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Research Article

Prevalence and factors associated with anaemia among pregnant women in rural Mysore, Karnataka, India

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ABSTRACT

Background: Under nutrition of pregnant women has been an important aspect of maternal health. Anemia is one of the important conditions which have to be screened among them. If not treated, it can lead to maternal and foetal complications sometimes ending in death. Anemia can also indicate the operational efficiency of Maternal and Child Health facilities in the community. Objective of the study was to assess the prevalence and factors associated with anemia among pregnant women in rural field practice area of a private Medical College.
Methods: This cross sectional community based study was conducted in Hadinaru primary health centre (PHC), of Mysore district for a period of 6 months (June to November 2011). Pregnant women who delivered between Janauary to December 2010 and were permanent residents of the villages under Hadinaru PHC were included in the study. These mothers were visited at their home and information was collected using pre-structured questionnaire. Lab reports and antenatal check-up details were referred wherever available.
Results: 314 mothers were covered in the study out of which 196 were anemic (62.4%). Mild anemia was seen in 52.0% women and 11.0% had moderate anemia. Weight gain during pregnancy and menstrual problems of mothers were significantly associated with anemia during pregnancy.
Conclusions: The prevalence of anaemia among pregnant women was found to be 62.4%. Even though there were no cases of severe anaemia, mild and moderate degree anemics were in significant number.

Keywords: Anemia, Pregnant women, Mysore, India

INTRODUCTION

Undernutrition has been a glaring problem of India, especially among the vulnerable groups like children and women population. Child nutrition gets its due attention because of associated frank morbidity and mortality. But adolescent women and pregnant women rarely get noticed because of their adaptability and Indian nature of 'learn to live with it' till the problem exacerbates and complications set in. Around 2010 it was reported that 48% of Indian underfives suffered from undernutrition. During the same period, 70% of adolescent girls suffered from undernutrion.[1] This continues in their married life as early marriage of girls is a norm in India. After marriage women rarely get an opportunity to care about themselves while working for the family. During the pregnancy they may get attention if living in a joint family, but nowadays the trend of nuclear families and working women is on the rise.

This is having an impact on the nutrition of the pregnant women. Most common form of nutritional problem seen among these women is anemia. Though national programs have been trying to control anemia, its vicious nature of occurrence due to infections, sociocultural factors, availability of health services, menstrual problems and questionable compliance to iron supplementation treatment, it has remained as a major problem during pregnancy. As reported by various studies, the burden of anemia in Indian pregnant women

ranges from 33 to 89%.[2-6] The complications related to anemia during pregnancy like intra uterine growth retardation, low birth weight, perinatal mortality, maternal mortality have left huge socioeconomic as well as emotional impact on many Indian families. It also results in inadequate iron stores for the newborn, increased risk of maternal morbidity and mortality, and lowered physical activity, mental concentration, and productivity.[7] Iron deposits in pregnant women specially during the third trimester is more important as it determines the occurrence of intrauterine and intrapartal complications along with growth of the foetus and its perinatal outcome[8].

In India, 16% maternal deaths are attributed to anemia. The association between anemia and adverse pregnancy outcome, higher incidence of preterm and low birth weight deliveries has been demonstrated.[9] Women with even mild anemia may experience fatigue and have reduced work capacity. National nutritional anemia prophylaxis program, started in 1970 has been trying to control this avoidable cause of important public health problem of India by supplementing iron and Folic acid tablets. Program insists on consumption of minimum 100 IFA tablets.

With this background of anemia in our country this study has been conducted to assess the prevalence of anemia among pregnant women and its associated risk factors in rural field practice area of a private Medical College in southern India.

METHODS

It was a cross sectional community based study which was conducted at Hadinaru Primary Health Centrearea (field practice area of a private College), of Mysore district, Karnataka, India from June to November 2011 six months.

Study population

All the pregnant women who delivered during the period between Janauary to December 2010 and permanent residents of the villages under Hadinaru PHC

Totally 314 mothers were interviewed from 16 villages covering over 27000 population.

