

Original research article

Antepartum and Intrapartum Complications in Anemic and Non-Anemic Women

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Abstract

Background: Anemia of varying severity in pregnancy has long been associated with fetomaternal complications when compared to non-anemic pregnant women worldwide. Complications can be in the antepartum, intrapartum or postpartum period along with its long-term impact on the maternal and fetal health.

Material and Methods: This was an observational study done in the department of Obs.& Gynae in our hospital from September 2019 - September 2021 on 276 anemic women with varying severity of anemia and 200 non-anemic women. Severity of anemia and its association with fetomaternal complications in the antepartum and intrapartum period and its comparison to the non-anemic group was the major focus of this study.

Results: A total of 476 pregnant women were included in this analysis of which 276 women were anemic of varying severity viz. mild anemia 75(27.17%), moderate anemia 145(52.53%), severe 40(14.49%) and very severe 16(5.79%) while 200 women were non anemic. Antepartum and intrapartum maternal complications were more in anemic group and more so in patients with severe anemia. Though fetal complications in the antepartum and intrapartum period were more in anemic group as compared to non-anemic group, the overall adverse impact on the fetus was quite less even in the group of severe anemia patients.

Conclusion: Anemia in pregnancy is strongly associated with varying degree of fetomaternal complications depending upon the severity of anemia and certainly is a major cause of fetal and maternal morbidity and mortality in the developing countries. Strengthening the health care system with timely provision for prevention, diagnosis and treatment of anemia can markedly decrease the disease burden and hence avoid fetomaternal complications related to it.

Keywords: Anemia, antepartum, intrapartum, fetomaternal complications

Introduction

India has one of the highest prevalence of anemia in pregnant women between 15 – 49 years of age and as per NFHS-5(National Family Health Survey) 2019-21 in pregnant women between 15 – 49 years, prevalence of anemia (Hb < 11%) is 52.2% which is higher than NFHS-4 (2015-2016) that is 50.4%.

According to World Health Organization (WHO), prevalence of > 5% or higher is a significant public health problem. Prevalence of anemia \geq 40% in a population is classified as a severe public health problem¹.

Anemia as an indirect cause of maternal mortality and accounts for the maximum number of cases and as a direct cause of 25% maternal deaths²⁻⁵. Anemia in pregnancy is reported to have adverse maternal and fetal and perinatal outcome and increased risk of maternal and perinatal mortality^{2,5}. An increasing incidence of preterm labor, hypertension, FGR (fetal growth restriction), IUD (intrauterine death) in association with anemia has also been observed⁶⁻⁹.

Materials and Methods:

This was an observational prospective study conducted between September 2019-September 2021. A sample size of 476 pregnant women was taken of which 276 were anemic and 200 were non anemic. All pregnant patients visiting OPD and labor room were included in the study while pregnant patients with other medical or obstetrical complications were excluded from this study. A detailed history of patients was taken. General and systemic examination was performed, routine blood investigations and special investigation like ultrasound (USG) done to assess the fetomaternal complications associated with anemia. Diagnosis of anemia was made on the basis of clinical assessment and confirmed by hemoglobin (Hb%) level and patients were categorized into 4 groups of mild (Hb 10- 10.9 gm%), moderate (Hb 9.9- 7.0gm%), severe (Hb 6.9- 4gm%) and very severe (Hb < 4 gm%) anemia on the basis of Indian Council of Medical Research (ICMR) guidelines.

Results:

A total of 276 anemic and 200 non anemic women were selected for the study.

Table 1: Shows distribution of anemic patients according to severity of anemia:

Mild		Moderate		Severe		Very Severe	
No.	%	No.	%	No.	%	No.	%
75	27.17	145	52.53	40	14.49	16	5.79

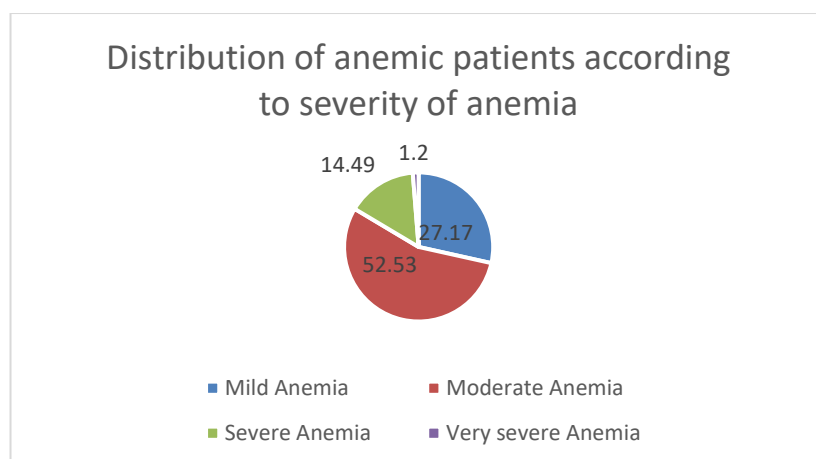


Figure 1: shows percentage distribution of anemic women according to severity of anemia

Out of 276 anemic women maximum number of patients had moderate anemia 145(52.53%) and very severe anemia cases were least that is 16(5.79%).

