

Prevalence of severe anemia and its fetal outcome in women who come in labour in a tertiary care hospital-A prospective study

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Abstract

Background: The prevalence of anaemia in pregnant women is high due to illiteracy, ignorance, low socio economic status, lack of proper antenatal care, close birth spacing, multiparity. **Aim & Objectives:** To study the incidence of severe anemia with $HB \leq 7\text{gm\%}$ in women in labor

- To study the maternal outcome of severe anemia in labor
- To study the fetal outcome of pregnancy with severe anemia in labor

Methodology: It was a prospective study. The study was conducted at Kurnool Medical College, Kurnool during the period of November 2017 to October 2018. All pregnant women in labor with hemoglobin $\leq 7\text{gm\%}$. **Results:** 10331 study subjects coming to delivery in labour room are taken. 7990 of cases (77.49%) are anemic. Among anaemic cases, severe anaemia (4-7g %) and very severe anaemia ($<4\text{g}$ %) were only taken. 364 cases were severely anemic. Among 364 cases, 22.8 % (83) cases had very severe anaemia and 77.2 % (281) had severe anaemia. Majority of study subjects belonged to age group of 20-24 years –60.99% of cases. 64.84 % of cases were belonged to low socio economic status. 60.44 % of cases were multigravida indicating the prevalence of anaemia in multigravida. 66.48 % of cases had birth spacing of $<2\text{years}$ where as only 33.52 % had birth spacing $\geq 2\text{years}$. 73.35 % of cases are unbooked. 10.16%, 3.3%, 28.57%, 31.59% of cases had weakness/fatigue, dyspnoea/palpitations, pedal edema and Preeclampsia respectively. 75.27% of cases had normal vaginal deliveries. 7.42% of cases had assisted vaginal deliveries (instrumental deliveries). 24.73% of cases underwent LSCS. The most common indication being Previous LSCS. 43.96 % of cases had preterm births. 46.43% of cases had term births. 9.62 % of cases had post term delivery. 2.47 % of cases had CCF. 0.59 % of cases had retained placenta. 8.52 % of cases had PPH. 7.69 % of cases as against had puerperal pyrexia. 3.3 % of cases had puerperal sepsis. 8.52 % of cases had sub-involution. 10.99 % of cases had lactation failure. 1.92 % of cases had episiotomy wound gaping. 4.12 % of cases had post LSCS wound gaping. 39.56 % of cases had low birth weight babies. 20.05% among cases had IUGR births. 15.66% neonates were admitted in the NICU. The neonatal morbidity was 16.21 % among cases. The Perinatal mortality was 2.2 % among cases. The average number of blood transfusion is 3 per subject among very severe anaemia group and 1 per subject in severe anaemia subjects. The maternal morbidity among cases was 31.32 %. There were 0.55% maternal deaths in the study subjects in the current study. 7.69% of the cases had ICU admission 7.14% of the cases contributed to near miss cases. **Conclusion:** It is recommended that good antenatal care be available, accessible and affordable to all pregnant women through partnership between government and nongovernmental organizations creating awareness through public health programmes and fortification of food which will improve the nutritional status of women.

Keywords: Anemia, Neonatal Morbidity, Maternal Deaths, Preterm birth, multigravida, Wound gaping.

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Introduction

Anemia is a major public health problem throughout the world. It is the most common hematological abnormality diagnosed in pregnancy. Its Prevalence in India is about 57.9% and may increase to 80% during pregnancy[1]. In India, anemia is the second most common cause of maternal mortality. It directly or indirectly contributes to a significant proportion (about 40%) of maternal Deaths[1]. Women in the childbearing age group, adolescents, and young children are most commonly affected. Among pregnant women at least half of the anemia cases are due to iron deficiency which more often than not to malnutrition. Infections can also contribute to iron deficiency, causing chronic blood loss such as parasitic infestation with hookworm. Viral and bacterial infections may interfere with food intake, absorption, and storage of many nutrients including iron. It antedates the conception, often aggravated

by pregnancy and delivery. It is most commonly due to iron deficiency and occasionally by other complex mechanisms[2]. In pregnant women with severe anemia, there is an increased incidence of antepartum hemorrhage, preterm labor, sepsis, increased susceptibility to infection, and asymptomatic bacteriuria. During labor, there is an increased incidence of uterine inertia, maternal exhaustion, PPH, CCF, and maternal mortality. During puerperium, there is increased incidence of puerperal sepsis, thromboembolic events, delayed wound healing, wound gaping, failure of lactation[3]. Fetal adverse effects will be increased risk of prematurity, increased incidence of LBW, IUGR, low APGAR score at birth, stillbirths, poor perinatal outcome and perinatal mortality[3]. As anemia is one of the leading causes responsible for maternal and perinatal morbidity and mortality, one of the primary aims of antenatal care is to prevent anemia during pregnancy to ensure safety during labor, puerperium, and future health. In developing countries like India, as there is an increased incidence of low socioeconomic status, multiparity, improper antenatal care, less interpregnancy interval, it leads to a high prevalence of anemia in India. This study helps to evaluate maternal and fetal outcome in women with severe and very severe anemia in labor.

As ours is a tertiary care hospital we receive a number of cases of

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severe anemia with its complications from 2 states, 5 districts (Anantapur, Kadapa, Mahabubnagar, Jogulamba, Gadwal, Kurnool).

