A Study of Anaemia in Pregnancy and Associated Factors at Rural Area

Mukund Bhise

Associate Professor, Department of Preventive and Social Medicine, MIMSR Medical College, Latur, Maharashtra, INDIA.

*Corresponding Address:

mdb_1974@rediffmail.com

Original Article

Abstract: **Background:** Nutritional anaemia is a world-wide problem with the highest prevalence in developing countries. It's also one of the most commonly encountered medical disorders during pregnancy contributing significantly to high maternal mortality. Those most at risk are women from low socio-economic groups and teenagers. **Aim and Objectives:** To study the prevalence of anaemia and the various sociodemographic factors associated with anaemia among pregnant women at rural health center. **Material and Methods:** The present cross-sectional study was carried out at Rural Health Center (RHC) attached to Government Medical College. The study was carried out from August 2014 to July 2016. A total 440 pregnant women visiting the health center for the first time were included in the study. **Results and Observations:** The majority of the subjects were between ages 20 to 29 years with an average age of 22.3 years. The overall prevalence of anaemia among pregnant women was found to be 82.27%. Prevalence of moderate anaemia was high in comparison to the other degrees of anaemia. The lower socioeconomic status is associated with the increase in the risk of development of anemia in pregnancy. **Summary and Conclusions:** Unfavourable sociodemographic factors are the major barriers to the efforts in place for the prevention of anaemia during pregnancy. Low socioeconomic class and illiteracy were significantly associated with high prevalence of anemia during pregnancy in Indian women. *Key Words*: Nutritional anaemia, Haemoglobin.

Introduction

Nutritional anaemia is a world-wide problem with the highest prevalence in developing countries. It is found especially among women of child-bearing age, young children and during the pregnancy and lactation. It is estimated to affect nearly two-thirds of pregnant and one-half of non-pregnant women in developing countries. Increased requirement of iron during growth and pregnancy and chronic blood loss contribute to higher prevalence in specific groups.[1] Anemia is one of the most commonly encountered medical disorders during pregnancy. In developing countries it is a cause of serious concern as, besides many other adverse effects on the mother and the foetus it contributes significantly high maternal mortality.[2] The most common cause of anemia in pregnancy is lack of iron. Less often, it is caused by folic acid deficiency. In some populations, 80% of pregnant women are anaemic. Those most at risk are women from low socio-economic groups and teenagers.[3] WHO has estimated that prevalence of anemia in developed and developing countries in pregnant women is 14 per cent in developed and 51 per cent in developing countries and 65-75 percent in India. Prevalence of anemia in all the groups is higher in India as compared to other developing countries.[4] A knowledge of the sociodemographic factors associated with anemia will help to formulate multipronged strategies to attack this important public health problem in pregnancy.

Definition

During pregnancy, anaemia is defined as a haemoglobin concentration (Hb) <110 g/L at sea level, which is two standard deviations below the mean Hb expected. Consequent to the physiological haemodilution which is maximal during 20–24 weeks of gestation, the Hb varies with the period of gestation. The Hb increases with high altitudesand in those who smoke. A haematocrit of <33% could also beconsidered for the diagnosis of anaemia in pregnancy. Severe anaemia in pregnancy (Hb< 70 g/L) requires urgent medical treatment and Hb<40 g/L is an emergency carrying a risk of congestive cardiac failure, sepsis and death.[5,6]

Causes of anaemia in pregnancy[7]

1. Nutritional Deficiencies	Iron
	Folic Acid
	Vitamin B_{12}
	Vitamin C, Vitamin A
	Protein
2. Haemolysis and abnormal haemoglobin synthesis	Malaria
	Glucose 6 – phosphate dehydrogenase
	deficiency
	Thalassaemias
	Sickle cell disease
3. Blood loss, and defective iron absorption and metabolism	Helminthiasis, especially hookworm infestation
	Amoebiasis and Giadiasis
	Schistosomiasis
	Abnormal iron metabolism
	Bleeding haemorrhoids
	Antepartum haemorrhage
	Trauma
	High parity
4.Chronic conditions	Malignancies
	Tuberculosis
	Chronic renal disease including urinary tract infection

