



ORIGINAL RESEARCH PAPER

Obstetrics & Gynaecology

PREVALENCE AND DETERMINANTS OF SEVERE ANAEMIA AMONG ANTENATAL WOMEN ATTENDING A TERTIARY CARE HOSPITAL IN MANIPUR

KEY WORDS: anaemia, severe, outcome, pregnancy

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ABSTRACT

Introduction: WHO defines anaemia in pregnancy as haemoglobin <11 gm/dl and severe anaemia as haemoglobin < 7gm/dl. Anaemia is a major health concern during pregnancy particularly for the developing countries like India. Not many studies have been done so far regarding this health issue in this part of the country. Hence, this study was done to estimate the magnitude of the problem with focus on severe anemia.

Objectives: To determine the prevalence of anaemia among pregnant women attending JNIMS Hospital, Manipur and classify the grades of anaemia and determine the factors leading to anaemia and study the outcomes of severely anaemic patients.

Materials and methods: A prospective, hospital-based study was conducted in the Department of Obstetrics and Gynaecology, Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Porompat, from August 2017 to April 2019 among pregnant women in second and third trimesters in a 20 months' duration, in a twice weekly survey, recruitment was done on all eligible women attending Obstetrics and Gynecology OPD, JNIMS using a pre-tested semi-structured questionnaire. Haemoglobin was measured using colorimetry method. All the very severely anaemic study-subjects were followed up for any interventions given and the pregnancy outcome until discharged alive or death. Data was analysed by SPSS version 20. Mean, standard deviation, Chi square test etc. were used for analysis. The study was approved by the Institutional ethics committee.

Results: The prevalence of anaemia was found to be 30.8%; mild anaemia was found in 288(17.9%), moderate in 124 (7.8%) and severe anaemia was 82 (5.1%). Severe anaemia was found to be significantly associated with age group 34 years and above, Muslim community, rural residence, being illiterate, ANC less than three times, never taken supplemental iron, with increasing gravida and booking ANC visit after 12 weeks. Blood transfusion was given to 62 out of 82 (75.6%) patients and 20 patients (24.3%) received parenteral iron. Six patients (7.3%) had associated pre-eclampsia, 3 (3.6%) had ante-partum haemorrhage, and 4 (4.8%) had associated post-partum haemorrhage. There were 6 (7.3%) intrauterine deaths, 10 preterm deliveries (12.1%), and 7 low birth weight babies (8.5%). There was one maternal mortality with the baby in utero.

Conclusion: Almost around a third of the pregnant women suffered from anaemia with a sixth of them having severe anaemia. Three fourths of the pregnant women having severe anaemia received blood transfusion. Severe anemia was associated with pre-eclampsia, ante-partum haemorrhage and post-partum haemorrhage, intra-uterine deaths, preterm deliveries, low birth weight and maternal mortality. Regular antenatal checkups, adequate intake of iron and folic acid tablets and proper age at the time of pregnancy should be encouraged.

INTRODUCTION:

Anaemia of serious concern in developing countries as it significantly contributes to both maternal and fetal morbidity and mortality. WHO defines anaemia in pregnancy as haemoglobin <11 gm/dl and severe anaemia as haemoglobin < 7gm/dl.¹ The Centre for Disease Control and Prevention (CDC) (1998) defined anaemia in iron supplemented pregnant women using a cut off of the 5th percentile- 11gm/dl in the first and third trimesters, and 10.5gm/dl in the second trimester.² Iron deficiency is the most common cause of anaemia in pregnancy and it is primarily nutritional deficiency. Women who receive iron supplementation are less likely to have iron deficiency anaemia at term pregnancy.

According to NFHS 4 (2015-2016), the prevalence of anaemia among pregnant women in India is 50.4%, and that in Manipur is 26.4%. Again, according to the survey, the national prevalence of severe anaemia is 1.8% and that of Manipur is 0.3%.^{3,4}

Severe anemia is associated with palpitations, tachycardia, breathlessness, increased cardiac output leading on to cardiac stress which can cause de-compensation and cardiac failure which may be fatal. There is increased incidence of pre-term labour, pre-eclampsia and sepsis with severe anaemia. Fetuses tend to have decreased iron stores due to depletion of maternal stores. Adverse perinatal outcomes include pre-term and small-for-gestational-age babies and

increased perinatal mortality rates.

Treatment varies from oral iron therapy, parenteral iron therapy and blood transfusion.