Maximum maternal morbidity and mortality in our hospital due to unbooked women with anemia and its complications in labour. There is no time for the correction of anemia and inevitably mother succumbs to death.

Aims and objectives

- To study the incidence of severe anemia with $HB \leq 7\text{ gm\%}$ in women in labor
- To study the maternal outcome of severe anemia in labor
- To study the fetal outcome of pregnancy with severe anemia in labor

Materials and methods

Source of data

Pregnant women in labor with hemoglobin $\leq 7\text{ gm\%}$ admitted in the maternal block, government general hospital, Kurnool.

Method of collection of data

Sample

All pregnant women in labor with hemoglobin $\leq 7\text{ gm\%}$ Study

Design

Prospective study

Duration of study

1 year, November 2017 to October 2018

Inclusion criteria

- All pregnant women in labor of any parity with hemoglobin $\leq 7\text{ gm\%}$

Exclusion criteria

- Pregnant women with mild to moderate anemia. (hemoglobin $> 7\text{ gm\%}$)
- Pregnant women with severe anemia before conception.
- Pregnant women with severe anemia following severe bleeding due to antepartum hemorrhage.

Procedure of study

The pregnant women with $Hb\% < 7\text{ gm\%}$ coming in labor will be included as cases. They are further categorized into severe anemia with Hb between 4-7 gm% and very severe anemia $< 4\text{ gm\%}$. The course of study is explained and informed about the procedure and informed consent taken.

All the selected subjects will be subjected to following investigations

- Haematological : Complete hemogram, Serum proteins & Blood grouping and typing, peripheral smear.
- Urine : Albumin, Globulin, Microscopy
- HIV, HCV, HbsAg,
- Obstetric term ultrasonography
- ECG
- 2DECHO

The severity of anaemia is assessed. The maternal and fetal outcome is studied. Present pregnancy details studied are age, parity, SES, birth spacing, booking status, any associated medical disorder. Gestational age at delivery, mode of delivery, any operative interference if required. Intrapartum complications like CCF, Retained placenta, PPH are studied.

Puerperal complications like puerperal pyrexia, puerperal sepsis, subinvolution, lactational failure, episiotomy wound gaping, LSCS wound gaping. Fetal outcome is also studied as number of live births, still births, IUGR, NICU admission, birth weight. Total outcome is judged by neonatal examination at birth.

The maternal and fetal morbidity and mortality is assessed.

Results

Out of 10311 cases admitted in the labour room within one year, 364 cases had severe anemia. In them 281 cases were severely anemic, 83 cases had very severe anaemia and they were studied to find out fetal/maternal complications. 7626 cases had mild-moderate anemia, 2321 had no anemia.

The study subjects were divided into 2 groups.

- 364 cases of severe and very severe anaemia

Table -1 Distribution of cases based on degree of anemia in Pregnancy

S.NO	Degree of anaemia	Number of cases	Percentage (%)
1	No Anaemia	2321	22.51
2	Mild-moderate anaemia	7626	73.96
3	Severe Anaemia	281	2.73
4	Very Severe Anaemia	83	0.8
	Total	10311	100

In our study majority of cases belongs to mild-moderate anaemia 73.96% (7626 out of 10331), and 22.51% (2321 out of 10331), 2.73% (281 out of 10331), 0.8% (83 out of 10331) had no anaemia, severe anaemia, very severe anaemia.

Table 2: Distribution of cases according to severity of anaemia

S.No	Grade of Anaemia	No of cases	Percentage (%)
1	Severe	281	77.2
2	Very severe	83	22.8

Among 364 case subjects, 281 (77.2%) were severely anaemic and 83 (22.8%) were very severely anaemic.

Table - 3: Age distribution among cases of severe anaemia

S. No	Age in years	Cases N (%)	Very severe anaemia N (%)	Severe anaemia N (%)
1	< 20	22 (6.04)	7 (8.43)	15 (5.34)
2	20-24	222 (60.99)	55 (66.26)	167 (59.43)
3	25-29	91 (25)	14 (16.88)	77 (27.4)
4	≥ 30	29 (7.97)	7 (8.43)	22 (7.83)
	Total	364 (100)	83 (100)	281 (100)

In this study, majority of the cases belonged to 20-24 years age group.

Majority i.e., 66.26% (55 out of 83) of very severely anaemic cases and 59.43% (167 out of 281) of severely anaemic cases belonged to 20-24 years agegroup.

Table – 4: Socio-economic status (SES) in cases of severe anaemia

S.No	SES	Cases N (%)	Very severeanaemia N (%)	Severe anaemia N (%)
1	Lower	236 (64.84)	67 (80.72)	169 (60.14)
2	Middle	128 (35.16)	16 (19.28)	112 (39.86)
	Total	364(100)	83(100)	281(100)

80.72% (67 out of 83) of very severely anaemic cases and 60.14% (169 out of 281) of severely anaemic cases belonged to low socioeconomic status.

Majority of cases i.e., 236 out of 364 (64.84%) belonged to low socio Economic Status.

Table – 5: Distribution of cases according to parity in cases of severeanaemia

S.No	Parity	CasesN (%)	Very severeanaemia N (%)	Severe anaemia N (%)
1	Primi	144 (39.56)	32 (38.55)	112 (39.86)
2	Multi	220(60.44)	51 (61.45)	169 (60.14)
3	Total	364 (100)	83 (100)	281 (100)

61.45% (51 out of 83) of very severely anaemic cases and 60.14% (169 out Of 281) of severely anaemic cases were multigravida.

