

SHORT ARTICLE

Prevalence of anaemia and its socio demographic determinants among pregnant women in Bareilly district, Uttar Pradesh

Paramatma Singh¹, Varsha Chaudhary²

¹PG Resident, ²Associate Professor, Department of Community Medicine, Rohilkhand Medical College, Bareilly, India

Abstract	Introduction	Methodology	Results	Conclusion	References	Citation	Tables / Figures
--------------------------	------------------------------	-----------------------------	-------------------------	----------------------------	----------------------------	--------------------------	----------------------------------

Corresponding Author

Address for Correspondence: Dr. Paramatma Singh, PG Resident, Department of Community Medicine, Rohilkhand Medical College & Hospital, Bareilly
E Mail ID: drpmsingh1@gmail.com

Citation

Singh P, Chaudhary V. Prevalence of anaemia and its socio demographic determinants among pregnant women in Bareilly district, Uttar Pradesh. Indian J Comm Health. 2014;26, Suppl S2:348-352

Source of Funding : Nil **Conflict of Interest:** None declared

Abstract

Background: About one-third of the global population is anaemic. WHO has estimated that prevalence of anaemia in pregnant women is 18% in developed countries and relatively high 56% in developing countries. Prevalence of anaemia in South East Asian countries is highest in the world. WHO estimates that even among the South East Asian countries, India has the highest prevalence of anaemia. **Aims & Objectives:** To determine the prevalence of anaemia among pregnant women and to determine association of anaemia with its socio-demographic factors. **Material & Methods:** A descriptive cross sectional study was conducted among pregnant women 2nd trimester onwards who came to ante natal clinic of obstetrics and gynaecology department during January-March 2014 by using pre-designed, pretested schedule. A total of 300 pregnant women were clinically examined. Written consent was taken. Haemoglobin estimation was done by Cyanmethaemoglobin method and anaemia was graded according to WHO criteria. Statistical analysis was done using Microsoft Excel 2007 and SPSS Version 17. **Results:** Overall prevalence of anaemia among the pregnant women was found to be 58.3%. It was seen that 31% of women were illiterate and 38.7% of them belong to upper middle class. Factors such as level of education of women, occupation and consumption of Iron Folic Acid were found to be significantly associated with prevalence of anaemia in pregnancy. **Conclusion:** A very high prevalence of anaemia in pregnancy needs awareness about late marriage, birth spacing, one or two child norm, antenatal care, green leafy vegetable in diet, mandatory regular supply of IFA tablets to adolescent and pregnant women along with correction of other nutritional deficiencies.

Key Words

Anaemia; Pregnant women; Prevalence

Introduction

Pregnancy is a unique experience in every mother's life. The thought of a growing foetus in the mother's womb, indeed is nature's way of expressing the attributes of motherhood (1). About one-third of the global population is anaemic (2, 3). WHO has estimated that prevalence of anaemia in pregnant women is 18% in developed countries and relatively high 56% in developing countries (4). Prevalence of anaemia in South East Asian countries is highest in the world. WHO estimates that even among the South East Asian countries, India has the highest

prevalence of anaemia. Prevalence of anaemia in all the age groups is higher in India as compared to other developing countries (2). According to NFHS-III (2005-2006) prevalence of anaemia among pregnant women in India is 58% (5), which is higher as compare to the previous survey NFHS-II (1998-99) 49.7% (6). Anaemia in pregnancy is one of the most important public health problems not only in India but also in most of the developing countries in the form of abortion, premature birth, intra uterine growth retardation, high infant mortality and 20 to 40 percent maternal death of India (7). Anaemia

still continues to be a common cause of mortality and morbidity in India. Diminished intake and increased demands of iron, disturbed metabolism, pre pregnant health status and excess iron demands as in multiple pregnancies, women with rapidly recurring pregnancies, blood loss during labour, heavy menstrual blood flow, inflammation and infectious diseases, hook worm infection are important factors which lead to development of anaemia during pregnancy (8).