Anaemia is a major health concern during pregnancy particularly for the developing countries like India. Not many studies have been done so far regarding this health issue in this part of the country. Thus this study was done to determine the prevalence of different grades of anaemia and factors leading to anaemia among pregnant women attending JNIMS Hospital, Manipur and to study the outcomes of severely anaemic patients.

MATERIAL AND METHODS

A prospective, hospital-based study was conducted in the Department of Obstetrics and Gynaecology, Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Porompat, from August 2017 to April 2019 which is a tertiary care hospital in the Imphal East district of Manipur, India. Patients attending the hospital come from different parts of Manipur. Study population included pregnant women attending Obstetrics and Gynecology OPD, JNIMS. Pregnant women in second and third trimesters and has signed a written informed consent were included in the study. Pregnant women with haemoglobinopathies or bleeding disorders, chronic kidney disease and severe liver disease were excluded. Based on the prevalence of 6.8% of severe anaemia⁵ at an alpha level of 5% and absolute allowable error of 1.25%, using the formula

Characteristics	Number	Percentage
Age group (years)	<18	4.8
	18-25	32.4
	26-33	45.2
	34-41	16
	>41	1.6
Religion	Hindu	62.3
	Muslim	17.1
	Christian	14
	Others*	6.6
Residence	Rural	61.8
	Urban	38.2
Per Capita Income (modified BG Prasad classification)	<929 (5)	2.3
	930-1859 (4)	23.2
	1860-2099 (3)	51.1
	3100-6199 (2)	19.3
	>6200 (1)	4.3
Educational Status	Illiterate	19
	Primary	27.5
	High school	42.6
	Higher secondary	7.8
	Graduate and above	3.1

Parity	P0-2	1468	91.8
	P3-5	118	7.4
	P6-8	14	0.8

*others include Sanamahism, Tingkao Ragwang religion which are indigenous religion of Manipur.

Almost half of the patients belonged to the age group of 26-33 years (45.2%). 62.4% of the study population came from rural areas. Majority i.e. 995 (62.4%) of the population studied belonged to Hindu community. Only 19% of them were illiterate, while maximum were educated and 1468 (91.8%) of the study population belonged to parity 0 to 2.

Table 2: Characteristics pertaining to obstetrics history of the participants

Characteristics	Frequency	Percentage	
Menstrual history	No menorrhagia	42	2.6
	H/o menorrhagia	1558	97.5
Period of gestation	<28 weeks	22	1.3
	28-36 weeks	388	24.3
	37-40 weeks	1190	74.5
Number of antenatal check-ups	<3	202	12.5
	3-5	632	39.5
	>5	766	47.9
1 st ANC	1 st month	202	12.6
	2 nd month	633	39.6
	3 rd month	585	36.5
	>12 weeks	180	11.3
Duration of taking iron supplements	<3 months	304	19
	>3 months	1218	76.2
	Never	78	4.8
Iron profile	Normal	4	0.3
	Iron deficiency	136	8.5
	Investigation not available	1460	91.25

Serum iron profile was not done routinely for the study. It was done only in few patients (140 women) according to the affordability of the patients.

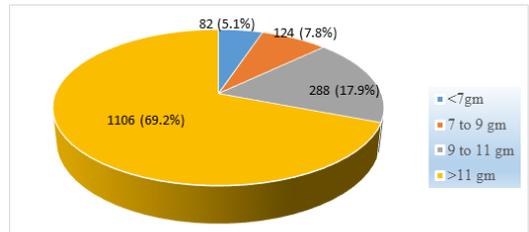


Fig 1: Distribution of the levels of haemoglobin among the participants

Table 4: Association of haemoglobin with socio-demographic characteristics

Variables	Categories	Haemoglobin			P-value
		<9	9 to 11	>11	
Age	Till 33 years	142 (10.8%)	252 (19.1%)	922 (70.1%)	0.0001
	34 years and above	64 (22.7%)	34 (12.1%)	184 (65.2%)	
Religion	Hindu	98 (9.8%)	176 (17.7%)	721 (72.5%)	0.0001
	Muslim	60 (22%)	52 (19%)	161 (59%)	
	Christian	34 (15.2%)	42 (18.8%)	148 (66.1%)	
Address	Rural	156 (15.8%)	190 (19.3%)	641 (64.9%)	0.0001
	Urban	50 (8.2%)	96 (15.7%)	465 (76.1%)	
Education	Illiterate	114 (37.5%)	58 (19.1%)	132 (43.4%)	0.0001
	Literate	92 (7.1%)	228 (17.6%)	974 (75.3%)	
Socio-economic	Till lower middle class	30 (8%)	46 (12.2%)	300 (79.8%)	0.0001
	Middle class and above	176 (14.4%)	240 (19.6%)	806 (66%)	
First ANC visit	Till 12 weeks	80 (5.6%)	260 (18.3%)	1078 (76%)	0.0001
	>12 weeks	126 (70%)	26 (14.4%)	28 (15.6%)	
Number of ANC visits	< 3 times	120 (60%)	42 (21%)	38 (19%)	0.0001
	3 times or more	86 (6.2%)	244 (17.5%)	1068 (76.4%)	