Majority of cases i.e., 220 out of 364(60.44%) were multigravida.

Table – 6: Birth spacing in cases of severe anaemia

S. No	Birth spacingin years	CasesN(%)	Very severecease N (%)	Severe case N (%)
1	< 2 years	242 (66.48)	51 (61.45)	191 (67.97)
2	≥ 2 years	122 (33.52)	32 (38.55)	90 (32.03)
	Total	364 (100)	83 (100)	281 (100)

61.45% (51 out of 83) of very severely anaemic cases and 67.97% (191 outof 281) of severely anaemic cases had birth spacing of < 2 years.

Majority of cases had birth spacing <2 years.

Table –7: Booking status according to severity of anaemia

S. No	Bookingstatus	verallcases N (%)	Very severe anaemia N (%)	Severe anaemia N (%)
1	Booked	97 (26.65)	9(10.84)	88(31.32)
2	Un booked	267 (73.35)	74(89.16)	193(68.68)
3	Total	364 (100)	83 (100)	281 (100)

Majority of the cases i.e., 267 out of 364 (73.35%) were unbooked. 89.16% (74 out of 83) of very severely anaemic cases and 68.68% (193 outof 281) of severely anaemic cases were unbooked.

Table – 8: Clinical features in cases of severe anaemia

S. No	Clinicalfeatures	CasesN (%)	Very severeanaemia N (%)	Severe anaemia N (%)
1	Weakness/fatigue	37 (10.16)	13(15.66)	24(8.54)
2	Dyspnoea/palpitations	12 (3.3)	8(9.64)	4(1.42)
3	Pedal edema	104 (28.57)	58(69.88)	46(16.37)

10.16% (37 out of 364); 3.3% (12 out of 364); 28.57% (104 out of 364); of cases had weakness/fatigue, dyspnoea/palpitations, pedal edema respectively. In our study, the most common symptoms of anaemia was weakness/easy fatigability 15.66% (13 out of 83), palpitations/dyspnoea 9.64%(8 out of 83), pedal edema 69.88% (58 out of 83), were seen in the cases of very severe anaemia and 8.54% (24 out of 281) , 1.42%(4 out of 281) 16.37% (46 out of 281) and 20.28% (57 out of 281) of cases of severe anaemia respectively.

Table-9: Associated complications in Cases of severe anaemia

S. No	Clinicalfeatures	CasesN (%)	Very severe anaemia N (%)	Severe anaemia N (%)
1	Preeclampsia	115 (31.59)	58(69.88)	57(20.28)
2	Twins	10(2.74)	4 (4.82)	6 (2.14)
3	PROM	35 (9.62)	16 (19.23)	29 (10.21)

31.59 % (115 out of 364), 2.74% (10 out of 364), 9.62 % (35 out of 364) caseshad Preeclampsia, Twins and PROM respectively.

Table-10: Distribution of cases according to Gestational age

S.NO	Gestational age (Weeks)	Cases N (%)	Very severe anaemia N (%)	Severe anaemia N (%)
1	24-28	23(6.32)	5(6.02)	18(6.41)
2	28-32	48(13.19)	10(12.04)	38(13.52)
3	32-37	89(24.45)	19(22.89)	70(24.91)
4	37-40	169(46.43)	35(42.17)	134(47.69)
5	40-42	20(5.49)	7(8.43)	13(4.63)
6	>42	15(4.12)	7(8.43)	8(2.85)

Most of the cases were belongs to the gestational age of 37-40weeks 46.43% (169 out of 364)

Most of the cases belongs to 37-40 weeks gestational age group, among these 42.17% (35 out of 83), 47.69% (134 out of 281) belongs to very severe anaemia and severe anaemia group respectively.

Table-11: Stage of labour in which cases have presented

S.NO	Stage of labour	Cases N (%)	Very severeanaemia N (%)	Severe anaemia N (%)
1	Latent Phase	160(43.96)	35(42.17)	125(44.48)
2	Active Phase	128(35.16)	28(33.73)	100(35.59)
3	2 nd Stage of labour	76(20.88)	20(24.1)	56(19.93)

Majority of cases presented in the latent phase of labour and were43.96% (160 out of 364).

Majority of cases presented in the latent phase of labour i.e. 43.96% (160 out of 364) among them very severe anaemia cases were 42.17% (35 out of 83), severe anaemia cases were 44.48% (125 out of 281)

Table-12: Complications during 1st Stage of labour

S.NO	Stage of labour	Cases N (%)	Very severe anaemia N (%)	Severe anaemia N (%)
1	Prolonged labour	61(16.76)	22(26.51)	39(13.88)
2	Precipitate labour	18(4.95)	8(9.64)	10(3.56)
3	Cardiac Failure	4(1.1)	3(3.61)	1(0.36)
4	PROM	35(9.62)	16(19.23)	19(6.76)

16.76% (61 out of 364) of cases had prolonged labour 4.95% (18 out of 364) of cases had Precipitate labour. 1.1% (4 out of 364) of cases had Cardiac Failure 9.62% (35 out of 364) of cases had PROM

26.51 % (22 out of 83) of very severely anaemia cases and 13.88% (39 out of 281) of severely anaemia cases had prolonged labour.

9.64 % (8 out of 83) of very severely anaemia cases and 3.56 % (10 out of 281) of severely anaemia cases had Precipitate labour.

