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Research Article

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A study on magnitude of anaemia and its socio-demographic correlates among pregnant women in Sagar city of Bundelkhand Region, Madhya Pradesh, India

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ABSTRACT

Background: India is one of the countries with very high prevalence of anaemia in the world. Almost 58% of pregnant women in India are anaemic and it is estimated that anaemia is the underlying cause for 20-40% of maternal deaths in India. India contributes to about 80% of the maternal death due to anaemia in South Asia. First Anaemia reduces women's energy and capacity for work and can therefore threatened household food security and income. Second, severe anaemia in pregnancy impairs oxygen delivery to foetus and interferes with normal intrauterine growth, resulting in intrauterine growth retardation, still birth, LBW and neonatal deaths. Therefore anaemia is a major contributor to poor pregnancy and birth outcomes in developing countries as it predisposes to premature delivery, increased perinatal mortality and increased risk of death during delivery and postpartum.

Keeping this view in mind the study was carried out with the objectives to assess the magnitude and risk factors for anaemia among urban pregnant woman in Sagar City, Madhya Pradesh, India.

Methods: A cross sectional study was conducted at the urban health training centre Chameli chauk, Sagar, MP,India from 1stJanuary to 30th September 2014. A total 150 pregnant women were studied.

Results: Overall prevalence of anaemia among pregnant women was found to be 74.7% of which maximum 44.7% were suffering from mild anaemia and 22.7% had moderate degree of aneamia whereas only 11 (7.3%) were severely anaemic. Religion, caste, educational attainment, socioeconomic status and parity come out to be important predictors of anaemia in pregnancy (P<0.05).

Conclusions: In the present study prevalence of anaemia in pregnant women was found to be high specially among Hindus, Schedule caste, illiterates, low income group and Multiparous women, indicating very poor maternal and child health care in the region. So there is a need to intensify IEC activities to promote early antenatal check-up, dietary modification and utilization of family planning services in the region.

Keywords: Anaemia, Pregnancy, Haemoglobin, ANC

INTRODUCTION

India is one of the countries with very high prevalence of anaemia in the world. Almost 58% of pregnant women in India are anaemic and it is estimated that anaemia is the underlying cause for 20-40% of maternal deaths in India.

India contributes to about 80% of the maternal death due to anaemia in South Asia.¹

According to National Nutrition Monitoring Bureau, 83.8% pregnant women were suffering from anaemia in Madhya Pradesh, of which 16.8%, 59.4% and 7.6%

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women had mild, moderate and severe degree of anaemia respectively.²

The consequences of anaemia in women are enormous as the condition adversely affects both their productive and reproductive capabilities. First Anaemia reduces women's energy and capacity for work and can therefore threatened household food security and income. Second, severe anaemia in pregnancy impairs oxygen delivery to foetus and interferes with normal intrauterine growth, resulting in intrauterine growth retardation, still birth, LBW and neonatal deaths. Therefore anaemia is a major contributor to poor pregnancy and birth outcomes in developing countries as it predisposes to premature delivery, increased perinatal mortality and increased risk of death during delivery and postpartum. ¹

Keeping this view in mind this study was a small attempt to know the magnitude of anaemia and its associated risk factors among urban pregnant females in Sagar City of Madhya Pradesh, India.

METHODS

The present cross sectional study was conducted among pregnant women attending ANC clinic at Urban health and training centre Chameli chauk, Sagar, MP, India from 1st January to 30th September 2014. A total 150 pregnant women were studied.

The sample size was calculated by using general formula (N=4PQ/L2) for determination of sample size for estimating proportions. According to this formula with 58% prevalence rate at 95% confidence level and 15% allowable error, we obtained a sample of 128. However, this minimum sample size was increased to 150 pregnant women to improve the precision of the study.

Inclusion criteria

All pregnant women visiting ANC clinic for the first time, during the study period were included consecutively.

Exclusion criteria

Pregnant women who were severely ill, not willing to participate in the study and taking prophylactic/therapeutic dose of Iron and folic acid were excluded from the study.