Aims & Objectives

1. To determine the prevalence of anaemia among pregnant women
2. To determine association of anaemia with its socio-demographic factors.

Material and Methods

The present cross sectional study was conducted among pregnant women who attended antenatal clinic of obstetrics & gynaecology department of Rohilkhand Medical College & Hospital, Bareilly. Sample Size: Minimum sample required for the study was calculated with the help of Methods in Biostatistics 7th Edition by BK Mahajan at 10% allowable error and 95% confidence limit, based on the knowledge that about 58% of pregnant women in the country are anaemic (5). Ethical approval for the study was obtained from the ethical committee at Rohilkhand medical college & hospital Bareilly. All the pregnant women (300) from second trimester onwards who attended the centre for ANC check-up for the first time during study period were included. The study was carried out during January to March 2014. Informed consent was obtained from them after explaining the purpose of the study. Who fail to give consent, were excluded from study. A detailed demographic profile of the women like age, religion, type of family, education level of women & her husband, occupation of a women & socioeconomic status was collected. After through clinical examination, haemoglobin estimation was done by Cyanmethaemoglobin method. Socioeconomic classification suggested by modified BG Prasad classification (July 2009) was adopted. Anaemia in pregnancy is defined by WHO as a haemoglobin concentration below 11g/dl. The degrees of anaemia studied were mild anaemia (10–10.9 g/dL), moderate anaemia (7.0–9.9 g/dL), and severe anaemia (less than 7.0 g/dL) (9, 10). Statistical Analysis: The collected data was compiled & tabulated using Microsoft Excel 2007 and then

analyzed using SPSS Version 17. Group comparisons were done by Chi-square test. P values less than 0.05 were considered significant.

Results

Demographic characteristics of study participants: [Table 1](#) shows that women had an average age of 24.94±4.19 yrs ranging from 17 to 40 yrs. Majority of the women were in the age range of 20-30 years. 88.7% women were housewives, 69% women were literate and 31% illiterate. According to modified B.G. Prasad's Classification majority (38.7%) of women belonged to Upper middle class followed by 37.7% lower middle. [Table 2](#) shows that 58.3% were found anaemic. Mild anaemia was found among 29% of women followed by moderate anaemia (24%). Thus prevalence of mild & moderate anaemia was found to be high in comparison to severe anaemia. About 55.3% women received IFA tablets while 44.7% didn't received tablets. [Table 3](#) revealed that the prevalence of anaemia was highest in age group more than 30 years (85%) and lowest in age group less than 20 years. The association between age and anaemia was statistically significant ($P < 0.001$). The pregnant women suffering from anaemia was 74.2% in illiterate group as compared to 51.2% in literate women. There was a positive association between anaemia and literacy status of women. This relationship was found to be statistically significant ($P < 0.05$). Table also showed Class V (poor) had highest prevalence of anaemia (80%). As socio-economic class upgrade the prevalence of anaemia was reduced. This association between socioeconomic status of family and anaemia in pregnancy was found to be statistically significant ($P < 0.001$). [Table 4](#) revealed that 55.3% received IFA tablets. The prevalence of anaemia was 48.8% among women taking IFA in comparison to 70.1% not taking IFA. The severity of anaemia is 10.4% among women taking not IFA whereas only 1.2% in other group. The duration of IFA consumption was also important. The association between IFA consumption and its duration with anaemia was statistically significant ($P < 0.001$).