3.61 % (3 out of 83) of very severely anaemic and 0.36% (1 out of 281) of severely anaemic cases had Cardiac Failure 9.23 % (16 out of 83) of very severely anaemia cases and 6.76% (19 out of 281) of severely anaemia cases had PROM

Table-13: Complications during 2nd Stage of labour

S.NO	Complications	Cases N (%)	Very severe anaemia N (%)	Severe anaemia N (%)
1	Maternal exhaustion	42(11.54)	18(21.69)	24(8.54)
2	Cardiac failure	3(0.82)	1(1.2)	2(0.71)
3	Obstructed labour	9(2.47)	4(4.82)	5(1.78)

11.54% (42 out of 364) of cases had maternal exhaustion 0.82% (3 out of 364) of cases had CCF 2.47% (9 out of 364) of cases had obstructed labour.

21.69 % (18 out of 83) of very severely anaemia cases and 8.54 % (24 out of 281) of severely anaemia cases had maternal exhaustion. 1.2 % (1 out of 83) of very severely anaemia cases and 0.71% (2 out of 281) of severely anaemia cases had CCF. 4.82 % (4 out of 83) of very severely anaemic and 1.78% (5 out of 281) of severely anaemic cases had obstructed labour.

Table-14: Complications during 3rd Stage of labour

S.NO	Complications	Cases N (%)	Very severe anaemia N (%)	Severe anaemia N (%)
1	Cardiac failure	2(0.55)	1(1.2)	1(0.36)
2	PPH	31(8.52)	15(18.07)	16(5.69)
3	Retained Placenta	2(0.55)	0	2(0.71)

2.47% (9 out of 364) of cases had CCF 8.52 % (31 out of 364) of cases had PPH. 0.59% (2 out of 364) of cases had retained placenta.

7.23 % (6 out of 83) of very severely anaemia cases and 1.07% (3 out of 281) of severely anaemia cases had CCF. Only two cases belonging to severe anaemia group had retained placenta. 18.93 % (15 out of 83) of very severely anaemic and 5.69% (5 out of 281) of severely anaemic cases had PPH

Table – 15: Distribution of cases as per mode of delivery

S.NO	Stage of labour	Cases	Very severe anaemia N (%)	Severe Anaemia N (%)
1	Spontaneous Vaginal	274(75.27)	62 (74.7)	211(75.09)
2	Assisted vaginal(Vacuum)	18(4.94)	3(3.61)	15(5.34)
3	Assisted vaginal(Forceps)	9(2.47)	0	9(3.2)
4	LSCS	90 (24.73)	21(25.3)	69(24.55)

75.27 % (274 out of 364) of cases had vaginal delivery, 4.94 % (18 out of 364) of cases had assisted vaginal delivery (vacuum), 2.47% (9 out of 364) of cases had Assisted vaginal (forceps) and 24.73% (90 out of 364) of cases had LSCS.

74.7% (62 out of 83) of very severely anaemic cases and 75.09% (211 out of 281) of severely anaemic cases had vaginal delivery. 3.61% (3 out of 83) of very severely anaemic cases and 8.54% (24 out of 281) of severely anaemic cases had instrumental deliveries.

25.3 % (21 out of 83) of very severe anaemia had caesarean delivery and 24.55% (69 out of 281) of severely anaemic group had caesarean delivery.

Table – 16: Indication for caesarean delivery among cases

S.NO	Indications	Cases N (%)
1	Fetal distress	6 (6.67)
2	CPD & CP	22 (24.44)
3	Breech	7 (7.78)
4	Previous LSCS	46 (51.11)
5	Obstructed Labour	9 (10)
	Total	90 (100)

Among LSCS, the most common indication was Previous LSCS 51.11 % (46 out of 90) LSCS cases.

Table-17: Blood loss in cases of severe anaemia

S. No	Blood loss(ml)	Cases N (%)	Very severe anaemia N (%)	Severe anaemia (%)
Vaginal				
1	300-500	253 (69.51)	46(55.42)	207 (73.67)
2	>500	21(5.77)	10(12.05)	11 (3.91)
LSCS				
1	500-1000	80 (21.98)	22 (26.51)	58(20.65)
2	>1000	10	5(6.02)	5(1.78)

Blood loss during vaginal delivery varies from 300-500 ml in 69.51% cases to > 500 ml in 5.77% cases. Blood loss during LSCS varies from 500-1000ml in 21.98% cases to >1000ml in 2.75% cases.

Blood loss during vaginal delivery varies from 300-500 ml in 55.42% Very Severe anaemia cases to > 500 ml in 12.05% Very severe anaemia cases and server anaemia cases varies from 300-500 ml blood loss in 73.67% cases to >500 ml blood loss in 3.91% cases. Blood loss during LSCS varies in **Very severe anaemia** cases from 500-1000ml in 26.51% cases to >1000ml in 6.02% cases. Blood loss during LSCS varies in **severe anaemia** cases from 500-1000ml in 20.65% cases to >1000ml in 1.78% cases.