Table 2: shows antepartum maternal complications in anemic and non-anemic women

Complication	Anemic								Total Anemic (276)		Total Non-Anemic (200)	
	Mild (75)		Moderate (145)		Severe (40)		Very Severe (16)					
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Abortion	0	0	0	0	10	25	8	50	18	6.5	0	0
Preterm Labor	25	33.33	50	34.48	28	70	14	87.5	117	42.39	50	25
PROM	10	13.33	25	17.24	21	52.5	12	75	68	24.63	25	12.5
Pre Eclampsia	0	0	0	0	21	52.5	9	56.25	30	10.86	0	0
CHF	0	0	0	0	25	62.5	10	62.5	35	12.68	0	0
APH	0	0	1	0.68	5	12.5	5	31.25	11	3.98	0	0
Infection	30	40	85	58.62	25	62.5	12	75	77	55.07	50	25

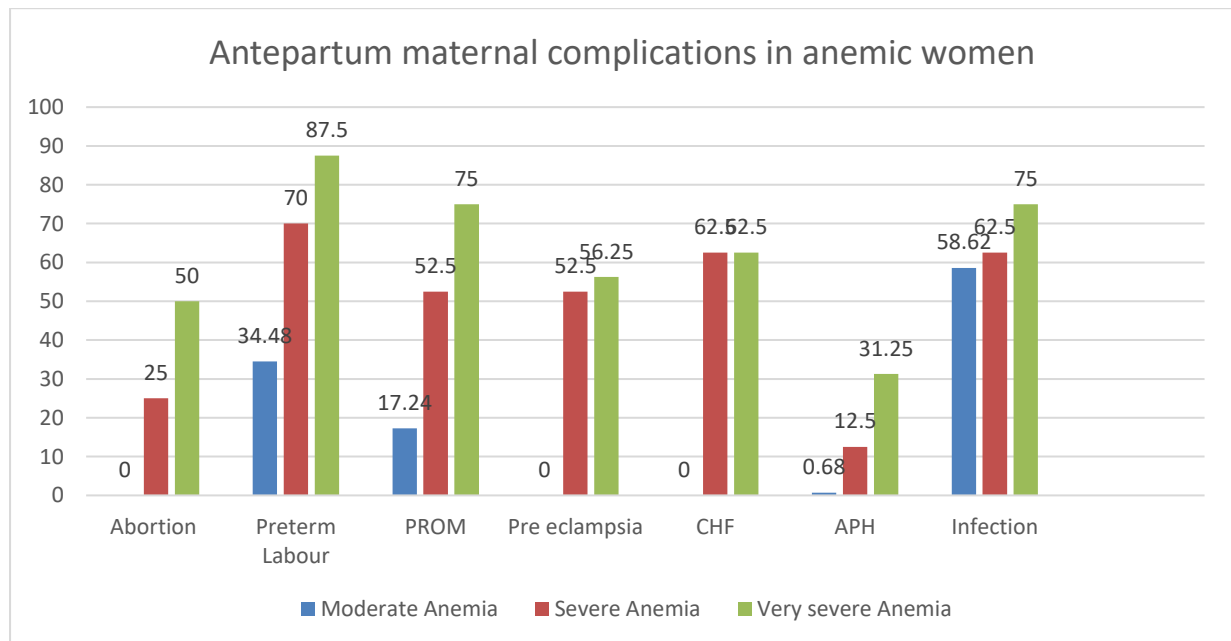


Figure 2: shows antepartum maternal complications in anemic women

*PROM: premature rupture of membranes
 CHF: Congestive heart failure
 APH: Antepartum haemorrhage

All the complications were more common in the anemic group than in non-anemic group and complications were much higher in patients with severe to very severe anemia. 70- 87.5% and 52.5-75% severe anemia patients had preterm labor and premature rupture of membranes (PROM) respectively and rate of infection was also quite high in patients with severe anemia (62.5 –75%). Outcome in mild anemia cases was almost similar to non-anemic group. There were no risk of abortion, preeclampsia or antepartum hemorrhage (APH) in the non-anemic

group. CHF (congestive heart failure) was strongly associated with both severe and very severe anemia (62.5%) while none in non-anemic women.