A predesigned and pre-tested proforma was used for data collection. Informed consent of the study subjects was obtained before interview. Sahali's method was used for Hb estimation. All sorts of care were taken throughout the study to avoid repetition of the study subjects. WHO's classification was used for identifying different grades of anaemia among pregnant women. Data were analyzed by using Graph Pad InStat-3 software. The Chi-

squire test was applied for statistical analysis. P <0.5 was considered as statistically significant.

RESULTS

Out of 150 studied pregnant women, 112 (74.7%) were anaemic while 38 (25.3%) were non- aneamic. Among 112 anaemic women, maximum 67 (44.7%) were mildly anaemic whereas 34 (22.7%) had moderate degree of anaemic and only 11 (7.3%) were severely anaemic as seen in Figure 1.

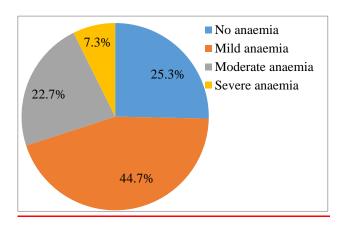


Figure 1: Distribution of pregnant women according to grades of anaemia.

In the present study, out of total 150 pregnant women, majority 94 (62.7%) were in 20-30 years age group followed by 37 (24.6%) above 30 years age group while only 19 (12.7%) were below 20 years of age which indicate adolescent pregnancy. The prevalence of anaemia was almost equal about (75.5%) in 20-30 years and above 30 years age group. There was no significant association (p=0.798) (Table 1).

Table 1: Age wise distribution of anaemia among pregnant women.

Age group (years)	Anaemia present	Anaemia absent	Total
<20	13 (68.4%)	6 (31.6%)	19 (12.7%)
20-30	71 (75.5%)	23 (24.5%)	94 (62.7%)
>30	28 (75.7%)	9 (24.3%)	37 (24.6%)
Total	112 (74.7%)	38 (25.3%)	150(100%)

 χ^2 =0.448,df=2, p=0.798

Majority of the women studied 116 (77.3%) were Hindus of them 93 (80.2%) were suffering from anaemia. While amongst 31 (20.7%) Muslims women studied, 18 (58.1%) were anaemic. The association of anaemia with religion was found to be significant (p=0.0106) Table 2.

Out of 150 studied pregnant women who attended ANC clinic at the hospital, the majority of women belonged to General Category 62 (41.3%) followed by Scheduled Castes 53 (35.3%) and OBC 31 (20.7%) and only few to

Scheduled Tribes 4 (2.7%). We observed that anaemia was more common in Scheduled Castes (88.7%) as compared to women of other castes. The difference was statistically significant (p=0.0093) Table 3.

Table 2: Religion wise distribution of anaemia among pregnant women.

Religion	Anaemia present	Anaemia absent	Total
Hindu	93 (80.2%)	23 (19.8%)	116 (77.3%)
Muslim	18 (58.1%)	13 (41.9%)	31 (20.7%)
Jain	1 (33.3%)	2 (66.7%)	3 (2%)
Total	112 (74.7%)	38 (25.3%)	150 (100%)

 $[\]chi^2$ =9.0857, df=2, p=0.0106

Table 3: Caste wise distribution of anaemia among pregnant women.

Caste	Anaemia present	Anaemia absent	Total
General	38 (61.3%)	24 (38.7%)	62 (41.3%)
OBC	24 (77.4%)	7 (22.6%)	31 (20.7%)
SC	47 (88.7%)	6 (11.3%)	53 (35.3%)
ST	3 (75%)	1 (25%)	4 (2.7%)
Total	112 (74.7%)	38 (25.3%)	150 (100%)

 $[\]chi^2$ =11.490, df=3, p=0.0093

Study revealed that majority of women (27.3%) were educated up to middle school While only (5.3%) women did graduation and above and 18.7% were illiterate. whereas proportions of pregnant women suffering from anaemia were 89.3 %, 82.4% and 80.5% among illiterates, those educated up to primary and middle school respectively. The association of anaemia with educational status was found to be statistically highly significant (p=0.0074) as shown in Table 4.

Table 4: Education wise distribution of anaemia among pregnant women.