Discussion

Although lots of efforts has been taken to prevent anaemia among pregnant women by Gov. of India, still the prevalence of anaemia during pregnancy was found to be 58.3% from present study which was similar to the study done by Mahashabde P. et al 2014(62.7%) (11). NFHS-2 (National Family Health

Survey, 1998-1999) (6) reported a prevalence of anaemia was 49.7%. In present study it was found that anaemia was significantly associated with level of educational attainment (74.2% among illiterate and 51.2% among literate) which was similar to study of Mahashabde P et al 2014 (11) where anaemia was more common in illiterate women (81.16%) as compared to literate women 57.15%. The women who were under peak child bearing age as well as low income group have more chances to experience anaemia. Prevalence of severe anaemia among the study participants was 5.3%. In other similar studies in India severe anaemia was found in 13.1% by G.S. Toteja et al (12), 3.2% by Langare SD et al (13) and only 1.6% by Kapil U et al (14). Severity of anaemia in present study was inversely related to educational status and socio-economic class which was similar to studies conducted by Swarnlatha N. 2013 (15), Singh AB et al 2009 (16). As per IFA tablet supply and received, 55.3% had received IFA tablets. Shidhaye PR et al (2012) (17) found that 57.6% had received IFA tablets. Lower anaemia prevalence (48.8%) was observed among women taking IFA supplements than those not consuming the same (70.1%) as seen in present study.

Conclusion

The overall prevalence of anaemia and severity of anaemia in the present study is 58.3% and 5.3% respectively. Age, socio-economic status, literacy of women, parity and birth interval are the major determinants that contribute to the problem of Anaemia. Anaemia continues to be endemic among pregnant women in all states of India, despite the intervention measures like Nutritional Anaemia control Programme. Some of the reasons that Iron supplementation programmes are ineffective may be because of awareness, failure of effective distribution of IFA tablets and non-compliance by pregnant women.

Recommendation

More efforts are directed towards elderly mothers, Legislative and other efforts should be made to prevent early marriage and early pregnancy. Increases the educational status of women and adolescent girls, implementation of awareness programme for healthy reproductive life, child birth, birth spacing, antenatal care, small family norm and early registration of pregnancy, nutritional anaemia control programme, monitoring the compliance of women with ante-natal care services, strengthening

of their health care seeking behaviour, IFA tablets consumption and institutional deliveries are important health care measures to be undertaken. Compulsory nutrition education should be given to pregnant women during their every antenatal visit about daily consumption of green leafy vegetables, cheap iron rich food items and fruits. Iron supplements should be given to adolescent girls to prevent future anaemia. More emphasis should be given on early deworming, consumption of IFA and other micro nutrients especially under supervision of health worker during pregnancy.

Limitation of the study

1. Emergency obstetric cases were not included in the study.
2. Stool examination for ova or worms of helminthic parasite was not possible in OPD pregnant women.
3. Peripheral blood examination for classification of anaemia as microcytic or macrocytic anaemia (iron deficiency or folate deficiency) was not done.

Relevance of the study

The study support the statement- there is no decrease in the prevalence of anaemia among pregnant women even after 44 years of launching of national nutritional anaemia prophylaxis programme by government of India.

Authors Contribution

PS: Concept and design, acquisition of data, analysis and interpretation of data, drafting the article, revising it critically for important intellectual content, final approval of the version to be published. VC: Analysis and interpretation of data, drafting the article and final approval of the version to be published.

Acknowledgement

Authors extend sincere thanks to all the faculty of the Department of Community Medicine for help and encouragement. Authors also thanks to nursing staff of department of obstetrics and gynaecology, Rohilkhand medical college and hospital, Bareilly for their support and co-operation. Authors are grateful to the Chairman of ethical committee Rohilkhand Medical College for permitting to conduct the present study. Authors extend heart full thanks to all PG students of the Department of Community Medicine for their vulnerable support.