Table – 18: Time of delivery in cases of severe anaemia

S.No	Time of delivery	Cases N (%)	Very severe anaemia N (%)	Severe anaemia N (%)
1	Preterm	160 (43.96)	50 (60.24)	110 (39.15)
2	Term	169 (46.43)	27 (32.53)	142 (50.53)
3	Post term	35 (9.62)	6 (7.23)	29 (10.32)

43.96 % (160 out of 364) of cases had preterm labour, 46.43% (169 out of 364) cases had term labour, 9.62 % (35 out of 364) of cases had post term labour

60.24% (50 out of 83) very severely anaemic cases and 39.15% (110 out of 281) of severely anaemic cases had preterm labour; 32.53% (27 out of 83) very severely anaemic cases and 50.53% (142 out of 281) of severely anaemic cases had term labour; 7.23% (6 out of 83) very severely anaemic cases and 10.32% (29 out of 281) of severely anaemic cases had post term labour.

Table-19: Timing of blood transfusion:

S.NO	Timing of blood transfusion	Cases
1	Intrapartum	198 (54.4)
2	Post partum/Post operatively	160 (43.97)
3	Intrapartum+ Post partum/Postoperatively	321 (88.19)

54.4% cases were blood transfused antenatally, 43.97% were post nately/post operatively transfused, 88.19% were transfused Antenatally+ Post nately/ Post operatively.

Table –20: Puerperal complications in cases of severe anaemia

S.No	Puerperal complications	Cases N (%)	Very severe anaemia N (%)	Severe anaemia N (%)
1	Puerperal pyrexia	28 (7.69)	7 (8.43)	21 (7.47)
2	Puerperal sepsis	12 (3.3)	5 (6.02)	7 (2.5)
3	Sub involution	31 (8.52)	15 (18.07)	16 (5.69)
4	Lactation failure	40 (10.99)	13 (15.66)	27 (9.61)
5	Episiotomy wound gaping	7 (1.92)	2 (2.41)	5 (1.78)
6	LSCS wound gaping	15 (4.12)	9 (10.83)	6 (2.14)

In cases, 7.69 % (28 out of 364) had puerperal pyrexia, 3.3 % (12 out of 364) had puerperal sepsis, and 8.52 % (31 out of 364) had sub involution. In cases, 4.5% (9 out of 200) had lactation failure, 8.5% (17 out of 200) had episiotomy wound gaping and 1% (2 out of 200) had caesarean section wound gaping

8.43% (7 out of 83) of very severely anaemic cases and 7.47% (21 out of 281) of severely anaemic cases had puerperal pyrexia.

6.02 % (5 out of 83) of very severely anaemic cases and 2.5 % (7 out of 281) of severely anaemic cases had puerperal sepsis.

18.07 % (15 out of 83) of very severely anaemic cases and 5.69 % (16 out of 281) of severely anaemic cases had sub involution.

15.66 % (13 out of 83) of very severely anaemic cases and 9.61 % (27 out of 281) of severely anaemic cases had lactational failure.

2.41% (2 out of 83) of very severely anaemic cases and 1.78% (5 out of 281) of severely anaemic cases had episiotomy wound gaping.

10.83% (9 out of 83) of very severely anaemic cases and 2.14% (6 out of 281) of severely anaemic cases had LSCS wound gaping.

Table – 21: Maternal Morbidity and Mortality among cases

S.No	Health status	Cases N (%)	Very severe Anaemia N (%)	Severe anaemia N (%)
1	Morbidity	114 (31.32)	37 (44.58)	77 (27.4)
2	Mortality	2 (0.55)	2 (2.41)	0 (0)

In our study over all maternal morbidity was 31.32% (114 out of 364) and maternal. Mortality Was 0.55% (2 out of 364).

The maternal morbidity varied from 44.58% (37 out of 83) in very severely anaemic group to 27.4 % (77 out of 283) in severely anaemic group.

The maternal mortality was 2.41% (2 out of 83) only in very severely anaemic group and no maternal deaths in the severely anaemic group

Table-22: Distribution of Newborns as per Gestational age

S.NO	Gestational age	Cases N (%)	Very severe anaemia N (%)	Severe anaemia N (%)
1	< 37 weeks	160	35	125
2	37-40 weeks	169	37	132
3	> 40 weeks	35	11	24

very severe anaemic mothers has delivered 35 out of 83 before 37 weeks, 37 out of 83 between 37-40 weeks, 11 out of 83 delivered >40 weeks of gestational age.

Severe anaemic mothers delivered 125 out of 281 before 37 weeks, 132 out of 281 between 37-40 weeks, 24 out of 281 >40 weeks of gestational age

160 out of 364 delivered <37 weeks, 169 out of 364 delivered between 37-40 weeks and 35 out of 364 were delivered > 40 weeks of gestational age

Table –23: Birth weight of neonates according to severity of anaemia among cases

S.No	Birth weight (gm)	Cases N (%)	Very severe anaemia N (%)	Severe anaemia N (%)
1	<1000	20 (5.5)	4 (4.82)	16 (5.69)
2	1000-1500	20 (5.5)	4 (4.82)	16 (5.69)
3	1500-2000	35 (9.62)	7 (8.43)	28 (9.96)
4	2000-2500	69 (18.96)	16 (19.28)	53 (18.86)
5	≥ 2500	220 (60.44)	35 (42.17)	185 (65.84)

In our study 60.44% babies weigh more than 2500grams, 5.5% babies weigh <1000grams, 9.52% babies weigh in between 1500-2000grams. very severe anaemic mother babies has weights 4.82% <1000Grams,4.82% babies weigh between 1000-1500grams,8.43% babies weigh between 1500- 2000grams,19.28%babies weigh between 2000-2500grams,42.17% babies weigh >2500grams.