Sexually transmitted infections including bacterial vaginosis, Human Immune deficiency Virus infection. Chronic rheumatic and rheumatoid disease

Material and Methods

The present cross-sectional study was carried out at Rural Health Center (RHC) attached to Government Medical College to determine the prevalence of anaemia and the association of the various sociodemographic factors with anaemia in pregnant women. The RHC is situated at about 40 km away from the city and provides medical care to the majority of the inhabitants. The total population covered by this center is approximately 35,000 people. The Ante Natal Care (ANC) clinic is conducted weekly on every wednesday. Registration of the pregnant women visiting the ANC is maintained by the health worker separately for the first and the subsequent visit of the pregnant women. The study was carried out from August 2014 to July 2016. A total 440 pregnant women visiting the health center for the first time were included in the study by systematic random sampling technique. The participants with the history of amenorrhea underwent a urine pregnancy test and vaginal examination in doubtful cases to diagnose pregnancy. Pregnant women with multiple pregnancies, history of high-grade fever in the last 3 months, passing worms in the stool, bleeding disorder in the previous pregnancy and taking iron and folic acid tablets before registration were excluded from the study. Informed consent was obtained and explanation as to the purpose of the study was offered. Pregnant women were interviewed with the predesigned, pretested proforma and clinical examination was done. A detailed demographic profile of the women,

that is, age, age at first pregnancy, religion, type of family, family size, educational level of a woman and her husband, occupation of a woman and her husband, was collected. Socioeconomic classification suggested by B.G. Prasad was adopted and updated.[8]A dietary history was taken with the help of 24-hr recall method and also assessed about various food items avoided, especially during pregnancy.[9] Gestational age was assessed from the last menstrual period. For those women who did not remember the last menstrual period date, gestational age was co-related to the local calendar events and assessing fundal height. Regarding the laboratory method, haemoglobin level was estimated by Sahli's acid hematin method of haemoglobin estimation.[10] According to World Health Organization (WHO), haemoglobin level below 11 g/dL is labeled as anemia during pregnancy and classified as mild (10.0–10.99 g/dL), moderate (7.0– 9.9 g/dL), and severe (<7.0 g/dL) anemia. The same criteria were used for diagnosing anemia in pregnancy.[11] Tiredness, weakness, lethargy, irritability and decreased work tolerance are the well known clinical presentations of anaemia.However, the majority of women with mild to moderate anaemia are asymptomatic. Rarely, a woman with severe anaemia may present with glossitis, angular stomatitis, ankle oedema and early evidence of congestive cardiac failure and may require emergency treatment. Multiple pregnancy, teenage pregnancy and high parity are associated with increased risk of anaemia in pregnancy.

Results and Observations

In the present study, the mean duration of married life of pregnant women was 4.2 years. Mean age at menarche was found to be 13.5 years. Mean spacing interval was 1.7 years. Mean height and weight of the study subjects were 152.3 cm and 48.5 kg, respectively. The demographic characteristics of the study subjects are summarized in Table No01.

Table 1: Demographic characteristics of pregnant women (n = 440)

Parameter	Number(n = 440)	Percentages (%)
Age groups (Years)		
<20	115	26.00%
20-24	185	42.00%
25-29	101	23.00%
>/= 30	39	09.00%
Religion		
Hindu	229	52.00%
Muslim	126	29.00%
Buddhist	57	13.00%
Others	28	06.00%
Type of Family		
Nuclear	115	26.00%
Joint	268	61.00%
Three generation	57	13.00%
Socioeconomic class		
Class I	31	07.00%
Class II	66	15.00%
Class III	123	28.00%
Class IV	135	31.00%
Class V	85	19.00%
Total	**440**	**100.00%**

