

## **Maternal outcome in pregnancy with severe anaemia: Prospective study in a tertiary care hospital in Andhra Pradesh**

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**Abstract:** Anaemia is the commonest medical disorder in pregnancy and severe anaemia is associated with poor maternal and perinatal outcome. The study aimed to analyze the characteristics of hospitalized pregnant women with severe anaemia (Haemoglobin lower than 7gms %) at the time of delivery and to find out maternal outcome. It is a prospective study done at Government general hospital, Kurnool, Andhra Pradesh, India over a period of one year from October 2007 to September 2008. Results were analyzed. Out of 9731 deliveries during study period 282 (2.89%) cases were severely anemic at the time of delivery. Among 282 women patients with severe anaemia 250 (88.65%) patients belongs to low socioeconomic category, 190 (67.4%) were unbooked cases, 151 (53.55%) cases from rural area and 184 (65.24%) cases were multi gravidas. The observed maternal complications during antenatal period were Pre-eclampsia and eclampsia (25.33%), intercurrent infections, abruptio placentae (8.5%), heart failure (1.06%), preterm labours (44.68%) and intrauterine deaths (16.67%) and during labour postpartum haemorrhage (6.4%), cardiac failure and maternal mortality (1.06%). Severe anaemia during pregnancy is associated with maternal morbidity and mortality so effective preventive measures in the form of regular antenatal checkups and iron supplementation will prevent complications of anaemia in pregnant women.

**Keywords:** Haemoglobin(Hb), Maternal outcome, Pregnancy, Prevalence, Severe anaemia.

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### **I. Introduction**

Anaemia is the commonest medical disorder in pregnancy and has a varied prevalence, etiology and degree of severity in different populations being more common in non-industrial countries<sup>1</sup>. World Health Organization definition for diagnosis of anaemia in pregnancy is a haemoglobin concentration of less than 11 g/dl (7.5mmol/l) and a hematocrit of less than 0.33<sup>2</sup>. The World Health Organization uses the following haemoglobin cutoffs to define anemia in pregnant women. 100 to 109 g/l for mild anemia, 70 to 99 g/l for moderate anaemia and lower than 70 g/l for severe anaemia. In India, more than 90% of anaemia cases are estimated to be due to iron deficiency because high iron requirement during pregnancy are not easily fulfilled by dietary intake especially when iron bio-availability is poor<sup>3</sup>. Estimates from the World Health Organization report that from 35% to 75% (56% on average) of pregnant women in developing countries and 18% of women from industrialized countries are anaemic<sup>4</sup>. However many of these women were already anemic at the time of conception with an estimated prevalence of anaemia of 43% of non-pregnant women in developing countries and 12% in women in wealthier regions. The prevalence of anemia is high in central Asia and reported as 61-91% in India<sup>5,6</sup>. Anaemia is responsible for 20-40% of maternal deaths directly or indirectly through cardiac failure, preeclampsia, antepartum haemorrhage, postpartum haemorrhage and puerperal sepsis<sup>7</sup>. Ram Hari Ghimire and Sita Ghimire found that pregnancy induced hypertension is five times more common in severe anaemia and significant proportion of patients had postpartum haemorrhage with severe maternal Anaemia<sup>8</sup>. F.W. Lone et al found that risk of preterm delivery was four times greater among women with anaemia<sup>9</sup>. Sangeetha et al noticed severe maternal anaemia has poor outcome of neonates in the form of low birth weight, prematurity, intrauterine growth retardation, intrauterine death and birth asphyxia<sup>10</sup>.

A pregnant woman must have at least 500mg of stored iron to fulfill the requirements of gestation without the need for iron supplementation. Even though this deposit is present it will be completely exhausted by the end of gestation. The total iron requirement during pregnancy is 700-1400mg. Overall requirements is 4mg-6mg per day, but this increases to 6-8 mg per day in the last weeks of pregnancy.

