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Original Research Article

Prevalence of anemia in pregnancy in rural Warangal

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ABSTRACT

Background: Anemia in pregnancy associated with a lot of maternal and fetal deaths. This study was aimed to estimate the prevalence of anemia in pregnant women in rural India. It is an important factor which is associated with a number of maternal and fetal complications. It is a major contributor to poor pregnancy and birth outcomes in developing countries. This study aims at finding the prevalence of anemia among pregnant women living in rural Warangal and to determine the socio-demographic features of pregnant women.
Methods: A community based cross-sectional study was conducted in Wardhanapet, the rural field practicing area of Kakatiya Medical College, Warangal, Telangana. Study was done from 01 January 2021 to 30 July 2021. All pregnant women between the ages of 15 and 49 years were included in the study.
Results: Among 382 subjects, the prevalence of anemia was 62%. Of them, 40% (n=130) had mild, 55% (n=155) had moderate anemia and 5% (n=12) had severe anemia. Significant association was found between anemia and parity, birth spacing, intake of iron and folic acid tablets (IFA) tablets, education and type of diet. There was no association between age of the subject, age at first conception and socioeconomic status.
Conclusions: The prevalence of anemia is 62%, efforts to identify modifiable factors of anemia the importance of prevention of anemia must be reinforced in pregnant women.

Keywords: Anemia, Hemoglobin, Pregnancy, Rural health, Maternal and child health

INTRODUCTION

Anemia is a serious global public health problem and the World Health Organization (WHO) estimates that 40% of pregnant women worldwide are anemic.

Anemia is a condition in which the number of red blood cells (RBC) or the hemoglobin concentration in them is lower than normal which results in decreased oxygen carrying capacity of the cells to the tissues. This results in fatigue, weakness, dizziness and shortness of breath, among others.[1]

Anemia during pregnancy is an important factor which is associated with a number of maternal and fetal complications like intra uterine growth restriction, premature delivery, low birth weight (LBW) and maternal and child mortality. It decreases a woman's reserve to bleed during or after childbirth.[2] Maternal complication includes preeclampsia, antepartum hemorrhage, puerperal sepsis, and thromboembolic complications leading to subinvolution of the uterus, failure of lactation, and delayed wound healing.[3]

During pregnancy anemia occurs due to increased demand of iron for the growing fetus and placenta; and increased red blood cell mass (with expanded maternal blood volume in the third trimester), which is further aggravated by childbearing at an early age, repeated pregnancies, short

intervals between pregnancies and poor access to antenatal care and supplementation.[2]

About half of all global maternal deaths are due to anemia and India contributes to about 80% of the maternal death due to anemia in South Asia.[2] The prevalence of anemia among pregnant women in India is 50.4%.[4] The prevalence of anemia is 53.2% in Telangana, of which 54.4% of anemic pregnant women belong to the rural areas.[5] It is estimated that anemia is the underlying cause for 20–40 per cent of maternal deaths in India.[6]

The most common causes of anemia in pregnancy are nutritional disorders like folate, vitamin B12 and vitamin A deficiency and infections like parasitic infections, chronic inflammation and inherited disorders.[2]

Anemia has major consequences on human health as well as social and economic development. First, anemia reduces women's energy and capacity for work and can therefore threaten household food security and income. Second, severe anemia in pregnancy impairs oxygen delivery to the fetus and interferes with normal intra-uterine growth. Therefore, anemia 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.[6]

This study aims at finding the prevalence of anemia among pregnant women living in rural areas of Warangal, to determine the extent and severity of anemia, to determine the presence of dietary factors associated with anemia and to determine the socio-demographic features of pregnant women.

METHODS

A community based cross-sectional study was conducted in Wardhanapet, the rural field practicing area of Kakatiya medical college, Warangal, Telangana. Informed consent was obtained from the participants, and approval from the institutional ethics committee of Kakatiya Medical College was obtained before the commencement of the study. All pregnant women between the ages of 15 and 49 years who reside in the rural field practicing area of Kakatiya Medical College were included in the study. Pregnant women who refuse to give consent to take part in the study were excluded from the study. The sample size was calculated by using the formula given.

$$N = \frac{Z^2 \times P \times Q}{L^2}$$

The minimum sample that was required for this study was 382 pregnant women. Where N is estimated minimum sample size; Z is confidence level at 95% (standard value is 1.96); P is proportion (prevalence of anemia during pregnancy 54.4%, NFHS-5); and L is precision at 95% CI=0.05.