Duration of iron intake	< 3 months	164 (43.2%)	82 (21.6%)	134 (35.3%)	0.0001
	>3 months	42 (3.4%)	204 (16.7%)	972 (79.8%)	
Gravida	Multigravida	138 (9.2%)	276 (18.4%)	1084 (72.4%)	0.0001
	Grand multigravida	68 (68%)	10 (10%)	22 (22%)	

It was found that 136 patients had low iron reserve on serum iron profile. 73 out of 82 severely anaemic patients and 63 out of 124 moderately anaemic patients had deranged iron profile (low ferritin, decreased level of serum iron, increased TIBC) i.e. suggestive of decreased iron stores.

8.5% of severely anaemic patients (15 out of 82) were found to have occult blood, ova and cysts in stool indicating some intestinal helminthic infection.

In our study, 82 (5.1%) patients were found to have haemoglobin <7 gm%. 62 (75.6%) patients received blood transfusion, out of which 49 (59.7%) received only blood while, 13 (15.8%) of them were given parenteral iron following blood transfusion. Twenty (24.3%) patients were given only parenteral iron. Out of those who received blood transfusion, 4 of them required 3 and 3 of them required up-to 4 units of packed RBCs (PRBCs).

Sixty-six (80.4%) of the severely anaemic patients delivered vaginally, 3 (3.6%) had instrumental delivery, 12 (14.6%) underwent LSCS for associated obstetric condition or fetal compromise. 4 (4.8%) patients required admission in intensive care unit. 6 (7.3%) patients had associated pre-eclampsia, 3 (3.6%) had ante-partum haemorrhage, and 4 (4.8%) had associated post-partum haemorrhage. There were 6 intrauterine deaths (7.3%), 10 preterm deliveries (12.1%), and 7 low birth weight babies (8.5%). There was one maternal mortality with the baby in utero.

DISCUSSION

Anaemia is one of the most commonly encountered medical disorders during pregnancy and nutritional anaemia is the most common cause of it. According to NFHS 4 (2015-2016)³, the prevalence of anaemia among pregnant women in India is 50.4%, and that in Manipur⁷ is 26.4%. Again, according to the survey, the national prevalence of severe anaemia is 1.8% and that of Manipur is 0.3%. These studies being community-based, the proportions are likely to be lower than the present study finding which was a hospital-based study.

Several studies have been done throughout India regarding the various factors responsible for anaemia in general and anaemia in pregnancy. Rajamouli J⁶ found that the prevalence of anemia was 58.36% including mild, moderate and severe anemia. Highly significant factors association was found with the mother's age, education, socio-economic status, parity and dietary habits. Verma P et al¹ found out in her study done on 764 pregnant women that the prevalence of severe anaemia was 4.7%, which is comparable with the prevalence of 5.1% in our study. Srilatha J et al⁵ also had found out that 59.9% of the pregnant women in their study were anaemic, and the prevalence of mild, moderate and severe anaemia were 19.8%, 33.3% and 6.8% respectively. In another study, Prashant D et al² had found 72.7% prevalence of anaemia, out of which 2.2% were found to be severely anaemic, 33.2% had mild anaemia and 37.2% had moderate anaemia. In our study, the total prevalence of anaemia was found to be lesser (30.8%). Also, the prevalence of mild and moderate anaemia were 17.9%, and 7.8% respectively. The differences may be due to the study setting and due to the fact that the main diet of Manipur is of green leafy vegetable and pregnant women taking more locally available seasonal fruits.

Swarnlatha N et al⁸ had observed that the prevalence of anaemia is more among age group <20 years. In our study, the prevalence of severe anaemia was found to be the highest among the age group of <18 years, while the prevalence of anaemia was maximum in the age group of 34-41 years. The

discrepancy may be because of the difference in the sample sizes.