Anaemia is not only responsible for increase in perinatal and maternal mortality but also severely affects economic and social status of the country. Keeping these facts in mind the present study was aimed to determine the prevalence, severity and socio-economic status and gestational age factors associated with severe

anaemia in pregnancy at the initial booking visit and the maternal outcome in Government General Hospital, Kurnool over a period of one year from October 2007 to September 2008.

## II. Materials And Methods

It is a prospective study done at Government General Hospital, Kurnool over a period of one year from October 2007 to September 2008. Government general hospital, Kurnool is a tertiary care hospital situated in the Rayalaseema region of Andhra Pradesh. Pregnant woman with severe anemia i.e. haemoglobin levels less than 7g/dl at the time of delivery were included in the study. Women with severe anaemia prior to the onset of labour and patients who have severe anaemia at the time of delivery due to acute bleeding with antepartum hemorrhage were excluded.

## III. Methodology

A prospective study was conducted on women in labour with Haemoglobin of lower than 7g /dl. All patients admitted in labour room at the time of delivery had undergone haemoglobin estimation, routine investigations and the women with haemoglobin lower than 7g/dl were recruited in the study after stratifying the inclusion and exclusion criteria. Only woman with singleton pregnancies were included. Data collected included socio-demographic characteristics (age, parity, residence, education and antenatal care), maternal outcomes (preterm labour, preeclampsia, antepartum haemorrhage and cardiac failure). The following parameters were observed in the women. General conditions of the mother at the time of delivery, Signs of cardiac failure, Details of labour: 1<sup>st</sup> stage, 2<sup>nd</sup> stage and 3<sup>rd</sup> stage, amount of blood loss, weight of the placenta, establishment of lactation, rate of uterine involution and mortality.

## IV. Statistical Analysis

Information of cases under study was arranged in a systemic manner in MS Excel sheet. Appropriate statistical analysis was done using frequencies, cross tabulation and percentages. Conclusions made as per the respective levels of significance.

## V. Results

Number of deliveries during the study period was 9731. Out of 9731 deliveries 282 (2.89%) were severely anaemic at the time of delivery with different age groups.

**Table 1: Different factors of pregnant women affecting anaemia**

Characteristics	No. of Patients
<b>Haemoglobin Percentage level</b>	
5-7 grams/dl	243(86.2)
<5 grams/dl	39(13.8)
Total	282 (100.0)
<b>Age Group</b>	
< 20 years	13 (4.6)
20-24 years	193 (68.4)
25-29 years	56 (19.9)
30 & above	20 (7.1)
Total	282(100.0)
<b>Socio-economic status</b>	
Low	250(88.65)
Middle	32(11.35)
Total	282 (100.0)
<b>Booked Status</b>	
Booked cases	92(30.6)
Un booked cases	190(67.4)
Total	282(100.0)
<b>Gestational Age</b>	
> 37 weeks	147(52.1)
34.-37 weeks	73(25.9)
< 34 weeks	62(22.0)
Total	282(100.0)
<b>Residence</b>	
Rural	151(53.55)
Urban	131(46.45)
<b>Parity</b>	
Primigravida	98(35)
Multi gravida	184(65.24)

Out of 282 cases, 193 (68.4%) cases were between 20-24 years of age group followed by 56 (19.9%) cases with 25-29 years, 20 (7.1%) cases were above 30 years of age and 13 (4.6%) cases were observed below 20 years of age groups. There were 243 (86.02%) women with 5-7g % haemoglobin followed by 39 (13.08%) women with haemoglobin less than 5g %. Among 282 women patients with severe anaemia, 250 (88.65%) patients belong to low socioeconomic category followed by 32(11.35%) belong to middle socioeconomic category. Similarly, women who booked were less likely to be anemic (30.6%) compared to the unbooked patients (67.4%). The observed difference was statistically significant. Furthermore more number of cases was found at 37 weeks of gestational age, followed by women who have 34-37 weeks and below 34 weeks of gestational age respectively. Women with severe anemia residing in rural area were 151 (53.55%) and residing in urban area were 131(46.45%). Most of the women with severe anaemia were multigravidas 184 (65.24%).