References

- Upadhyay C, Bulusu R, Shah N. A prospective study on prevalence and management of anaemia in pregnancy with perinatal outcome. *Journal of Evolution of Medical and Dental Sciences* 2013; 2(35): 6664-72.
- Kalaivani K. Prevalence & consequences of anaemia in pregnancy. *Indian J Med Res.* 2009; 130: 627-33.
- World Health Organization (2004). Micronutrient deficiency: Battling iron deficiency anaemia: the challenge. Available from: <http://www.who.int/nut/ida.htm>, accessed on July 11, 2014.
- World Health Organization (1992). The prevalence of anaemia in women: A tabulation of available information. 2nd ed. Geneva, Switzerland: WHO. (WHO/MCH/MSM/92.2), accessed on July 11, 2014.
- Nutritional anaemia. National Family Health Survey 2005-06, Volume 1. (NHFS 3) Ministry of health and family welfare, Government of India, New Delhi 2007:308-09.
- NFHS -2 India. National Family Health Survey-2 (1998-99) - Anaemia among women and children. Mumbai: International Institute for Population Sciences; 2000.
- Bisoi S, Haldar D, Majumdar TK, Bhattacharya N, Sarkar GN, Ray SK. Correlates of anaemia among pregnant women in a rural area of West Bengal. *Journal of Family Welfare* 2011; 57(1):72-78.
- Viveki RG, Halappanavar AB, Viveki PR, Halki SB, Maled VS, Deshpande PS. Prevalence of anaemia and its epidemiological determinants in pregnant women. *Al Ameen J Med Sci* 2012; 5 (3): 216-23.
- Guidelines for control of iron deficiency anaemia. Adolescent Division, Ministry of health and family welfare, government of India. New Delhi 2013: 02.
- World Health Organization (WHO). Haemoglobin concentration for the diagnosis of anaemia and assessment of severity. Report of vitamin and mineral nutrition information system. Geneva, Switzerland: WHO; 2011 (WHO/NMH/NHD/MNM/11.1).
- Mahashabde P, Arora VK, Sharma S, Shahjada A, Dabhi HM. Prevalence of anaemia and its sociodemographic determinants in pregnant women: a cross-sectional study in tertiary health care setup in central india. *Nutritional journal of community medicine* 2014; 5(1): 126-30.
- Toteja GS, Singh P, Dhillon BS. Prevalence of anaemia among pregnant women & adolescent girls in 16 districts of India. *Food & Nutrition Bulletin* 2006; 27(4): 311-15.
- Langare SD, Rajderkar SS, Naik JD, Patil V. A Cross Sectional Study to Assess Certain Determinants Co-related with Anaemia in Pregnant Women attending Antenatal Clinic at rural Health Training Centre in Western Maharashtra. *Nat J Community Med* 2013; 4(3): 454-56.
- Kapil U, Pathak P, Tandon M, Singh C, Pradhan R and Dwivedi SN. Micronutrient deficiency disorders amongst pregnant women in three urban slum communities of Delhi. *Indian Pediat.* 1999; 36:991-98.
- Swarnlatha N. Prevalence of anaemia and its socio demographic determinants among pregnant women attending government maternity hospital, Tirupati, A.P. *Sudanese journal of public health.* 2013; 8 (3): 104-06 .
- Singh AB, Kandpal SD, Chandra R, Srivastava VK , Negi KS. Anaemia amongst pregnancy and lactating women in district Deharadun. *Indian. J. Pre. Soc. Med..* 2009; 40(1): 19-22.
- Shidhaye PR, Giri PA, Nagaonkar SN, Shidhaye RR. Prevalence of anaemia in postnatal women at a tertiary care teaching hospital in Mumbai. *J Med Nutr Nutraceut* 2012; 1: 54-57

Tables

TABLE 1 SOCIO DEMOGRAPHIC DISTRIBUTION OF PREGNANT WOMEN

Maternal characteristics	Number of subjects(n=300)	Percentage (%)
Age in years		
< 20	12	4
20-30	269	89.7
> 30	19	6.3
Range of age 17- 40years, Mean=24.94, SD= ±4.19		
Profession		
Studying	2	0.7
Service	32	10.7
House wife	266	88.6
Education		
Illiterate	93	31
Literate	207	69
Socio-economic class		
Class- I (Upper high)	17	5.7
Class- II (High)	49	16.3
Class- III (Upper middle)	116	38.7
Class- IV (Lower middle)	113	37.6
Class- V (Poor)	5	1.7

