Study of Prevalence of Anaemia in Pregnant Female and Association of Adverse Maternal Outcome with Severity of Anaemia

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ABSTRACT

Introduction: Anemia of pregnancy is a global public health challenge affecting two billion of the world's population, predominant among the women of reproductive age group. According to WHO, 14% of pregnant women in developed countries, 56% in developing countries and 65-75% in India are anemic. Anaemia directly causes 20% of maternal deaths in India and indirectly accounts for another 20% of maternal deaths. Study aimed to evaluate the prevalence of anemia in pregnant females, classifying patients according to degree of anemia and its association with adverse maternal outcomes.

Material and methods: The patients included in the study were anemic patients who were about to deliver within 3-4 days either in labor or not in labor. Assessment of anemia was done by hematological workup done after admission, and patients were classified as mild, moderate, severe anaemia. Patients were observed during delivery and in postpartum period and outcomes were assessed as postpartum hemorrhage, puerperal pyrexia, deep vein thrombosis, failure of lactation, subinvolution and maternal mortality.

Results: In our study, out of 314 patients, 7.6% patients fall in severe category. The mean haemoglobin level in present study is 8.65 gm/dl. The mean age group in present study 23.49 yrs. Majority of women belongs to upper lower class around 48.7%, according to Kuppuswamy classification. The severity of anaemia was significantly associated with low socioeconomic group. Majority of patients were multigravida and prevalence of anaemia was higher in them. 108 anaemic mothers had PPH. 83.3% patients with severe anaemia had PPH, which was highly significant. 62.5% severely anaemic patients had puerperal sepsis. There was significant association between severity of anaemia and development of puerperal sepsis. Out of 314 patients, 24% had lactation failure and 50% had subinvolution, which were both significantly associated.

Conclusion: The prevalence of anaemia in pregnant women was found to be high specially among multiparous women of reproductive age group (21-30 years) and those belonging to low socioeconomic status. Timely identification of women with severe anemia and associated maternal complications during intrapartum and postpartum period like, postpartum hemorrhage, puerperal sepsis, failure of lactation and subinvolution can help in reducing maternal morbidity and mortality.

Keywords: Anaemia, Postpartum Hemorrhage, Lactation Failure, Subinvolution

affects 1.62 billion people globally with about 293 million children of preschool age, 56 million pregnant women and 468 million non-pregnant women.[1] Although the prevalence of anaemia is estimated to be 9 % in developed countries, it is as high as 43% in developing countries .[2] Anaemia directly causes 20% of maternal deaths in India and indirectly accounts for another 20% of maternal deaths .[3] India constitutes 22000 of total 50000 maternal deaths occurred due to anaemia per year .[4] Knowledge of prevalence of anemia in pregnant women is fundamental for the planning and execution of effective interventions by health authorities. In South Asian countries anaemia of pregnancy ranged from 18-80%, amongst whom 2.7 to 20% were suffering through severe anaemia having a hemoglobin range of 5.0 gm/dl to 7 gm/dl .[5] India being a heavily populated country with predominance of malnourishment has a severe burden of anaemia in pregnancy, hence many surveys were conducted for its prevalence like Indian Council Medical Research in 1989,[6] which demonstrated that 87.6 percent women had hemoglobin (Hb) <10.9g/dl. Further, ICMR in 1992[7] reported that in 6 states supplementation of iron folate tablets to control anemia (women with hemoglobin<7.0 g/dl were excluded) had 62 percent women as responders. Even after consuming 90 tablets, 37.8 percent women had hemoglobin less than 10g/dl and 19.4 percent had less than 9 g/dl. In a study conducted by Rohila M. et al of 4456 antenatal women, concluded 17.9% (798) were anemic patients out of whom 2.15 % (96) were severely anemic, 6 women out of 96 died due to severe anaemia.[8] The cause of death was atonic PPH leading to multiorgan dysfunction, cardiac arrest in second stage of labor and blood transfusion reaction, which was secondary to severe anemia. Anaemia was classified into mild, moderate, severe and very severe according to ICMR in 1989 as shown in the table below[9]

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INTRODUCTION

Anemia is a global health challenge with prevalence of anemia to be 25% worldwide. In absolute numbers, anemia

Category (Anemia severity)	Haemoglobin level (g/dl)
Mild	10.0-10.9
Moderate	7.0-9.9
Severe	<7.0
Very severe	<4.0