Simple random sampling was done and the study subjects were recruited from the community accordingly. Data was collected using a pre-designed, semi-structured questionnaire. The data comprised of socio-demographic data and factors associated with anemia. Socio-economic status was calculated by modified B. G. Prasad scale.[7] Hemoglobin cut-off for anemia during pregnancy was taken as per WHO criteria.[8]

Table 1: Hemoglobin.

Normal (g/dl)	Mild (g/dl)	Moderate (g/dl)	Severe (g/dl)
≥11	10-10.9	7 – 9.9	<7

Data was entered in Microsoft excel and statistical analysis of data was carried out using statistical package for the social sciences (SPSS) and Chi-square test to analyze variables. P value of <0.05 was considered significant.

RESULTS

The study comprises of 382 participants, the mean age being 24.7±4.9. The overall prevalence of anemia was 62% (n=237). 40% (n=95) of the study participants had mild anemia, 55% (n=130) had moderate anemia and 5% (n=12) had severe anemia.

Table 2: The sociodemographic characters of the study population.

Variables	Frequency	Percentage
Age (years)		
15-20	69	18
21-25	175	46
26-35	134	35
>35	4	1
Education		
Illiterate	231	60.4
Literate	151	39.5
Religion		
Hindu	212	55.6
Christian	122	32
Muslim	48	12.4
Socio-economic status		
Upper class	66	17.3
Upper middle class	152	40
Middle class	115	30
Lower middle class	41	10.7
Lower class	8	2
Type of family		
Nuclear	210	55
Joint family	74	19.3
Three generation family	98	25.6

Table 2 shows that majority (46%) of the participants belong to 21-25 years age group. 60.4% of the participants are illiterate and 39.5% are literate. Majority (55.6%) of

the participants belong to Hindu religion. Most of the participants belong to upper-middle class (40%). 55% of the study participants come from a nuclear family.

Table 3 shows that 67% of the participants were in their second trimester, followed by third (17.7%) and first (15.3%). There are more multigravida women (58%) than primigravida women (42%). 58% of the participants have more than two years of birth spacing between consecutive pregnancies. Most of the participants (44%) first conceived between the ages of 21-25 years.

Table 3: Obstetric factors of study participants.

Obstetric factors	Frequency	Percentage
Trimester		
First	59	15.3
Second	256	67
Third	67	17.7
Gravida		
Primigravida	160	42
Multigravida	222	58
Birth spacing (years)		
<2	161	42
>2	221	58
Age at first pregnancy		
<20	122	32
21-25	169	44
>26	91	24

Table 4 shows that out of the study participants, only 68% consumed IFA tablets regularly. 79% of the participants ate a mixed diet while 20.6% were vegetarians.

Table 4: Dietary factors of the study population.

Dietary factors	Frequency	Percentage
IFA tablet intake		
Taken	260	68
Irregularly taken	122	32
Diet		
Mixed	302	79
Vegetarian	79	20.6

In Table 5, we can see the prevalence of anemia among the study participants. Out of 382 participants, 38% had normal hemoglobin levels and 62% were found to be anemic. Of them, 40% had mild anemia, 55% had moderate anemia and 5% had severe anemia.

Table 5: The prevalence of anemia in the study participants.

Prevalence of anemia	Frequency	Percentage
Normal	145	38
Anemic	237	62
Mild	95	40
Moderate	130	55
Severe	12	5

As shown in the above Table 6, education, gravida of the participant, intake of IFA tablets was significantly associated with the presence of anemia. However, factors like age of the participant, socioeconomic status, age at first pregnancy and birth spacing were not found to be significantly associated.

Table 6: Association of demographic factors with the presence of anaemia.