TABLE 2 DISTRIBUTION OF PREGNANT WOMEN ACCORDING TO ANAEMIA AND IRON FOLIC ACID INTAKE

Maternal characteristics	Number of subjects(n=300)	Percentage (%)
Haemoglobin (gm %)		
Normal (≥11)	125	41.7
Any anaemia (<11)	175	58.3
Mild (10-10.9)	87	29
Moderate (7-9.9)	72	24
Severe (<7)	16	5.3
Iron folic acid tablets intake (IFA)		
Yes	166	55.3
No	134	44.7

TABLE 3 ASSOCIATION OF ANAEMIA WITH SOCIO-DEMOGRAPHIC FACTORS

Maternal Characteristics	Normal (n=125)	Any Anaemia (n=175)	Severity of anaemia			Total (n=300)	P value
			Mild (n=87)	Moderate (n=72)	Severe (n=16)		
Age (years)							
<20	5 (4.5%)	6 (54.5%)	6 (54.5%)	0 (0%)	0 (0%)	11(100%)	< 0.001
20-30	117(43.5%)	152(56.5%)	77 (28.6%)	64 (23.8%)	11 (4.1%)	269(100%)	
>30	3 (15%)	17 (85%)	4 (20%)	8 (40%)	5(25%)	20(100%)	
Education of pregnant women							
Illiterate	24 (25.8%)	69 (74.2%)	30 (32.3%)	29 (31.2%)	10 (10.8%)	93(100%)	0.004
Literate	101(48.8%)	106(51.2%)	57 (27.5%)	43 (20.8%)	6 (2.9%)	207(100%)	
Occupation							
Studying	0 (0%)	2 (100%)	1 (50%)	1 (50%)	0 (0%)	2(100%)	0.664
Employee	15 (46.9%)	17 (53.1%)	10 (31.3%)	7 (21.9%)	0 (0%)	32(100%)	
Housewife	110(41.4%)	156 (58.6%)	76 (28.6%)	64 (24%)	16 (6%)	266(100%)	
Socio-economic class							
Upper high	11 (64.7%)	6 (35.3%)	5 (29.4%)	1 (5.9%)	0 (0%)	17(100%)	< 0.001
High	31 (63.3%)	18 (36.7%)	9 (18.4%)	9 (18.4%)	0 (0%)	49(100%)	
Upper middle	48 (41.4%)	68 (58.6%)	38 (32.8%)	27 (23.3%)	3 (2.6%)	116(100%)	
Lower middle	34 (30.1%)	79 (69.9%)	35 (31%)	32 (28.3%)	12 (10.6%)	113(100%)	
Poor	1 (20%)	4 (80%)	0 (0%)	3 (60%)	1 (20%)	5(100%)	

TABLE 4 ASSOCIATION OF ANAEMIA WITH IRON FOLIC ACID CONSUMPTION AND ITS DURATION

Maternal characteristics		Normal (n=125)	Any anaemia (n=175)	Severity anaemia			Total (n=300)	p value
				Mild (n=87)	Moderate (n=72)	Severe (n=16)		
Iron folic acid intake	Yes	85 (51.2%)	81 (48.8%)	49 (29.5%)	30 (18.1%)	2 (1.2%)	166(100%)	<0.001
	No	40 (29.9%)	94 (70.1%)	38 (28.4%)	42 (31.3%)	14(10.4%)	134(100%)	
Duration of iron folic acid intake	<1 month	25 (46.3%)	29 (53.7%)	14 (25.9%)	13 (24.1%)	2 (3.7%)	54(100%)	<0.001
	1-3 month	50 (51.5%)	47 (48.5%)	31 (32%)	16 (16.5%)	0 (0%)	97(100%)	
	>3 month	10(66.7%)	5 (33.3%)	4 (26.7%)	1 (6.6%)	0(0%)	15(100%)	