Table –24: Perinatal deaths according to severity of anaemia in cases

S. No	Time of death	CasesN (%)	Very severe anaemia N (%)	Severe anaemiaN (%)
1	IUD	12(3.3)	8(9.64)	4(1.4)
2	FSB	4(1.1)	2(2.41)	2(0.71)
3	Neonatal death	2(0.55)	2(2.41)	0

Table-25: Distribution of Perinatal deaths.

S. No	Aetiology	IUD (%)	Still birth(%)	NND (%)
1	Severe IUGR	10(2.75)	0	2(0.55)
2	Neonatal sepsis	0	1(0.27)	4(1.1)
3	Severe birthaplasia	0	1(0.27)	2(0.55)
4	Congenital abnormalities	2(0.55)	0	0

In this study most common perinatal death cause was severe IUGR for IUD 2.75%, for Still birth 0%, for NND 0.55%. Most common cause for neonatal mortality in IUD's was Severe IUGR 2.75%, in Still birth was neonatal sepsis 0.27%, in NND was neonatal sepsis 1.1%.

Table – 26: Neonatal Morbidity and Mortality

S.No	Health status	CasesN (%)	Very severe anaemiaN (%)	Severe anaemiaN (%)
1	Morbidity	59 (16.21)	20 (24.1)	39 (13.88)
2	Mortality	8 (2.2)	6(7.23)	2(0.71)

The overall neonatal morbidity among cases was 16.21 % (59 out of 364) and the overall neonatal mortality among cases was 2.2 % (8 out of 364).

The neonatal morbidity was 24.1% (20 out of 83) among very severely anaemic group and 13.88% (39 out of 281) among severely anaemic group. The neonatal mortality was 7.23% (6 out of 83) among very severely anaemic group and 0.71% (2 out of 281) among severely anaemic group.

Table-27: Distribution of neonatal morbidity as per etiology

S. No	Neonatal morbidity	CasesN(%)	Very severe anaemia N (%)	Severe anaemiaN (%)
1	Hyper bilirubinemia	23 (6.32)	17(20.48)	6(2.14)
2	Neonatal sepsis	17(4.67)	9(10.84)	8(2.84)
3	RDS	13(3.57)	7(8.43)	6(2.14)
4	Neonatal seizures	12(3.3)	7(8.43)	5(1.78)
5	Blood transfusion	9(2.47)	5(6.02)	4(1.42)
7	MAS	21(5.77)	15(18.07)	6(2.14)

In this study most common neonatal morbidity etiology was Hyper Bilirubinemia 6.32% 23 out of 364), next most common etiology was MAS 5.77% 21 Out of 364).

20.48% (17 out of 83) very severe anaemia, 2.14% (6 out of 281) severe Anaemia Neonates were suffered with hyper bilirubinemia.

10.84% (9 out of 83) very sever anaemia, 2.84% 8 out of 281) severe anaemia Neonates were suffered with neonatal sepsis.

8.43 % (7 out of 83) very sever anaemia, 2.14% 6 out of 281) severe anaemia Neonates were suffered with RDS.

8.43 % (7 out of 83) very sever anaemia, 1.78% (5 out of 281) severe anaemia Neonates were suffered with Neonatal seizures.

Table 28: Distribution of neonatal morbidity according to gestational age

S.NO	Aetiology of neonatal mortality	Preterm <37weeks	Term 37-40weeks	Post term >40weeks
1	Hyper bilirubinemia	15(4.12)	6(1.65)	2(0.55)
2	Neonatal sepsis	10(2.75)	5(1.37)	2(0.55)
3	RDS	6(1.65)	4(1.1)	3(0.82)
4	Neonatal seizures	4(1.1)	3(0.82)	5(1.37)
5	Blood transfusion	6(1.65)	2(0.55)	1(0.27)
6	MAS	6(1.65)	5(1.37)	10(2.75)

In this study most common aetiology for preterm and term neonatal death was hyper bilirubinemia 4.12 % (15 out of 364) and post term neonatal death was neonatal seizures 1.37% (5 out of 364)

Table-29: Duration of stay in the hospital

S. No	Duration of stay	Cases N (%)	Very severe anaemia N (%)	Severe anaemia(%)
Vaginal				
1	< 4days	88 (24.17)	19(5.21)	69 (18.19)
2	>4 days	186(51.09)	41(11.2)	145(39.83)
LSCS				
1	< 10 days	66 (18.13)	14(3.84)	52(14.28)
2	>10 days	24(6.59)	9(2.47)	15(4.12)

In this study duration of hospital stay after vaginal delivery <4 days was 24.17% (88 out of 364) and > 4 days was 51.09% (186 out of 364).

In the Present study duration of hospital stay after LSCS, <10 days was 18.13% (66 out of 364), >10 days was 6.59% (9 out of 364).

Discussion

Out of 10311 cases admitted in the labour room within one year, 364 cases had Severe (281), very severe anaemia (83) cases and they were studied to find out foeto maternal complications. Rest of the cases had mild anaemia 626 or no anaemia. In our study overall Prevalence of anaemia in pregnancy was 77.49% which is compared to a study by Ashram Khatana et al[4] which had the 80% anaemia prevalence. In the present study total of 364 subjects were studied -

- 83 very severe anaemic Cases
- 281 severe anaemic cases
- The present study aimed at analysing the fetomaternal outcome in women with anaemia (severe and very severe type) presenting in labour.
- In the present study the subjects presenting in labour with Hb< 7g% were included as cases.
- The subjects with 4-7g% were grouped as severe anaemia and <4g% were grouped as very severe anaemia.

