

ASSESSMENT OF THE SEVERE ANAEMIA PREVALENCE AND ASSOCIATED FETO-MATERNAL OUTCOMES IN FEMALES ADMITTED FOR LABOR: A PROSPECTIVE CLINICAL STUDY

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ABSTRACT

Background: There exists a high prevalence of anaemia in pregnant females owing to multiparity, close birth spacing, lack of appropriate antenatal care, low socioeconomic status, ignorance, and illiteracy.

Objectives: The present study was conducted to assess the incidence of severe anaemia with having hemoglobin of less than 7gm% in pregnant females and to assess the fetal outcomes following delivery in females having severe anaemia.

Methodology: A total of 1000 pregnant subjects were screened for anaemia. The pregnant females having Hb% of <7g% in labor were included and feto-maternal outcomes in these females were evaluated.

Results: Puerperal complications seen were wound gaping, episiotomy, lactation failure, sub involution, sepsis, and pyrexia in 2.46% (n=2), 2.46% (n=2), 8.64% (n=7), 7.40% (n=6), 2.46% (n=2), and 7.40% (n=6) subjects respectively in severe anaemia group, and in 12.12% (n=4), 3.03% (n=1), 15.15% (n=5), 18.18% (n=6), 6.06% (n=2), and 9.09% (n=3) subjects respectively with very severe anaemia. Mortality was seen in 3.03% (n=1) subject with very severe anaemia. Morbidity was seen in 27.16% (n=22) subjects with severe anaemia and in 45.45% (n=15) subjects with very severe anaemia. The fetal outcomes were also evaluated in the study subjects. Low birth weight was seen in 7.40% (n=6) subjects with severe anaemia and in 6.06% (n=2) subjects with very severe anaemia. Neonatal mortality and morbidity was seen in 1.23% (n=1) and 13.58% (n=11) subjects respectively with severe anaemia, and in 6.06% (n=2) and 24.24% (n=8) subjects respectively with very severe anaemia. Fetal complications seen in the present study were birthplasia in 1.23% (n=1) and 3.03% (n=1) subject with severe and very severe anaemia respectively, sepsis in 1.23% (n=1) and 3.03% (n=1) subject with severe and very severe anaemia respectively, and IUGR in 1.23% (n=1) subject with severe anaemia.

Conclusion: The present study concludes that the active involvement of various non-governmental and governmental organizations can help in providing affordable and accessible antenatal care and nutritional care to improve the fetomaternal outcomes.

Keywords: Anaemia, Maternal Deaths, multigravida, Neonatal Morbidity, Preterm low-birth

INTRODUCTION

One of the major and most common hematologic problems encountered in females globally is anaemia. It is usually diagnosed in pregnant females. Anaemia has a very high prevalence in pregnant Indian females with a prevalence rate of as high as 80%. Anaemia constitutes the second most common cause of maternal death in India leading to nearly 40% of the reported deaths.¹

The most commonly affected subjects with anaemia are young children, adolescents, and females of childbearing age. Half of the cases of anaemia reported in pregnant females are owing to iron deficiency than due to malnutrition. Iron deficiency anaemia can also be seen due to infections where significant blood is lost including hookworm infection and parasitic infections.²

Also, bacterial and viral infection may hamper the food intake, its absorption, and may compromise the nutrients extraction and storage including iron. It also leads to conception antedate which is often increased in delivery and pregnancy. In pregnant females having severe anaemia, increased incidence bacteraemia, infection susceptibility, sepsis, preterm labor, and/or antepartum hemorrhage.³ At the time of labor in subjects with anaemia, there is increased maternal mortality, maternal exhaustion, and uterine inertia. At Puerperium, increased incidence of lactation failure wound gaping, delayed healing of the wound, thromboembolic events, and puerperal sepsis. Adverse effects seen in fetuses include poor perinatal outcomes, perinatal mortality, stillbirths, low APGAR score at birth, intrauterine growth restrictions, low-birth weight, increased prematurity risk, and poor birth parameters.⁴

Maternal and perinatal morbidity is caused by various factors where anaemia remains one of the most common causes. Antenatal care in pregnancy is primarily aimed at the prevention of anaemia during pregnancy to ensure future health, puerperium, and labor safety. In countries like India, with a high prevalence of low socioeconomic status, anaemia, less difference in two pregnancies, improper antenatal care, and multiparity, which contribute to the high prevalence of anaemia in Indian females.⁵

Hence, the present prospective clinical study was conducted to assess the incidence of severe anaemia with having hemoglobin of less than 7gm% in pregnant females and to assess the fetal outcomes following delivery in females having severe anaemia.