The majority of the subjects were between ages 20 to 29 years with an average age of 22.3 years. About 2%of all the pregnancies occurred among teenagers and 9% were among women aged 30 years and above. It was observed that the maximum number of the study subjects 229 (52.00%) were Hindus. The study subjects who belonged to joint family were 268 (61.00%) followed by nuclear family were 115 (26.00%). The maximum numbers of women were from social classes IV and III (31.00% and 28.00%) respectively.
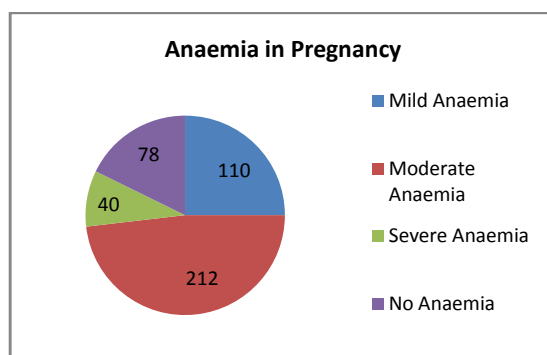
Figure 1: Distribution of anaemia among pregnant women

As shown in Figure No 01, the overall prevalence of anaemia among pregnant women was found to be 82.27%. The prevalence of mild, moderate and severe anaemia were observed as 30.38%, 58.59% and 11.03% respectively. Thus the prevalence of moderate anaemia was high in comparison to the other degrees of anaemia. From table no 02, a maximum number of anaemia cases belonged to age group 20- 24 years i. e. 46.40% also, regarding socioeconomic status major proportion of anaemia cases were of the class IV (37.30%) followed by class III (30.93%). Thus, lower socioeconomic status is associated with the increase in the risk of development of anemia in pregnancy. This association between the socioeconomic status of the family and anemia in pregnancy was found to be statistically significant ($P < 0.05$).

Table 2: Distribution of anaemia in pregnant women according to their age, socioeconomic class and their educational status (n = 440)

Various Parameters	Anaemia			
	Mild	**Moderate**	**Severe**	**Total**
Age in years				
<20	24	48	10	82 (22.65%)
20-24	41	112	15	168 (46.40%)
25-29	32	45	08	85 (23.50%)
>/= 30	13	07	07	27 (7.45%)
Total	110	212	40	362 (100.00%)
Socioeconomic Status				
Class I	07	03	01	11 (03.03%)
Class II	12	23	07	42 (11.60%)
Class III	41	62	09	112 (30.93%)
Class IV	36	87	12	135 (37.30%)
Class V	14	37	11	62 (17.14%)
Total	110	212	40	362 (100.00%)
Educational status				
Illiterate	24	50	08	82 (22.65%)
Primary school	18	53	05	76 (20.99%)
Secondary school	36	82	19	137 (37.85%)
High school	15	21	05	41 (11.33%)
Graduate	13	05	02	20 (05.53%)
Post graduate	04	01	01	06 (01.65%)
Total	**110**	**212**	**40**	**362 (100.00%)**
Percentages (%)	**30.38%**	**58.59%**	**11.03%**	**82.27% (% of n)**

Its also found that the lower the educational level of the women, the higher the probability of suffering from anaemia during pregnancy. From Illiterate women, those educated up to primary and secondary school levels were more prone to be anaemic than graduates and postgraduates. This association between the educational status of the husbands and anemia in the pregnant women was found to be significant statistically (P < 0.05).

Discussion

From the present study, the prevalence of anaemia during pregnancy was found to be 82.27%.A study carried out among 7 states by Nutrition Foundation of India had observed the overall prevalence of anaemia as 84% among pregnant women similar to the present study.[13]"Indian Council of Medical Research (ICMR) Task Force Multicenter Study" revealed that the overall prevalence of anaemia among pregnant women from 16 districts was 84.9% (range 61.0% –96.8%).[14] With regard to the developed countries, the socioeconomic developments, higher standard of living, better utilization of health care facilities along with increasing literacy rate are associated with the low prevalence of anaemia. In these countries, the prevalence of anaemia was only 18% among pregnant women as reported by WHO (1998).[15] The religion itself may not be the cause for higher prevalence of anaemia in any of the community, but it may work through different dietary patterns, food taboos, and so on. For example, In India, pregnant Hindu women are advised to avoid non vegetarian diet during pregnancy