Data collection

All eligible study subjects were visited at their home and information was collected using pre-structured questionnaire including the details of general information, details of socioeconomic determinants, age at marriage and details of health events and treatment during pregnancy. Lab reports and antenatal check-up details were referred for the haemoglobin reading. Third trimester haemoglobin level of the mother was noted down. WHO cut off levels for classifying anemia were used. Accordingly haemoglobin of less than 11.00gm/dl was classified as anemia. Mild anemia range was 10.00 to 10.99 gm/dl, moderate 7.00 to 9.99gm/dl and severe if haemoglobin was less than 7.00 gm/dl.[10]

Data analysis

Data collected was cross checked for completeness and entered into Excel software. Trial version of SPSS software was used for statistical analysis. Univariate analysis like proportion, percentages, mean, standard deviation, confidence intervals was calculated.

Bivariate analysis was done using cross tabulations and tests of significance like chi square test. Difference of distribution of the variables was studied at 5% alpha error. Ethical approval was taken from Institutional ethical committee of JSS Medical College. Informed written consent was taken from all the participants before starting the study.

RESULTS

From house to house survey 314 mothers were interviewed in the study. All mothers satisfying the inclusion criteria were visited and included in the study. 84.4% of the mothers were literates with proper schooling but 97% of them were limited to household work. All mothers were from Hindu religion with nearly 15 % from scheduled caste or tribe and another 60% from backward communities.

Table 1: Socio-demographic attributes of the study subjects.

Variable	Frequency	Percentage
Mother's education		
illiterate	49	15.6
1 to 4	22	7
5 to 7	76	24.2
8 to 12	156	49.7
Degree/diploma	11	3.5
Mother's occupation		
Labour	4	1.3
Private par timejob	4	1.3
Govt job	2	0.6
housewife	304	96.8
Type of family		
Nuclear	70	22.3
Joint	157	50
Three generation	87	27.7
Age at marriage		
<18 years	112	35.7
18 to 25	199	63.3
>25 years	3	1

Half of the study mothers were living in joint families. Child marriage was a still a problem with 35.7% of the

marriages having happened before 18 years of age and half the mothers conceiving before their 20th birthday. Weight gain during pregnancy was assessed from the time of preconception or registration of pregnancy till delivery. Most mothers had put on more than five kilos. 35% of the mothers were exposed to passive smoking mostly from the father in law or husband.

Table 2: Antenatal care details of the study subjects.

Variable	Frequency	Percentage
Age at 1st conception		
Less than 20	155	49.4
20 to 25 years	140	44.6
26 to 30	17	5.4
>30	2	0.6
Height of mother		
<145cm	76	24.2
145 to 155	161	51.3
>155	77	24.5
Weight gain during pregnancy		
3 to 5	1	0.3
5.1 to 9	175	55.7
9.1 to 13	114	36.3
>13	24	7.6
Time at registration of pregnancy		
First trimester	267	85
2nd trimester	47	15
Number of ANC check-ups		
<3	4	1.3
3	14	4.5
4 to 6	86	27.4
>6	210	66.9
Number of IFA tablets consumed		
Zero	1	0.3
31-60	8	2.5
61 to 100	14	4.5
>100	291	92.7
Duration of supplementary food taken		
Nil	96	30.6
<2 months	117	37.3
2 to 4 months	72	22.9
>4 months	29	9.2

Antenatal care practices were adequate as all mothers had registered their pregnancy in government primary health centres with nearly 85% registering within three months. Almost all mothers had undergone three or more ANC check-ups, 92% had consumed more than 100 IFA tablets.

As seen in Figure 1, anemia was seen among 62% of the mothers during their 3rd trimester. Severe anemia was seen in 10% of the mothers but remaining was suffering from mild to moderate anemia. Five percent deliveries had happened at home and two thirds at District hospital. 90% of all the deliveries were conducted by doctors. Three % were preterm deliveries and 19% were low birth weight babies.

As seen in Table 3, in bivariate analysis it was noticed that, mothers were found to be at higher risk of suffering from anemia with early age at marriage, lower educational level, mothers living in nuclear families, lower socio economic status (SES), history of menstrual problems in the form of excessive bleeding or irregular cycles, mothers who have had less than three ANC check-ups, consumed less than 100 IFA tablets, gained less than nine kilo weight during pregnancy and multiparity.