Description of socio demographic variables

Majority of subjects in the study group belonged to 20-24 yrs age group. 60.99% of cases belonged to this age group. This is comparable to the study conducted by Rameshwari et al (2014)[5] in which 68% of subjects belonged to same age group and also to Khandait WD et al (2001)[6] in which 70% of subjects belonged to same age group as in our study. Similar results 60 % were in found in the study done by Singh R et al (2019)[7].

Low socio economic status is a risk factor for anaemia due to poor nutrition, improper sanitation and unhygienic habits. This may also lead to worm infestations which are very common in developing countries like India, which is also an important cause of anaemia. In the present study 64.84% of the cases belonged to low socio economic group. This is comparable to studies conducted by Nirmala Devi.B et al (2015)[8] in which the 78% and 88% of anaemic subjects belonged to low socioeconomic groups respectively.

Description of Booking Status

Regular antenatal checkups and adequate antenatal care is the corner stone of safe motherhood. Unbooked cases were more in the very severe anaemia group cases 89.16% compared with severe anaemia group cases 68.68%. In the present study 73.35 % of the cases were unbooked. This is comparable to studies done by Rameshwari et al (2014)[5], Nirmala Devi et al (2015)⁸ and Chinthan Upadhyay et al (2013)[9] in which 76% ,67% and 74.2% of cases were unbooked respectively. Similar results were found 84.7% in the study done by Singh S et al (2018)[10].

Description Parity

In the present study 60.44% of cases were multigravida. This is comparable to studies conducted by Awasthi et al (2001)[3], Nirmala Devi .B et al (2015)[8], Rohilla et al (2010)[15] in which 65.5% , 65%, 68% subjects were multigravida respectively. Lower results were 32% found in the study done by Singh R et al (2019)[57]. Multi Para group cases were having the more anaemia cases 60.44% compared with Primi group cases 39.56% -similar results were found in the study done by Singh S et al (2018)[10] 60.4%.

Description of Birth Spacing

In this study 66.48 % of cases had birth spacing < 2 years which can be compared to studies done by Chinthan Upadhyay et al (2013)[9] and Khandhail WD. et al (2001)[11] in which 61.2% and 55.9% of multipara cases had birth spacing <2 years. Birth spacing <2 years Group cases were having the more anaemia cases 66.48% compared to the > 2years birth spacing group cases 33.52%.

Description of Mode of Delivery

In our study 78.27 % of cases had vaginal delivery. These results can be compared to study done by Awasthi et al (2001)[3] in which 69.5% of cases and 89% of controls had vaginal delivery. In present study 7.42 % of cases had assisted vaginal deliveries

(instrumental deliveries) which can be contrary to the study done by Shrivastava M et al (1999)[12] in which 32% of cases.

In the present study 24.73 % of cases had caesarean delivery which can be compared to study conducted by Awasti et al (2001)[3] where 20% of cases.

Description about Delivery

43.96 % (160 out of 364) of cases had preterm labour, 46.43% (169 out of 364) cases had term labour, 9.62 % (35 out of 364) of cases had post term labour. Similar results were found in the study done by Singh S et al (2018)[10] 42.8%.

Description about Labour complications

Most commonly associated complication with anemia is preeclampsia. In our study 115 cases (31.59%) of cases out of 364 cases presented both with anemia and preeclampsia.

In our study 2.74% of cases (10 cases) presented with twin gestation with severe anemia. anemia in mother is more common in twin gestation due to increased iron and folate requirement by two fetuses.

50% of twin pregnancies in our study presented with severe anemia and preeclampsia. preeclampsia is three times more common in multiple gestation than in singleton pregnancy due to exposure to superabundance of chorionic villi.

43.96% of cases of severe anemia presented in latent phase of labour. 56.04% of cases of severe anemia presented in active phase and second stage of labour, so there was no adequate time for transfusion of blood in majority cases before labour. only in those cases who presented in latent phase of labour had blood transfusion before labour.

Complications of 1st stage of labour prolonged labour 26.51%, Precipitation of labour 9.4%, cardiac failure 3.61%, PROM 19.23% were more common in the very severe anaemia group case compared to the severe anaemia group cases 13.88%, 3.56%, 0.36%, and 6.76% respectively.

Complications of 2nd stage of labour maternal exhaustion 21.69%, cardiac failure 1.2%, and obstructed labour 4.82% were more frequent in the very severe anaemia age group compared to severe anaemia group cases 8.54%, 0.71% , 1.78% respectively.

Anaemic patients cannot tolerate even the normal blood loss during the delivery. Even the minimal blood loss may be detrimental and may lead to complications like PPH.

In the present study 8.52 % among the cases had PPH. All were atonic PPH which were managed medically. These results were comparable to the studies done by Agarwal et al (2004)[13] in which 9.8% and 10% of cases had PPH respectively. Similar results were found in the study of Singh S et al (2018)[10] 10.4 %.

In our study 0.59% of cases had retained placenta. These results can be compared to study done by Awasthi et al (2001)[3] in which 2% of cases had retained placenta.

