Anemia among Pregnant Women in a Rural Area of Katihar District, Bihar

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ABSTRACT

Anemia is a major public health problem affecting both the developed as well as the developing countries. According to World Health Organization, prevalence of anaemia among pregnant women is 56% in the developing world. India has the highest prevalence of anaemia and 20% of total maternal deaths are due to anemia. According to NFHS-5 data the prevalence of anemia in rural area of Bihar is 63.9%.

Objectives: *To study the prevalence of anaemia in rural pregnant women. To study the factors associated with anemia.*

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 prevalence of anemia was 81.57% among the pregnant females in this region of rural India. Out of these 42.20% had mild anemia, 38.25% had moderate anemia and 0.92% had severe anemia according to WHO classification of anemia.*

Conclusion: *High prevalence of anemia among pregnant women indicates anemia to be a major public health problem in the rural community and indicates strict implementation of national nutrition anemia prophylaxis programme.*

Keywords: Anemia, Rural, Pregnancy, Hemoglobin, Implementation

INTRODUCTION

Anaemia is the nutritional deficiency disorder and 56% of all women living in developing countries are anaemic (World Health Organization) [1]. It is the most common haematological disorder during pregnancy. Prevalence of anaemia in South Asian countries is among the highest in the world and India has the highest prevalence of anaemia (87%). According to the reports of World Health Organization, in developing countries, 35% to 75% (56% on average) of pregnant women and in industrialized countries, 18% of women are anemic [2,3]. National Family and Health Survey (NFHS)-5 reported that 63.1% of pregnant women in Bihar were anemic [4].

Anaemia has been known to be responsible for a number of maternal and foetal complications. Apart from decreasing the woman's reserve to tolerate bleeding either during or after child birth, it has been known to be associated with low birth weight, premature delivery, intra uterine growth retardation and thus increased perinatal mortality [5-8]. Anaemia has also been found to be associated with increased risk of birth asphyxia and low Apgar score at birth [9]. A recent meta-analysis showed that the risk of maternal mortality decreases by 20% for every 1 g/dl increase in the haemoglobin concentration. This decline is continuous between Hb levels between 5 and 12 mg/dl but not linear [10]. Thus treating anaemia has major health implications in pregnancy and would go a long way in improving maternal and foetal outcome.

Anemia is known to be associated with multiple factors, such as poor socioeconomic status, high parity, short birth interval, poor diet both in quantity and quality, lack of health and nutrition awareness and a high rate of infectious diseases and parasitic infestations. In developing countries, underprivileged people have often limited access to medical care and preventive measures, increasing their risk of becoming anemic and contributing to high maternal mortality [11,12]. Studies highlighting the problem of anemia among pregnant women in this region are very indecisive and hence, this study was undertaken with an objective to determine the prevalence of anemia and factors influencing its causation among pregnant women.

MATERIALS AND METHODS

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%. At 95% confidence limits and with 10% limit of accuracy, the sample size was estimated as 216.95 based on the formula N=3.84 PQ/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 (Table 1). 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

RESULTS

It results show in Table 2.

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.

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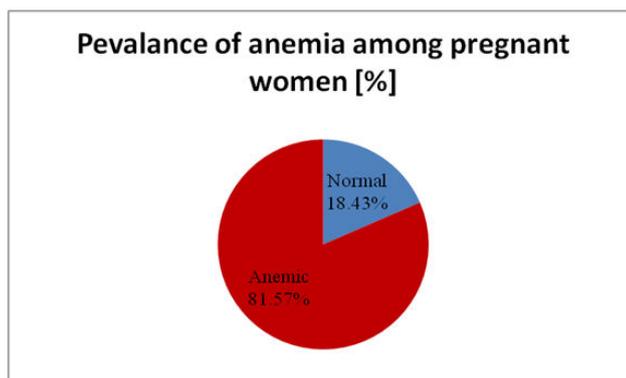

Figure 1 Prevalence of anaemia among the study participants.

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).
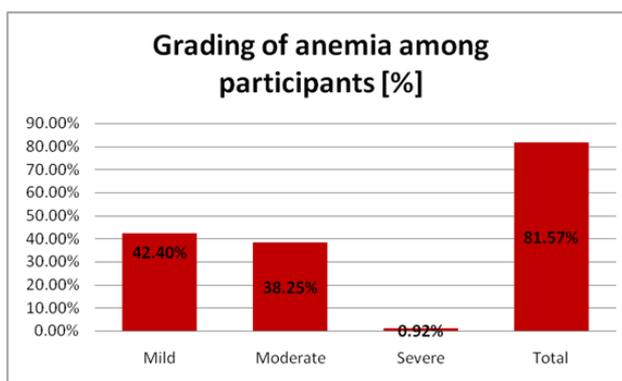

Figure 2 Grading of anemia among participants.

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 (%)	p-values
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 primigravida (62.21%) among whom 76.3% had anaemia while among the multigravida (37.79%) the level of anaemia was 90.24%.

DISCUSSION

In this study, the prevalence of anemia in pregnant women was 81.57%, as also reported by Kaul, et al. and Mangal M, et al. in rural Harayana in their study observed a very high prevalence of anemia *i.e.* 91% and 98% respectively [13,14]. Another study by Ivan et al. reported 83% of prevalence of anaemia [15]. The reasons for high prevalence of anemia in this area are various. The high prevalence of anemia can be attributed to low dietary iron and folic acid intake or deprived bioavailability of iron or chronic blood loss owing to infections. Women in rural areas rarely get to choose when they can marry, or regarding 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 comparable with the study conducted by Mangla M. Poverty, ignorance and non-availability or failure to utilise available medical facilities can be contributing to various degree of anemia.

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].

Anemia was predominantly seen among pregnant women belonging to lower and lower middle class families compared with families belongs to upper class. Similar observation was made in a study conducted by Lokare, et al. [17]. Improvement in health care delivery system with health education targeting improved utilization of availability of healthcare facilities at the beneficiary door steps will help in reducing anemia prevalence. Hemoglobin level of pregnant women seemed to have a negative correlation with gravid. Gatea, et al. reported similar observation among pregnant women in Baghdad. Increased requirement of iron with repeated pregnancy had contributed to the decreased hemoglobin levels. Anemia was found to be more in uneducated group in this study. The impact of literacy status on anemia was also studied by Dutta, et al. and was found to be significant.

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 and Badruddin SH. It was stated in the literature that tea consumption and low intake of red meat were associated with anaemia.

CONCLUSION

A high prevalence of anemia (81.57%) indicates that the anemia continues to be a major public health problem in rural area. Socioeconomic status, literacy of women, gravida and diet are the major determinants that contribute to the problem of anemia. We have to rectify the nutritional deficiencies with Food fortification and timely interventions for reducing the burden of the malaria, worm infestations and other infectious diseases. All practitioners handling obstetrics cases should be motivated for prescribing iron preparations and balanced diet with good compliance.

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

Present study had certain limitations. Only patients coming to a single medical centre were included in this study. Patients in other parts of rural area may be having different prevalence of anaemia and different socio demographic factors contributing to the same.

RECOMMENDATIONS

Programs focused on target population need to be planned and implemented with active participation of locals. Some of the interventions that can be done are screening programs for anaemia, awareness campaigns, frequent visits by anganwadi workers to pregnant women, cooking in iron utensils, fortification of food and salt with iron and folic acid, birth control for proper spacing of pregnancies, deworming of such patients. Such measures would go a long way in improving maternal and foetal outcome.

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