According to WHO criteria, hemoglobin concentration of less than 11 gm/dl and haematocrit of 0-33% is declared as anaemia in pregnancy. Anaemia in pregnancy is a condition with effects that may be deleterious to mother and fetus. In the case of moderate to severe anaemia, breathlessness, oedema, congestive heart failure, and even cerebral anoxia have been observed. Maternal mortality was 7% in anemic pregnant women as compared to controls (3%). Anemic mothers do not tolerate blood loss during childbirth; as little as 150 ml can be fatal. Normally, a healthy mother during childbirth may tolerate a blood loss of upto 1000 ml.[10] Maternal complications include premature labor, poor weight gain, premature rupture of membrane (PROM) and dysfunctional labor[11] during intranatal and postnatal period the complications would be postpartum hemorrhage, puerperal sepsis, subinvolution of uterus, deep vein thrombosis leading to embolism and poor lactation. Anaemia in pregnancy and its management remains an important issue in perinatal medicine. We intend to find out the status of mother after delivery anemic women. There is a need to streamline the diagnostic criteria and so is its rationale management. Since the literature available is scanty about the maternal outcome, hence this study was carried out to study the effects of anemia on pregnancy and its ill effects on maternal health.

MATERIAL AND METHODS

This was a prospective observational study to observe the effects of maternal anemia on mother. In this study pregnant anaemic women in labour visiting Obstetrics and Gynaecology department for a period of 1 year were included, which was 314 in number. An informed and written consent was obtained before including them in the study. As

Degree of anemia	No. of cases	Percentage
Mild	39	12.4
Moderate	251	79.9
Severe	24	7.6
Total	314	100.0

Table-1: Distribution of women according to degree of anaemia

our objective was to study effect of anaemia on mother, we required women who was to deliver in coming 3-4 days. As a routine, all women who were admitted in obstetric ward undergo haematological workup. We included women who were in labour as well as those who were not in labour. We restricted to enrol patients who were anaemic for no obvious reason. Out of all uncomplicated pregnancies, we selected women having anaemia i.e. Hb< 11 gm/dl. We categorize them according to ICMR classification, haematological assessment of patient was done by assessment of haemoglobin and haematological indices like Mean corpuscular volume, Mean corpuscular haemoglobin and Mean corpuscular haemoglobin concentration. All the women were followed in delivery as well as in postnatal period till discharge from the hospital. As a part of obstetric history and demographic data, various parameters were noted which were demographic details as age, education, occupation and socio economic status. Obstetric history was taken in detail to rule out high risk in patient. Intrapartum monitoring of patient was done. Post delivery status of patient was noted which include any episode of postpartum haemorrhage, puerperal pyrexia, deep vein thrombosis, failure of lactation and subinvolution.

RESULTS

The clinical study on effect of maternal anaemia on maternal and fetal outcome was conducted on 314 for a period of 1 year. Out of 314 patients, majority of women that is 251 patients (79.9%) were in moderate category of anaemia, 39 patients (12.4%) in mild category and only 24 patients (7.6%) in severe category. (Table :1) The mean haemoglobin level in present study was 8.65 gm/dl. Majority of patients belongs to 21-30 years i.e 76.3%. The mean age group in present study 23.49 yrs. Majority of women belongs to upper lower class around 48.7%, and lower middle were 42% according to Kuppuswamy classification. The severity of anaemia was associated with low socioeconomic status i.e. 41.7% patients of severe anaemia belongs to lower group. There was statistical significance between socioeconomic group and severity of anaemia.

Out of 314 patients, 200 cases (63.7%) were multigravida and 114 cases (36.3) were primigravida women. So, it was obvious that as the parity increased, the prevalence of anemia also increased. The association of anaemia with parity was found to be statistically significant (p=0.01). The mean gestational age of patients in present study was 37.52 weeks. 108 (34.4%) anaemic mothers had PPH out of 314. 83.3% patients with severe anaemia had PPH, this proved that

			Category			Total
			10-10.9	7-9.9	<7	
PPH						
	Yes	Count	1	87	20	108
		% within category	2.6%	34.7%	83.3%	34.4%
	No	Count	38	164	4	206
		% within category	97.4%	65.3%	16.7%	65.6%
Total		Count	39	251	24	314

Table-2: Incidence of PPH according to severity of anaemia

		10-10.9	7-9.9	<7	Total
		Category			**Total**
Yes	Count	2	59	15	76
	% within category	5.1%	23.5%	62.5%	24.2%
No	Count	37	192	9	238
	% within category	94.9%	76.5%	37.5%	75.8%
Total	Count	39	251	24	314

Table-3: Incidence of puerperal sepsis according to severity of anaemia

			10-10.9	7-9.9	<7	Total
			Category			**Total**
Failure of lactation						
	Yes	Count	2	67	9	78
		% within category	5.1%	26.7%	37.5%	24.8%
	No	Count	37	184	15	236
		% within category	94.9%	73.3%	62.5%	75.2%
Total		Count	39	251	24	314
Chi square=10.639 p value=0.005						