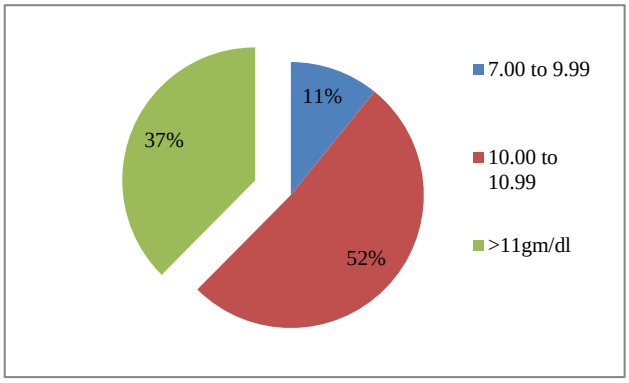

Figure 1: Distribution of study subjects according to their hemoglobin level.

Among the anemic mothers the chances of premature delivery, intrapartal complications and low birth weight of the baby were noticed at a higher rate than the non-anemic mothers. However the difference found was not statistically significant except for mothers with menstrual problems, less weight gain during the pregnancy.

DISCUSSION

With lot of efforts being put by the Indian government to improve the health status of its vulnerable populations we can now hope for the change. Though the change is at a slow pace definitely there is improvement as shown by various studies over the years from different parts of the country. Present study observed a prevalence of 62% anemia among the pregnant women. Another hospital based study from the same region reported that more than 50% of the mothers were anemic at some time during their pregnancy and 39% of the mothers were anemic throughout.[8]

Lower prevalence of anemia in this study could be because, it was conducted at a super speciality tertiary care hospital attracting mostly affordable, higher socioeconomic status mothers mainly from urban areas. ICMR study conducted in 16 districts of India during late 1990s reported 85% anemia during pregnancy.[11] Study conducted by Lokare[5] et al around the period of 2006-08 reported 87.2% prevalence.

Another study by Bentley analysing the data of NFHS-2 reported 50% anemia among the mothers of Andhra Pradesh which is neighbouring state of the present study area.[4] Thus present study results are consistent with the high prevalence of anemia among pregnant mothers and it also emphasises on the decreasing prevalence. Comparatively less prevalence of NFHS-2 might be because of its large population coverage compared to the present study.

Table 3: Distribution of various risk factors and outcomes of anemia during pregnancy among study subjects.

Variable	Category	Anemic	Non anemic	p value
Mother's Education	Up to 7th std	99 (67.3%)	48 (32.6%)	0.05
	High school & above	97 (58.1%)	70 (41.1%)	
Maternal age at marriage (years)	<18	64 (57.1%)	48 (42.9%)	0.09
	≥18	132 (65.3%)	70 (34.7%)	
Maternal age at1st conception(years)	< 20	91 (58.7%)	64 (41.3%)	0.11
	≥20	105 (66.0%)	54 (34.0%)	
Type of family	Nuclear	47 (67.1%)	23 (32.9)	0.09
	Joint / three gen	149 (61.1%)	95 (38.9%)	
SES	BPL	157 (64.6%)	86 (35.4%)	0.13
Mother's height	<145 cm	52 (68.4%)	24 (31.6%)	0.13
	≥145cm	144 (60.5%)	94 (39.5%)	
Weight gain during pregnancy	Upto 9 kg	119 (67.6%)	57 (32.4%)	0.03
	>9kg	77(55.8%)	61 (44.2%)	
Menstrual problems	Present	8 (72.7%)	3 (27.3%)	0.014(F test)
	Absent	193	110	
ANC check ups	<3	10 (55.6%)	8 (44.4%)	0.53
	3 and above	193 (62.3)	117 (37.7%)	
IFA tablets consumed	<100	17 (74%)	6 (26%)	0.23
	≥100	179 (61.5%)	112 (38.5%)	
Parity	Primi	96 (60.0%)	64 (40.0%)	0.36
	>1	100 (65%)	54 (35%)	
Birth weight	<2.5kg	43 (70.5%)	18 (29.5%)	0.14
	>2.5Kg	153 (60.5%)	100 (39.5%)	
Intra partal complications	Present	14 (61%)	9 (39%)	0.87
	Absent	182 (62.5%)	109 (37.5%)	
Premature birth	Yes	7 (77.8%)	2 (22.2%)	0.9
	No	189 (62.0%)	116 (38.0%)	