Characteristics	Mild		Moderate		Severe		P value
	n	%	n	%	n	%	
Age							
15-20	27	11.4	35	14.65	3	1.2	0.35
21-25	48	20.4	75	31.8	6	2.5	
26-35	19	7.6	19	8	2	1	
>35	1	0.6	1	0.6	1	0.3	
Education							
Illiterate	28	11.8	88	37.2	2	0.8	0.0001*
Literate	67	28.2	42	17.7	10	4.2	
Socio-economic status							
Upper class	10	4.2	17	7.2	0	0	0.03
Upper middle class	12	5.1	28	11.8	2	2	
Middle class	24	10.3	36	15.2	3	1.2	
Lower middle class	16	6.4	30	12.7	2	0.7	
Lower class	33	13.7	19	8	5	2.1	
Age at first pregnancy							
<20	26	11	52	21.7	2	1	0.10
21-25	45	19.1	59	24.8	6	3	
>26	23	9.9	19	8	4	2	

Continued.

Characteristics	Mild		Moderate		Severe		P value
	n	%	n	%	n	%	
Gravida							
Primi gravida	70	29.3	111	47.2	6	2.5	
Multi gravida	23	9.6	19	8.1	6	2.5	0.0006*
Birth spacing (years)							
<2	46	19.5	69	28.9	8	3	0.45
>2	49	20.5	61	26.1	4	2	
IFA tablets							
Regular intake	89	37.6	90	38	3	1.4	0.001*
Irregular intake	6	2.4	40	17	9	3.6	
Diet							
Mixed diet	90	38	94	40	3	1.2	0.001*

*P value <0.05 is considered significant

DISCUSSION

In our study, we used the WHO anemia classification to determine the presence of anemia. The study participants with mild anemia were 40%, moderate anemia were 55% and 5% had severe anemia. When compared to a study done by Sinh et al, majority had moderate anemia (60.5%, n=121) followed by mild anemia in 29% (n=58) and 0.5% (n=1) had mild anemia.[9] In another study done by Desalegn (74.3%) had moderate anemia (7-10 g Hb/dl). 2.5% had severe anemia (7 g Hb/dl).[10] In the present study, 55% (n=210) belonged to nuclear family whereas in a study done by Abbasi et al majority (43%) of the women belonged to nuclear family.[11]

There was no significant association between age and anemia in the current study. Similar results were seen in a study done by Bharati et al where there was no association with age of the participant.[12]

In the current study, significant association was found between anemia and education of the participant where anemia was more in illiterate participants (43.8%). Similar results were seen in a study conducted by Abbasi et al where significant association was seen between anemia and education of the participant.[11]

Socio-economic status of the participants was significantly associated with the presence of anemia in the present study. Anemia was more prevalent in participants who belonged to lower socioeconomic class (43.6%). There was significant association in other study done by Lebso et al.[13]

In a study done by Mangle et al, approximately 50% of the total cases of severe anemia and 72% of the total cases of very severe anemia were found in those females who had their first pregnancy below the age of 19 years.[14] But in the present study, no such association was found.

In the current study, significant association was found between the number of pregnancies and anemia. Similar results were found in a study done by Kundap et al which shows that as gravida status of study subjects goes on increasing from primi to multi the anaemia prevalence goes on increasing.[15]

A short birth interval between pregnancies was associated with anemia in pregnancy (100% for 12 months versus 33.3% for 24 months; p=0.01) in a study done by Desalegn et al similar results were seen in the present study as there was a significant association between spacing between births and anemia.[10]

Intake of iron supplements was found to be protective against anemia in a study done by Makhoul et al.[16] In the current study, significant association was seen between intake of IFA and anemia.

In the present study, intake of vegetarian diet lead to anemia but in studies conducted by Tan et al, there was no conclusive evidence to associate anemia with vegetarian diet.[17] But in a study conducted by Kundap et al, significant association was found between type of diet and anemia.[15]

Limitations

As existing lab reports were used to find the prevalence of anemia, the prevalence might be slightly different from what has been summarized. There might be slight differences between ranges from different labs. This could not be overcome as we did not have enough resources to conduct the blood test on field.

CONCLUSION

As prevalence of anemia is 62%, efforts to identify modifiable factors of anemia the importance of prevention of anemia must be reinforced in pregnant women. The use of iron tablets during pregnancy must be encouraged and all mothers should be educated about the importance of iron supplementation. As the spacing between pregnancies increases the chance of suffering from anemia, all pregnant women must be advised to keep a space of 3-5 years between each birth. The importance of a proper balanced diet must be told and mothers should be encouraged to eat well during pregnancy to avoid anemia.

Recommendations

The findings from this study educate the pregnant women to avoid the anemia related complications. Utilize the primary health care services and to attend timely antenatal visits.

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