Table-4: Association of failure of lactation and severity of anaemia

			10-10.9	7-9.9	<7	Total
			Category			**Total**
Subinvolution						
	Yes	Count	2	58	12	72
		% within category	5.1%	23.1%	50.0%	22.9%
	No	Count	37	193	12	242
		% within category	94.9%	76.9%	50.0%	77.1%
Total		Count	39	251	24	314
Chi square =16.95 p value=0.005						

Table-5: Association of Subinvolution of Uterus and severity of anaemia

chances of PPH increases with increase in severity of anaemia which was highly significant. (Table :2)

62.5% severely anaemic patients had puerperal sepsis. There was significant association between severity of anaemia and development of puerperal sepsis. (Table 3)

In present study, out of 314 patients 24.85% had lactation failure. There was significant association of severity of anemia with lactation failure as shown below. (Table 4)

Our study showed severe anaemia was associated with subinvolution of uterus in 50 % of patients which was statistically significant (p=0.001). (Table 5)

DISCUSSION

In India, it is not uncommon to see patients with severe anaemia late in pregnancy with no prior antenatal visits especially in low socioeconomic settings and the same was evident from the present study. So, this clinical study to know the effects of maternal anaemia on mother outcome was done. Mean age of patients in our study was 23.4 years. This was similar to studies done by Sareen et al,[12] Pitchaiprest et al,[13] Bhaktiar et al,[14] and Sangeeta et al.[15] It was evident from the current study that there was no significant association between severity of anaemia and age of the women. Similarly, Lokare et al[16] and Rai N et al[17] also observed that difference was not statistically significant. Various studies have reported that maximum prevalence of anaemia was in the reproductive age group specially 21-30 years. In our study, the association of anaemia with various socioeconomic classes was found to be statistically highly significant (p=0.000). Poor socioeconomic status was found 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 Lokhare et al,[16] Arlappa et al,[18] Bentley et al. [19]

In current study, 63.7% women were multigravida and 36.3% were primigravida. In study by Shyama et al[20], 41.7% women were primigravida which was similar to present study. The prevalence of anaemia was also higher (90.2%) among multiparous women than 71.6% and 64.28% in primiparous and nulliparous respectively. In another study by Kefiyalew et al,[21] majority of pregnant women (80.2%) were multigravida. So, the present study revealed that anaemia was significantly more common in multigravida women than primigravida which was in concordance with the other studies.

In current study, maximum number of patients 251 (79.9%) were moderately anemic, whereas 39 (12.4%) had mild anaemia and only 24 (7.6%) had severe anaemia, this was similar to study by Viveki et al [22] and Agarwal et al.[23] The District Level Household Survey (1998-99) showed that

pregnant women were not being screened for anaemia and given appropriate therapy. Most women in poorly performing states did not come for ANC check-up and who came for the check-up did not get iron- folic acid tablets (IFA) throughout pregnancy. Even with strong antenatal programmes and iron folic acid supplementation for nearly 20 years, there is no appreciable decline in anaemia in India.

Postpartum haemorrhage (PPH) is recognized as one of the leading cause of maternal mortality worldwide. In present study PPH was present in 108 (34.4%) women. This was similar to study by Rohilla et al.[8] PPH was significantly associated with the varying degree of severity of anaemia. Frass in her observational studies explained the relationship between PPH and severe anaemia accounting for about 90%.[24] Kavle found that blood loss at delivery was slightly elevated in mild anaemic women as compared to non-anaemic women. He also observed strong association between the severity of anaemia with blood loss at delivery and in the post-partum period .[25]In current study, 76(24.2%) women had puerperal sepsis. In a study by Tusimin et al,[26] incidence of puerperal sepsis was 2.5%. Jaleel and Khan observed a high frequency of caesarean section or episiotomy wound infection in severely anaemic pregnant women as compared with non-anaemic pregnant women.[27] Rukuni et al had showed that anaemic mothers were more susceptible to postpartum infection and sepsis.[28] These results were similar to our findings in which the association of severity of anaemia with sepsis was statistically significant. Only 1 patient had DVT in current study which was not significant. No studies were available to compare the results of present study.78 (24.8%) women failed to lactate and 72 (22.9%) patients had subinvolution out of 314 patients. This was similar to study by Henley et al,[29] Mathur et al,[30] but study by Feleke et al[31] shows it to be as high as 43%.

CONCLUSION

In the light of the above observations, we inferred that prevalence of anaemia in pregnant women was found to be high specially among multiparous women of reproductive age group (21-30 years) and those belonging to low socio economic status. Moderate (Hb = 7-9.9gm/dl) and severe (<7 gm/dl) anaemia in third trimester of pregnancy is an indicator of poor perinatal outcome in terms of both mother .Timely identification of women with severe anemia and associated maternal complications during intrapartum and post partum period like congestive cardiac failure, postpartum hemorrhage, puerperal sepsis, failure of lactation and subinvolution can help in reducing maternal morbidity and mortality.

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