**Table2: Obstetric outcome in pregnant women with severe Anaemia**

S.No	Mode of delivery	Number	Percentage
1	Normal vaginal deliveries - SVD	210	74.46%
2	SVD + Oxytocin	56	20%
3	Cesarean Section	42	15%
4	SVD + Misoprostol	30	10.63%
5	Outlet Forceps	30	10.63%
6	Rupture Uterus	1	0.35%

Spontaneous normal vaginal deliveries are 210 cases (74.46%) in present study. Augmentation of labour was done with oxytocin in 56 cases (20%). Caesarean section was done in 42 cases(15%) for obstetrical indications. Abnormal labour with outlet forceps was done in 30 cases (10.63%). Labour induced with misoprostol in 30 (10.63%) cases. Patients with severe anaemia in labour with cardiac failure were managed with propped up position, sedation, oxygen, diuretics and packed cell transfusions. Second stage of the labour was cut short with outlet forceps when indicated. Intensive monitoring was continued in postpartum period by adequate rest, monitoring of vitals, antibiotics and early ambulation to prevent thromboembolism. Rate of uterine involution was 0.5-1.0 cm/day. Lactation was established in all patients on the second day of delivery.

**Table3: Severe anaemia – Associated maternal complications**

Complications	No.of women	Percentages
Preterm labour	135	47.87%
Preeclampsia	72	25.33%
Intrauterine growth retardation	36	12.77%
Intrauterine fetal death	47	16.67%
Abruption placentae	24	8.51%
Placenta previa	7	2.00%
Malaria fever	1	0.35%
Cardiac failure	3	1.06%
Mortality	3	1.06%

The commonest complication of severe anaemia observed in the present study was preterm labour showing higher incidence of 135 cases (47.87%). Preeclampsia was seen in 72 cases (25.33%) in present study. Intrauterine growth restriction was noticed in 36 cases (12.77%). Intrauterine death was found in 47 cases (16.67%). Abruption placentae was noticed in 24 patients (8.51%). Placenta previa was noticed in 7 cases (2%). In the present study postpartum haemorrhage was seen in 18 cases (6.4%). Cardiac failure is noticed in 3(1.06%) cases and mortality in 3(1.06%) cases. Cause of mortality was decompensated cardiac failure due to severe anaemia in two cases and anaemia complicated with malarial fever in one case.

## VI. 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 is evident from the study. Worldwide, it is estimated that 58.27 million women are anaemia during pregnancy, of whom 55.75 million (95.7%) live in developing countries. Recent estimations suggest that up to 60% of pregnant women in developing countries including India may be anemic and nearly 7% of pregnant women are severely anemic. Severe anemia of pregnancy contributes significantly to maternal morbidity and mortality. In present study the prevalence of severe anaemia (Haemoglobin less than 7 gms%) was 2.89% whereas Singhal et al study had the prevalence of 5.7%<sup>11</sup> and in Ranju Agarwal study it was 7.4%<sup>12</sup>. Srinivas Rao and Srikanth (2013) also reported that 3.4% of pregnant women were severely anemic<sup>13</sup> and Riffatjael reported 4.8% of severe anaemia in pregnant women<sup>14</sup> which was higher than the present study.

In present study, the proportion of pregnant women with anemia was not inversely related to their age as seen in some studies from other parts of the India. The age group 20-24 years had the highest prevalence of

anaemia (68.4%) which agrees with the findings of Rajeswari and Ashok Kumar,<sup>15</sup> and Rajaratnam<sup>16</sup> et al in studies done in Orissa and Tamil Nadu reported the prevalence of 51% and 71.9%. There has been increased risk of anaemia among pregnant adolescents (teenage pregnancy) due to depleted iron stores that occurred during the adolescent growth spurt<sup>17</sup>.

