The contributory factors are low dietary iron and folic acid intake and reduced bioavailability due to infections. In rural areas women do not have permission to take their own decisions regarding age of marriage, or timings and spacing of child birth.

In this study, the prevalence of mild, moderate and severe anemia was observed as 42.40%, 38.25% and 0.92% respectively, which is similar to study done by Mangla et al.[14] The contributory factors to various degree of anemia are poverty, ignorance and failure to utilize available health care facilities.

In this study nearly 94.44% of the first trimesters were anaemic, while 78.02 % of the second trimesters and 80% of the third trimesters were anaemic. In a study done by Kumar et al, at Mysore found that 55.3% of the mothers were anaemic in the first trimester.[16]

Among pregnant women belongs to lower and lower middle class socioeconomic status anemia is more prevalent. Similar observation was made in a study conducted by Lokare et al.[17] Health education and improvement in health care delivery lead to increased utilization of available health care facilities by the beneficiary will help in decreasing the prevalence of anemia. There is negative correlation of hemoglobin level of pregnant women with gravida. Similar observation reported among pregnant women by Gatea et al in Baghdad.[18] Repeated pregnancy lead to increased requirement of Iron that lead to decreased hemoglobin level. Anemia was found to be more in uneducated group in this study. According to Dutta et al significant association was found between literacy status and anemia .[19]

Table-3 shows that dietary habits have influence on anaemia. The vegetarian group of pregnant women were maximum (40.14%) with anaemia as compared with having mixed dietary habits (18.21%). In similar study by Baig Ansary.N, Badruddin SH it was stated in the literature that tea consumption and low intake of red meat were associated with anaemia.[20]

Conclusion

In rural area, high prevalence of anemia (81.57%) reflects that anemia will remain as a major public health problem. The major determinants for this problem are socioeconomic status, women literacy status, multiple pregnancies and poor diet. Nutritional deficiency can be reduced by food fortification. Timely interventions needed to reduce the burden of malaria, parasitic infestations and other infectious diseases. All health care providers need to be motivated to prescribe iron preparations with emphasis on balanced diet.

Strength

The sample size is large enough to avoid the biases. Based on observations an attempt was made in community for behavioural change regarding anemia.

Limitations

Only those pregnant women included in this study, those were attending the ante natal clinic. The prevalence may be different in general population.

Recommendations

There is need to develop strategies for intensive adult education and to improve the socio-economic status of the population through poverty alleviation programs. This should be supported by programs for the prevention of anaemia through nutrition education and anaemia prophylaxis. Interventions to prevent and correct iron deficiency anaemia, therefore must include measures to increase iron

intake through food-based approaches, namely dietary diversification and food fortification with iron; iron supplementation and by improved health services and sanitation. There is need to birth control for proper spacing of pregnancies. Thus, it can be concluded that the area needs a community-based strategy for the improvement of an adolescent girl's nutritional status.

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