In this study 2.47% of cases had CCF. These observations can be compared to studies done by Rameshwari et al (2014)[5] and AlkaBatar et al (2015)[14] in which 8% and 6.15% of cases had CCF. Similar results were found in the study of Singh S et al (2018)[10] 1.4 % .4 cases had cardiac failure antenatally, 3 cases had cardiac failure in second stage of labour, 2 cases developed immediately after labour. maternal mortality in our study is seen in 2 cases who had cardiac failure with severe preeclampsia and anemia.

Description of Puerperal complications

Anemia decreases immune capacity of the patient and predisposes to the patient for infections, and there will be delayed wound healing. In this study 7.69% cases had puerperal pyrexia. These observations can be comparable to study undertaken by Rohilla et al (2010)[15] in which 8.33% of cases had puerperal pyrexia.

In the present study 3.3 % of cases had puerperal sepsis. These results can be compared to study done by AlkaBatar et al (2015)[14] in which 10% of cases had puerperal pyrexia. In our study 8.52 % of cases had sub involution. This is comparable to study conducted by Awasthi et al (2001)[3] in which 2% of cases had sub involution.

In our study 10.99% of cases had lactation failure. This observation is comparable to study done by S Patra et al (2005)[54] in which 6.9% study subjects had lactation failure. In this study 1.92% of cases had Episiotomy wound gaping and 4.12% cases had LSCS wound gaping. All puerperal complications, puerperal pyrexia 8.43%, puerperal sepsis 6.02%, sub involution 18.07%, Lactation failure 15.66%, episiotomy wound gaping 2.41%, LSCS wound gaping 10.83% were more common in the very severe anaemia group cases compared to severe anaemia group cases 7.47%, 2.5%, 5.69%, 9.61%, 1.78%, 2.14% respectively. Maternal mortality in our study is seen in 2 cases which had cardiac failure due to severe preeclampsia associated with anemia. With severe anemia duration of stay in the hospital is increased. Inputs with normal vaginal the average duration of stay in hospital is only 24hrs-48hrs and in LSCS 6-7days. In our study cases who had vaginal delivery 24.17% stayed in the hospital for less than 4 days, and 51.09% had stayed in the hospital for more than 4 days. In cases who underwent LSCS 18.13% had duration of stay in hospital for less than 10 days, and in 6.59% for greater than 10 days. Out of 364 cases with severe anemia 7.69% (28 cases) has ICU admission for acute medical care. In them maternal mortality is seen in 0.54% of cases, 7.14% of cases contribute of near miss cases.

Description of Neonatal Complications

Preterm birth remains one of the greatest causes of preinatal mortality and morbidity worldwide. Preterm birth occur through multiple pathways, with maternal infection, hypoxia and oxidative stress which are the three major postulated mechanisms. Anemia with low hemoglobin may cause a state of low grade chronic hypoxia that induces maternal and fetal stress. An activated immune system in the presence of infections and inflammation and corticotropin releasing hormone or cortisol that are released following a stress responses, can activate the maternal and fetal hypothalamic-pituitary-adrenal axis. This in turn can initiate labour and eventually result in preterm parturition. Also iron deficiency may also increase oxidative stress resulting in damage to erythrocytes and the fetoplacental unit. 43.96% of cases had preterm births which can be compared to studies done by Nirmala Devi B et al (2015)[8] in which the preterm birth rates was 44.68% respectively. 20.05% of cases had IUGR births which can be compared to study done by Chinthan Upadhyay et al (2013)[9] where 28% of cases had IUGR births. 70.8% of cases of IUGR cases are seen in cases of preeclampsia and anemia. In this study babies of 15.66% of cases had NICU admission which can be compared to study done by Chinthan Upadhyay et al (2013)[9] in which babies of 25.5% of cases had NICU admission. In present study 39.56% of cases had LBW (<2.5kg) which can be compared to study done by Awasthi et al (2001)[3] in which 37.5% of cases had LBW babies. In our study most common cause of intrauterine uterine death accounts to 2.75% of perinatal deaths. 20% of neonatal mortality is due to neonatal sepsis which is compared to a study done by Awasthi et al (2001)[3] which has 21% neonatal mortality due to neonatal sepsis.

Description of Neonate health status

Neonatal morbidity is seen in 16.21% of the cases in our study which is compared with a study done by, Nirmala Devi B et al (2015)[8] which has neonatal morbidity of 19.78%. Hyperbilirubinemia (6.32%), MAS (5.77%), neonatal sepsis (4.67%), neonatal seizures (3.3%), blood transfusion (2.47%) contributes to overall neonatal morbidity. In our study > 2500grams birth weight babies were 60.44%, <1000grams birth weight babies were 5.5%. Very severe anaemia group cases gave birth to more number of LBW babies 57.83% compared to severe anaemia group cases 34.16%.

Conclusion

The prevalence of anaemia in pregnant women is high due to illiteracy, ignorance, low socio economic status, lack of proper antenatal care, close birth spacing, multiparity. It is recommended that good antenatal care be available, accessible and affordable to all pregnant women through partnership between government and nongovernmental organisations creating awareness through public

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health programmes and fortification of food which will improve the nutritional status of women.

The management of a case of woman with severe anemia in labour is a challenge to an obstetrician because it is very difficult to explain the risk and consequences of severe anemia to patient attenders and making them to accept the risk. It is very difficult to arrange the blood in time, adequate manpower for monitoring these high risk cases. Obstetrician should also face the consequences of adverse reactions following blood transfusion. Due to increased maternal mortality and morbidity in cases of severe anemia in labour there is a lot of psychological and economical burden on the family members also.

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