Anaemia prevalence was also significantly high in pregnant women from low socioeconomic status (87.6%) compared to those from middle socioeconomic status (12.4%). Studies from Allen et al<sup>18</sup>, Rajaratnam et al and ME Bentley<sup>19</sup> also reported the same observations. Women with low socioeconomic status may not afford or have access to good maternal health care services because of lack of education or financial constraints. They are therefore more prone to the deleterious effects of poor nutrition, malaria, diarrheal diseases and chronic infections. Diminished intake and increased demands of iron, disturbed metabolism, pre-pregnant health status and excess iron demands as in multiple pregnancies, women with rapidly recurring pregnancies, blood loss during labor, heavy menstrual blood flow, inflammation and infectious diseases are important factors which lead to development of anaemia during pregnancy<sup>20</sup>.

Increased risk of anemia was observed in the pregnant women who booked at the time of the delivery compared to the booked pregnant women. Boniface et al also reported that obstetric risks were more in unbooked pregnant women compared to booked ones<sup>21</sup>. There may be expected decline in Haemoglobin level due to hemodilution, increasing fetal demand, underlying maternal infection and untreated anaemia in early pregnancy may also get worse with advancing pregnancy. The booked patient benefits from focused antenatal care objectives, which although not yet scientifically proven to reduce maternal and fetal morbidity/mortality, have obvious benefits in terms of risk assessment, active management, correction of modifiable conditions, and boosting the psychological support and family preparedness for a new child.

**Table 4: Severe anaemia – maternal complication in different study groups.**

S.No	Parameter	Awasthi et al (2001)	Ranju Agarwal et al (2002)	Singhal et al (2007)	Riffaljaleel study (2008)	M.Rohilla et al (2010)	Present Study (2008)
1	Preterm Labour	9.5%	22%	32%	23.5%	18.75%	44.68%
2	Pregnancy induced hypertension	28%	7.1%	19.33%	-	17.7%	25.33%
3	Abruption placenta	-	-	10.8%	5.9%	3.12%	8.5%
4	Placenta previa	-	-	10.8%	-	-	2%
5	Abruption with Placenta previa	10.5%	0.68%	-	-	-	-
6	Postpartum haemorrhage	7.5%	0.4%	7.6%	9.8%	25.5%	6.4%
7	Intra uterine growth restriction	37.5%	-	6.62%	27.8%	33.33%	12.77%
8	Cardiac failure	-	-	4.97%	1.9%	9.37%	1.06%
9	Mortality	-	-	-	1.9%	6.25%	1.06%

Preterm labour is more common in present study with 44.68%. In Singhal et al study it was 32.59%, 22% in Ranju Agarwal study, 9.5% in Awasthi et al<sup>22</sup> study 23.5% in Riffatjaleel study and 18.75% in M. Rohilla et al<sup>23</sup> a tertiary hospital based study from northern India. Pregnancy induced hypertension in present study was 20.33%, In Singhal et al study it was 19.33%, Awasthi et al study it was 25.33% and M. Rohilla et al study it was 17.7%. As shown in the comparison study chart the results of present study correlate well with Singhal et al study and Awasthi et al study.

## VII. Conclusion

Nowadays also the prevalence of anaemia in pregnant women is due to illiteracy, ignorance, low socioeconomic status, late antenatal booking and lack of proper antenatal care. By keeping this in view, it is recommended that good antenatal care should be made available, accessible and affordable to all pregnant women through partnership between all tiers of government and non-governmental organizations. Creating awareness through public health programs and fortification of food will improve nutritional status of pregnant women. Timely identification of women with severe anaemia and associated maternal complications and corrective actions for identified problems during their management like antepartum haemorrhage, postpartum haemorrhage can help in reducing maternal mortality and morbidity. New and innovative strategies are needed, particularly those that improve the overall health and nutrition status of adolescent girls before they enter their reproductive years. Early marriages and teenage pregnancies are better avoided. Awareness created regarding dietary habits, small family norms, birth spacing, regular antenatal checkups and regular intake of iron.

**Conflict Of Interest:** The authors have no conflict of interest.

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