Table 3: shows Intrapartum maternal complications in anemic and non anemic women

Complication	Anemic								Total Anemic N=(276)		Non Anemic N=200	
	Mild N=(75)		Moderate N=(145)		Severe N=(40)		Very Severe N=(16)		No.	%	No.	%
	No.	%	No.	%	No.	%	No.	%				
Uterine Inertia	9	12	25	17.2	13	32.5	6	37.5	53	19.2	25	12.5
Dysfunctional Labor	15	20	45	31.03	19	47.5	9	56.25	88	31.88	20	10
CHF	0	0	5	3.44	26	65	11	68.7	42	15.21	0	0
Instrumental Delivery	10	13.3	20	13.79	15	37.5	9	56.25	54	19.56	26	13
Shock	0	0	0	0	3	7.5	6	37.5	9	3.26	0	0

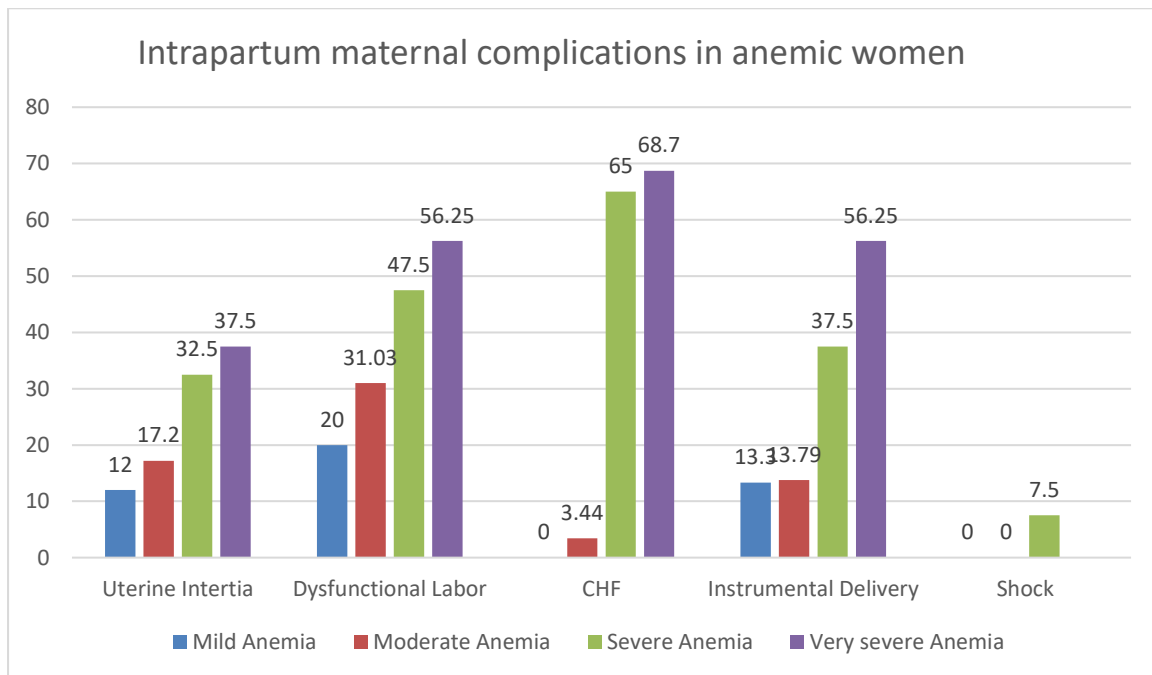


Figure 3: shows Intrapartum maternal complications in anemic women

Uterine inertia risk is high in patients with severe anemia (32.5%) whereas patients with mild anemia 9(12%) and non-anemic 25(12.5%) patients has no difference in relation to uterine inertia complications.

Around 47.5% of severe anemia patients and 56.25% of very severe anemia patients were found to be have dysfunctional labor whereas in the non-anemic group only 10% patients encountered dysfunctional labor.

CHF as seen in antepartum period (62.5%) is also strongly associated with severe anemia in the intrapartum period (65-68.7%) and none were seen in non-anemic patients.

Incidence of instrumental delivery due to dysfunctional labor or maternal exhaustion or to cut short second stage of labor results in a higher number of them in anemic group (19.56%) as compared to

non anemic group (13%) though the difference was not large when seen collectively but definitely high in severe (37.5%) to very severe (56.25%) anemia.