Educational status	Anaemia present	Anaemia absent	Total
Illiterate	25 (89.3%)	3 (10.7%)	28(18.7%)
Primary School	28 (82.4%)	6 (17.6%)	34 (22.7%)
Middle School	33 (80.5%)	8 (19.5%)	41 (27.3%)
High School	14 (63.6%)	8 (36.4%)	22(14.7%)
Higher Secondary	8 (47.1%)	9 (52.9%)	17 (11.3%)
Graduate and above	4 (50%)	4 (50%)	8 (5.3%)
Total	112 (74.7%)	38(25.3%)	150 (100%)

 $[\]chi^2$ =15.798, df=5, p=0.0074

Most of the studied women were house wife 124 (82.7%) of them 95 (76.6%) were suffering from anaemia.

However, the difference was not statistically significant (Table 5).

Table 5: Occupation wise distribution of anaemia among pregnant women.

Occupation	Anaemia present	Anaemia absent	Total
Housewife	95 (76.6%)	29 (23.4%)	124 (82.7%)
Labourer / Daily wager	9 (81.8%)	2 (18.2%)	11 (7.3%)
Service	5 (62.5%)	3 (37.5%)	8 (5.3%)
Others	3 (42.9%)	4 (57.1%)	7 (4.7%)
Total	112 (74.7%)	38 (25.3%)	150 (100%)

 χ^2 =4.9162, df=3, p=0.1780

Majority of women belonged to poor socioeconomic classes V (39.3%) and IV (31.3%) while only 8% women were from higher income groups (Classes- I and II). The maximum prevalence of anaemia was observed in class-V (88.1%) while minimum in class-I (33.3%) and it is also evident from the study that as the socio-economic status decreased, the prevalence of anaemia increased. The association of anaemia with socioeconomic classes was found to be statistically highly significant (p=0.0066) (Table 6).

Table 6: Socioeconomic class wise distribution of anaemia in pregnant women.

Socio- economic class (Modified Prasad's classification)	Anaemia present	Anaemia absent	Total
Class-I	1 (33.3%)	2 (66.7%)	3 (2%)
Class-II	4 (44.4%)	5 (55.6%)	9 (6%)
Class-III	21 (65.6%)	11 (34.4%)	32 (21.3%)
Class-IV	34 (72.3%)	13 (27.7%)	47(31.3%)
Class-V	52 (88.1%)	7 (11.9%)	59 (39.3%)
Total	112(74.7%)	38(25.3%)	150(100%)

 χ^2 =14.231, df=4, p=0.0066

In the current study, 42.7% women were in their second trimester of pregnancy while rests were in third (32.6%) and first trimester (24.7%). The anaemia was also more prevalent in second trimester (73.4%) as compared to first (64.9%) and third (63.3%) trimester. But the difference was not found to be statistically significant (Table 7).

Out of a total 150, (44.7%) women were primiparous, (28.0%) nulliparous and (27.3%) were multiparous. The prevalence of anaemia was also higher (90.2%) among multiparous women than (71.6%) and (64.28%) in Primiparous and nulliparous women respectively. So it was obvious that as the parity increased, the prevalence of anaemia also increased. The association of anaemia with parity was found to be statistically significant (p=0.0185) (Table 8).

Table 7: Gestational age wise distribution of anaemia in pregnant women.

Gestational age	Anaemia present	Anaemia absent	Total
First trimester	24 (64.9%)	13 (35.1%)	37 (24.7%)
Second trimester	47 (73.4%)	17 (26.6%)	64 (42.7%)
Third trimester	31 (63.3%)	18 (36.7%)	49 (32.6%)
Total	112 (74.7%)	38 (25.3%)	150 (100%)

 $[\]chi^2$ =1.541, df=2, p=0.4627

Table 8: Parity wise distribution of anaemia in pregnant women.

Parity	Anaemia present	Anaemia absent	Total
Nulliparous	27 (64.28%)	15 (35.7%)	42 (28.0%)
Primiparous	48 (71.6%)	19 (28.4%)	67 (44.7%)
Multiparous	37 (90.2%)	4 (9.8%)	41 (27.3%)
Total	112 (74.7%)	38 (25.3%)	150(100%)

 $[\]chi^2$ =7.9763, df=2, p=0.0185

DISCUSSION

In the present study overall prevalence of anaemia among pregnant women was found to be (74.7%) which was higher than the national average (58%), indicating very poor maternal and child health care in the region. Ahmad N et al (2010) reported almost similar prevalence rate (74.84%) in their study in Maharashtra. However, other authors reported higher prevalence rate in their studies, Gautam VP et al (96.5%), Lokare PO et al (87.2%), and Ray Sk et al (86.39%). And This may be due to difference in sample size and geographical location.