Present study noticed that there were no cases of severe anemia among the study subjects. There were only 11% cases of moderate anemia and majority were mild anemics. This trend is again consistent with the decreasing burden of nutritional anemia. As reported by nationwide study of ICMR, the overall prevalence of moderate and mild anemia in pregnant women was 60.1% and 11.8%, respectively.[11]

According to NFHS-2 data from Andhra Pradesh 32.4% were mildly anemic, 14.9% moderately anemic, and 2.2% were severely anemic in late 1990s.[4] Above studies support the findings of present study. As reported by Lokare et al the prevalence of mild, moderate, severe anemia were observed as 24.7%, 54.5%, and 7.9%, respectively.[5] The difference in observation of higher proportion of moderate anemia cases could be because of the urban slum setting of their study.

Increasing awareness regarding the availability and need for utilization of the antenatal care services has had its impact in the form of reduced cases of severe and moderate anemia. In the present study this finding is also supported by 85% literacy of the mothers. In addition to this, two thirds of mother's educated less than 8th standard had suffered from anemia, which strengthens the role of education or awareness on nutritional status. Nearly 36% of the mothers had got married before the age of 18 years and more than half of these mothers had suffered from anemia. 49% of the mothers had conceived before the age of 20 years and as expected there was 19% more occurrence of anemia among these mothers.

Nearly two thirds of the mothers in nuclear families and lower SES families had anemia. Similar results were reported by NFHS-2 from Andhra Pradesh where they observed higher burden of anemia among poor SES. The prevalence of anemia was high among all groups. Prevalence of mild, moderate and severe anemia was higher among the lower standards of living of both rural and urban areas compared to higher standards of living.[4] Study from Aurangabad district of Maharashtra (Central part of India) also reported statistically significant higher prevalence of anemia among lower SES mother.[5]

Present study observed higher prevalence of anemia among mothers with history of menstrual problems in their preconceptional reproductive life. Most common complaints were excessive bleeding and irregular cycles, this could be because of increased blood loss and depletion of body stores of iron which would be further exaggerated by nutritionally demanding state of pregnancy unless supplied with sufficient nutritional supplementation. This is supported by our study finding of three times higher mothers in anemic category than non-anemic in those consuming less than 100 IFA tablets.

Surrogate marker of nutrition during pregnancy is weight gain, in the present study it was observed that mothers who had gained weight less than nine kilos had significantly higher chances of suffering from anemia. In India on an average weight gain for a full term pregnancy, mother gains around seven kilos.[14]

Short statures of mothers, which is a proxy indicator of long standing nutritional insufficiency is associated with many complications. In the present study, anemia was seen more among these short statured mothers emphasising their undernourishment being continued in pregnancy also. A comparative analysis of Indian and African mothers reported that 42% of Indian prepregnant women are underweight.[14]

Two to three time higher chances of low birth weight of the baby, intrapartal complications and premature deliveries were observed in the present study among the anemic mothers. A tertiary care hospital based study in Mysore found that there was 6.5% increase in the incidence of low birth weight babies and 11.5% increase in preterm deliveries in mothers who were anemic in their third trimester.[8]

Another hospital based comparative observational study from Rawalpindi, Pakistan reported the number of low birth weight infants (64%) was statistically more in the anaemic group of mothers than the non anaemic group (10%).[12] The risk of preterm delivery and LBW was 4 and 1.9 times higher among anaemic women, respectively. Newborns of anaemic mothers had 1.8 times increased risk of having an APGAR score of less than five at one minute and the risk of intra uterine death was 3.7 times higher for anaemic women[13]. This emphasises the importance of adequate hemoglobin in the third trimester.

CONCLUSION

The prevalence of anaemia among pregnant women was found to be 62.4%. Even though there were no cases of severe anaemia, mild (52%) and moderate (11%) degree anemics were still a challenge.

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