None of the patients in non-anemic group developed shock and the incidence of it was low in the anemic (7.5-37.5%) group as well probably due to better critical care facilities and timely interventions.

Table 4: shows Fetal complications in antepartum and intrapartum period in anemic and non-anemic women

Complication	Anemic								Total (276)	Anemic	Non Anemic N=(200)	
	Mild N=(75)		Moderate N=(145)		Severe N= (40)		Very Severe N=(16)					
	No.	%	No.	%	No.	%	No.	%				
FGR	10	13.33	30	20.68	10	25	8	50	58	21.01%	25	12.5
Prematurity	20	26.66	35	24.13	20	50.0	10	62.5	85	30.79	37	18.5
Still birth	6	5.33	10	6.89	9	22.5	6	37.5	29	10.5	9	5
IUD	4	5.33	14	9.65	8	20	4	25	28	10.86	11	5.5
Birth Asphyxia	10	13.33	22	15.17	14	35	7	43.75	53	19.2	10	5
Meconium Aspiration	10	13.33	25	17.24	10	25	6	37.5	51	18.47	25	12.5
Congenital Anomaly	0	0	0	0	0	0	0	0	0	0	0	0

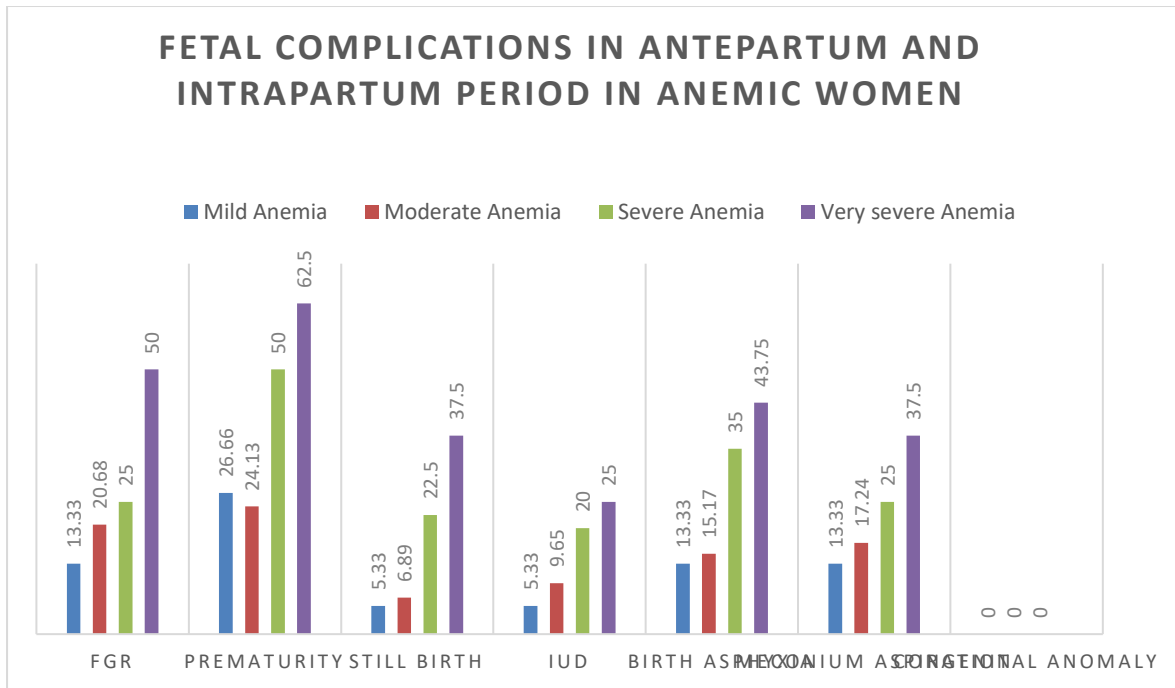


Figure 4: shows Fetal complications in antepartum and intrapartum period in anemic women

In the anemic group FGR (21.01%), Prematurity (30.79%), Stillbirth (10.5%), IUD (intrauterine death) (10.86%), birth asphyxia (19.2%) and Meconium aspiration (18.47%) were more as compared to the non-anemic group though the difference were not very significant. All fetal complications were in direct relation to the severity of anemia except congenital anomalies where no relation was found in both anemic and non-anemic groups.

Discussion:

Maternal anemia is considered a risk factor for poor maternal and fetal outcome in terms of complications associated with anemia in the antepartum, intrapartum as well as the postpartum period.

This study highlights the complications encountered in the antenatal and intrapartum period of pregnancy and its overall impact on the mother and the fetus.