In our study it was observed that the prevalence of anaemia is more among the Muslims (41%) compared to Christians (34%) and Hindus (27.5%) and in Rajasthan, Babita et al¹⁰ observed that the prevalence of anemia was much more in women belonging to Muslim community (92.3%) as compared to Non-Muslim (81.1%) because of less health awareness, extreme poverty, large family size and overcrowding leading to recurrent infection in this caste resulting into anemia.

Judith et al¹¹ had in the findings of their study revealed that the prevalence of anaemia was higher among women belonging to low socioeconomic status and women with short pregnancy intervals and higher parity. Swarnlatha N⁸ had found 71.9% prevalence of anaemia among women from rural areas. While, in our study, we have found 35.1% prevalence of anaemia among women from rural areas. This may be because of the differences in the dietary habits of Manipur and other parts of India where rural Manipuri people diet is more of green leafy vegetables and locally available seasonal fruits.

Swarnlatha N⁸ also had found a high prevalence of anaemia among illiterates (88.2%), per-capita monthly income less than Rs 740/- (93.0%), multi-gravida (79.9%). In our study, we have found 56.6% prevalence of anaemia among illiterates, 49.7% among those with per capita income of Rs. 930-1859, 56.2% among gravida 4 to 6, and 91% among gravida 7 to 9, when the prevalence in gravida 1 to 3 was only 26.1%. The findings were found to be similar in both the studies.

It was also found in the study conducted by Idowu OA et al¹² that the prevalence of anaemia among those women who booked for antenatal care in the 1st trimester, 2nd trimester and 3rd trimester were respectively 9.8%, 63.5%, and 26.6%. We observed similar findings in our study. The later the booking visit, the more is the prevalence of anaemia. The prevalence among those who booked for ANC at 1st month, 2nd month and 3rd month were 17.8%, 17.7% and 32.9% respectively, while the prevalence among those who booked for ANC after the 1st trimester was 84.4%.

It was seen in a study done by Stephen G et al¹³ that women who attended ANC 4 or more times had lower prevalence of anaemia (17.4%) than those who attended only once (35.3%). In our study, the prevalence of anaemia with less than 3 ANC's was 81%, with 3 to 5 ANC's was 31.6%, and with >5 ANC's was only 17%. The findings were similar in both the studies.

Mishra S et al¹⁴ had seen that the prevalence of anaemia was significantly lower (53%) in those who have consumed 100 iron-folic acid tablets. The finding was similar in our study although the value was much lower (20.2%).

Ravishankar S¹⁵ had observed varying outcomes in their study viz. difficult labour (3%), postpartum haemorrhage (1.6%), pre-eclampsia (1.6%), stillbirths/ abortions (3.5%). The fetal complications include low birth weight (24.5%), premature delivery (0.2%), and birth asphyxia (0.5%). Manisha Nair et al¹⁶ had seen that women with severe anaemia had a higher odds of PPH, low birth weight baby, small for gestational age babies and perinatal death. Similar outcomes were all seen in our study too. Out of 82 severely anaemic women, 6 (7.3%) patients had pre- eclampsia, 3(3.6%) had ante-partum haemorrhage, and 4 (4.8%) had post-partum haemorrhage. Further, there were 6 intrauterine deaths (7.3%), 10 preterm deliveries (12.1%), and 7 low birth weight babies (8.5%).

There was also one maternal mortality with the baby in utero.

As the present study was a hospital-based one, the findings do not reflect the true prevalence of anemia in the state. There were also very few participants from the earlier gestations.

CONCLUSION

The prevalence of anaemia in the present study was found to be 30.8%. Also, the prevalence of severe anaemia was 82 (5.1%). Severe anaemia was found more among those belonging to the age group 34 years and above and this association was found to be statistically significant. Respondents belonging to the Muslim community, rural residence, being illiterate also had more prevalence of severe anaemia and these associations were found to be statistically significant. Also, there was significant association of severe anaemia with ANC less than three times, never taken supplemental iron, with increasing gravida and booking ANC visit after 12 weeks. Blood transfusion was given to 62 out of 82 (75.6%) patients and 20 patients (24.3%) received parenteral iron. Four patients required admission in intensive care unit. Six patients (7.3%) had associated pre-eclampsia, 3 (3.6%) had ante-partum haemorrhage, and 4 (4.8%) had associated post-partum haemorrhage. There were 6 (7.3%) intrauterine deaths (7.3%), 10 preterm deliveries (12.1%), and 7 low birth weight babies (8.5%). There was one maternal mortality with the baby in utero.

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