as it generates heat. Lower socioeconomic status was associated with a higher prevalence of anemia in pregnancy. A cross-sectional study in New Delhi had revealed that there was a trend of decreasing severity of anemia with higher per capita income as found in the present study.[16]Similar results to our present study i.e. one study found that anaemia was most common in illiterate women (53.7%) as compared with 37.1% in literate women.[17] From the National Family Health Survey (NFHS) -2 it was conclusively found that, the educational status of the husbands and the women are equally important factors as it makes the couple receptive to the advice given by the health staff. In order to prevent nutritional anaemia among mothers and children (1-12 years), the Government of India sponsored a National Nutritional Anaemia Prophylaxis Program during the fourth 5 year plan. The program is based on daily supplementation with iron and folic acid tablets to prevent mild and moderate cases of anaemia. The beneficiaries are "at risk" group's viz., pregnant women, lactating mothers and children under 12 years. [14] These are determined by the Hb levels of the patients. If the Hb is between 10 and 12, daily supplement with iron and folic acid tablets is advised; if it is <10 g, the patient is referred to the nearest primary health center.[18]

Summary and Conclusions

There is a very high prevalence of anaemia during pregnancy found to be 82.27% among the study participants. The prevalence of moderate anaemia was

high in comparison to the other degrees of anaemia. Unfavourable sociodemographic factors are the major barriers to the efforts in place for the prevention of anaemia during pregnancy. About the socioeconomic developments, higher standard of living, better utilization of health care facilities along with increasing literacy rate are associated with the low prevalence of anaemia. The religion itself may not be the cause for higher prevalence of anaemia.

References

1. The Work of World Health Organization from 1980-81, Biennia Report number 31.
2. Sharma JB, Shankar M (Oct-Dec 2010) 'Anemia in Pregnancy', JIMSA, 23(4), pp. 253-60.
3. Shaikh Sabina *et al*.; An Overview of Anemia in Pregnancy; Journal of Innovations in Pharmaceuticals and Biological Sciences; 2015: Vol 2 (2), 144-151.
4. Kalaivani K, 'Prevalence and consequences of anemia in pregnancy', Indian J Med Res 130, November 2009, pp 627-633.
5. World Health Organization. Iron deficiency anaemia assessment prevention and control: a guide for programme managers. Geneva: World Health Organization, 2001. 132 (WHO/ NHD/01.3).
6. Vitamin and Mineral Nutrition Information System. Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. Geneva: World Health Organization, 2011 (WHO/ NMH/NHD/MNM/11.1).
7. Goonewardene M *et al*.; Anaemia in pregnancy; Best Practice and Research Clinical Obstetrics and Gynaecology 26 (2012) 3–24.
8. Baride JP, Kulakrni AP. Text book of community medicine. 3rd ed. Mumbai, India: Vora Medical Publications; 2006. p. 12-35.
9. Jelilifee DB, The assessment of the nutritional status of the community. Geneva: World Health Organization; 1966. p. 132.
10. Sanyal S. Clinical Pathology: Prep manual for undergraduates. New Delhi: Elsevier India Private limited; 2005. p. 25.
11. Toteja GS, Singh P. Micronutrient profile of Indian population. New Delhi: Indian Council of Medical Research; 2004.
12. Luke B. Nutrition and multiple gestations. SeminPerinatol 2005; 29(5): 349–354.
13. Agarwal KN, Agarwal DK. Prevalence of anaemia in pregnant and lactating women in India. Indian J Med Res 2006; 124:173-84.
14. Toteja GS, Singh P, Dhillon BS, Saxena BN. Micronutrient deficiency disorders in 16 districts of India –Part 1 Report of ICMR task force study. District Nutrition Project. Ansari nagar, New Delhi: Indian Council of Medical Research; 2001.
15. World Health Organization. The prevalence of anaemia in women: A tabulation of available information. 2nd ed. Geneva: WHO; 1992.
16. Gautam VP, Bansal Y, Taneja DK, Renuka S. Prevalence of anaemia amongst pregnant women and its socio-demographic associates in rural area of Delhi. Indian J Community Med 2002; 27:157-60.
17. Desalegn S. Prevalence of anaemia in pregnancy in Jima town, southwestern Ethiopia. Ethiop Med J 1993; 31:251-8. Govt. of India. Manual for Health Worker (F). Vol I. New Delhi: Ministry of Health and Family Welfare; 1978.