While low prevalence was noted by Vijay M et al (43.01%) in gandarbal block of Jammu and Kashmir and (27.9%) by kefiyalew F et al in south east Ethiopia.^{7,8} This might be due to a difference in socioeconomic and educational status between the study subjects in the two different study areas.

In our study out of 150, 67 (44.7%) women were mildly anaemic and 34 (22.7%) had moderate degree of aneamia while only 11 (7.3%) were severely anaemic. Kar K et al (2006) in Cuttack city observed 63%, 18% and 12% prevalence of mild, moderate and severe anaemia in their study. Similarly Hossain B et al (2013) found that 42%, 38% and 9% urban pregnant women had mild, moderate and severe anaemia respectively. But in contrast with our results Kumar V et al reported that majority of study subjects 49.6% were suffering from Moderate degree of anaemia and 16.8% were mildly anaemic while none of the women had severe degree of anaemia. 11

It is evident from the current study that there was no significant association between anaemia and age of the women. Similarly Lokare PO et al also observed that difference was not statistically significant.⁵

We observed that the association of anaemia with religion was found to be statistically significant. This may be due to different dietary habits and food taboos prevalent in different religions of our country. Similar association was also seen in a study conducted by Lokare PO et al in Aurangabad city. But Kumar V et al (2014) did not observe any significant association in their study. 11

We found that anaemia was significantly more common in Scheduled Castes (88.7%) as compared to women of other castes. RS Balgir et al (2011) in eastern coast of Odisha also reported almost similar prevalence of anaemia in the women of Scheduled Castes. ¹² A study done by Arlappa N et al in rural area of Maharashtra, also reported that the risk of anaemia was significantly higher among pregnant women belonging to scheduled caste and scheduled tribe communities. ¹³ This is consistent with our study.

In the present study we found that anaemia had a significant inverse association with educational attainment of the women. Similar significant association was also seen in other studies conducted by Lokare PO et al in Aurangabad city and Ansuman Panigrahi et al (2011) in Bhubaneswar, ^{5,14} whereas kumar V et al did not found any significant association between anaemia and educational status of the women. ¹¹ But in contrast with our study Mihiretie H et al reported significantly higher prevalence of anaemia among literates women than illiterates and kefiyalew F et al (2014) in south east Ethiopia also observed that anaemia was more common in literates (32%) than illiterates (25.3%). ^{15,8}

In our study, the association of anaemia with socioeconomic classes was found to be statistically highly significant (p=0.0066) and it come out to be important risk factor in development of anaemia in pregnancy. This might be due to availability and affordability of high-quality food with better socioeconomic status. Similar observation has been documented by other authors in their study.^{5,13,16} But Kumar V et al reported that association was not significant.¹¹

We noted that anaemia was more common in second trimester (73.4%) but we did not found any significant association between prevalence of anaemia and gestational age. Kumar V et al and kefiyalew F et al in their studies also portrayed the same fact. But Mihiretie H et al in their study in Ethiopia had found that gestational age (trimester) is an important determinant of anaemia in pregnancy. 15

The current study revealed that anaemia is significantly more common in multiparous women than primi and nulliparous which is concordance with other studies.^{4,11,17} This is because Multiparous women tend to have greater menstrual losses that increase with parity. But contrast result was noted in a study done by Kefiyalew F et al in Ethiopia.⁸ This may be due to geographical variation and variation in method and study subjects.

CONCLUSION

In the light of the above observations, we inferred that prevalence of anaemia in pregnant women was found to be high specially among Hindus, Schedule caste, illiterates, low income group and Multiparous women, indicating very poor maternal and child health care in the region. So there is a need to intensify IEC activities to promote early antenatal care, dietary modification and utilization of family planning services specially in under privileged population of the region.

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