Table 5: shows comparison of our study findings with those found in similar studies

	Mild Anemia (10- 10.9 gm%)	Moderate Anemia (9.9-7gm%)	Severe Anemia (6.9- 4 gm%)	Very Severe Anemia (<4 gm%)
Our study	27.17	52.53	14.49	5.79
Marti-Carvajal ¹⁰ (2002)	23.0	38.2	1.8	NA
Thangeela T & Vijaylakshmi ¹¹ (1994)	23	38.2	9.2	NA
NHFS (2015-2016)	40	12	01	NA

As seen from our study that cases with moderate anemia is highest as is also seen in other studies except NHFS 4 (2015-2016) India data where over all mild anemia is the commonest. No data was however available for cases with severe anemia.

In our study the risk of spontaneous abortion was only 6.5% in anemic women and none in non-anemic women although the overall risk was high in the patients with severe and very severe anemia group ranging from 25 – 50%.

Naushaba R et al ⁷, concluded that in the anemic group preterm labor and delivery risk was as high as 56.25% as compared to the non-anemic group. Our study also shows a 42.39% increased risk in the anemic group as compared to 25% in the non – anemic group.

Preterm labor was as high as 70 – 87.5% in the group with severe anemia.

Our study results were comparable to study done by Ghimire et al ⁸ as well in which it was concluded that there was an increased risk of complications including hypertension and preterm labor in anemic group.

In a study done by Jain P et al⁹, a significant correlation was found between anemia and development of preeclampsia, eclampsia and preterm (p<0.005).

Risk of CHF was higher in anemic group (12.68%) in this study as compared to none in non-anemic women. Similar results were obtained in study conducted by Kaul I et al ¹² where anemic women had 1.74% increased risk as compared to none in non-anemic group

Outcome	Our study		Kaul I et al ¹²	
	Anemic	Non-Anemic	Anemic	Non-Anemic
Preterm Labor	117(42.39%)	50(25%)	83(14.46%)	4(2.07%)
Fetal Growth Restriction (FGR)	58(21.01%)	25(12.5%)	48(8.38%)	3(1.56%)
Intrauterine fetal death (IUFD)	28(10.86%)	11(5.5%)	55(9.6%)	2(1.04%)
Preeclampsia	30(10.86%)	00(0%)	54(9.41%)	2(1.04%)
CHF	35(12.68%)	00(0%)	10(1.74%)	0(0%)

Complications like Antepartum hemorrhage (APH) is slightly higher 11(3.98%) as compared to none in non-anemic women probably due to hypoxia and preeclampsia associated with anemia and there is also an overall increased infection risk in anemic patients 77(55.07%) as compared to non-anemic 50(25%) which comprises of urinary tract infection, respiratory tract infection etc.

Dysfunctional labor was seen in 88(31.88%) anemic women as compared to 20(10%) in non-anemic women and so is a higher chance of development of uterine inertia in anemic 53(19.2%) than in non-anemic 25(12.5%) women.

Instrumental delivery whether by forceps or ventouse is higher in anemic 54(19.56%) in comparison to non-anemic 26(13%) women and similar results are also seen in other studies

Instrumental Delivery	Anemic	Non-anemic
Our study	19.56%	13%
Anamika Awasthi ¹³	6.5%	2%
Ogu Rosemary N et al ¹⁴	0.6%	0%

Fetal complications like FGR 58(21.01%) and IUFD 28(10.86%) were higher than in non-anemic women 25(12.5%) and 11(5.5%) respectively. Similar results were also seen in other studies^{9,12}.

In our study we found preterm birth or prematurity 85(30.79%), Meconium aspiration 51(18.47%), stillbirth 29(10.5%) as compared to 37(18.5%),25(12.5%),9(5%) respectively in non-anemic women. Similar results were seen in other studies^{12,15,16}.

Birth asphyxia and hence low apgar score was higher in anemic women 53(19.2%) as compared to non-anemic women 10(5%) in our study. Similar results were seen in other studies as well^{11,12,17}.

Conclusion:

Despite the fact that India was the first developing country to implement a national prevention program for anemia it still continues to be a major preventable health hazard affecting not just the mother but also increases considerable fetal, perinatal and neonatal mortality.

All maternal and fetal complications in the antepartum and intrapartum period are more common in anemic women than in the non-anemic group and as severity of anemia increases so does the rate of maternal and fetal affection.

Despite a number of fetal complications that are associated with anemia, a large number of fetuses have a relatively good outcome due to the tendency of fetal parasitism on the mother though these babies may be born with low cord blood Hb and might require iron supplementation in the neonatal period.

Conflict of Interest: Nil

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