MATERIALS AND METHODS

The present prospective clinical study was conducted to assess the incidence of severe anaemia with having hemoglobin of less than 7gm% in pregnant females and to assess the fetal outcomes following delivery in females having severe anaemia. The study was carried out at Department of Obstetrics and Gynaecology, Chandulal Chandrakar Memorial Medical College Bhilai Durg, Chhattisgarh from July 2014 to September 2015 after obtaining clearance from the concerned Ethical committee.

The inclusion criteria for the study were subjects who were pregnant, any parity, hemoglobin less than 7gm%, and the subjects who were willing to participate in the study. The exclusion

criteria for the study were subjects having anaemia with hemoglobin of more than 7gm%, having a history of anaemia before conception, anaemia, anaemia due to excessive bleeding, and subjects who were not willing to participate in the study. After explaining the detailed study design, informed consent was taken from all the subjects in verbal and written form.

The subjects were further divided into two groups having subjects with severe anaemia in the range of 4-7gm% and very severe anaemia with hemoglobin of less than 4 gm%. The investigations were carried out in all the subjects including 2D echo, ECG, ultrasonography, HIV, HCV, HbsAg, urine investigations (microscopy, globulin, and albumin), and hematologic parameters including peripheral smear, blood group typing, serum proteins, and complete hemogram.

The anaemia severity was assessed in all the study subjects. A total of 1000 pregnant subjects were screened for anaemia. The pregnant females having Hb% of <7g% in labor was included and foeto-maternal outcomes in these females were evaluated. The details recorded were medical disorder, birth spacing, socioeconomic status, parity, and age, prostate hypertension, retained placenta, operative interference, delivery mode, and gestational age. Puerperal complications assessed were lower LSCS wound gaping, episiotomy wound gaping, lactational failure, subinvolution, puerperal sepsis, and pyrexia. Fetal outcomes assessed were birth weight, admission in NICU, IUGR, stillbirths, and live births. Fetal and maternal mortality and morbidity were also assessed.

The collected data were subjected to the statistical evaluation using SPSS software version 21 (Chicago, IL, USA) and one-way ANOVA and t-test for results formulation. The data were expressed in percentage and number, and mean and standard deviation. The level of significance was kept at $p < 0.05$.

RESULTS

The present prospective clinical study was conducted to assess the incidence of severe anaemia with having hemoglobin of less than 7gm% in pregnant females and to assess the foetal outcomes following delivery in females having severe anaemia. A total of 1000 pregnant subjects were screened for anaemia where only 998 were included in the study where 81 had severe anaemia and 33 subjects had very severe anaemia leaving the final sample size of 124 subjects. The pregnant females having Hb% of <7g% in labor was included and foeto-maternal outcomes in these females were evaluated. The study subjects were within the age range of 17-36 years with the mean age of 24.4 ± 4.26 years.

On assessing the complications seen in the anemic subjects, it was seen that retained placenta was seen in 3.03% (n=1) subject with very severe anaemia, cardiac failure in 2.46% (n=2) and 3.03% (n=1) subject with severe and very severe anaemia, obstructed labour in 2.46% (n=2) and 6.06% (n=2) subject with severe and very severe anaemia, maternal exhaustion in 7.40% (n=6) and 21.21% (n=7) subject with severe and very severe anaemia, and prolonged labour in 13.58% (n=11) and 24.24% (n=8) subject with severe and very severe anaemia respectively. Spontaneous vaginal delivery, assisted vaginal deliveries, and LSCS was done in 75.30% (n=61), 8.64% (n=7), and 23.45% (n=19) subjects of severe anaemia respectively and in 72.72% (n=24), 3.03% (n=1), and 24.24% (n=8) subjects with very severe anaemia respectively. The blood loss in vaginal delivery was 300-500ml in 74.07% (n=60) subjects with severe anaemia and >500ml in 12.12% (n=4) subjects with very severe anaemia (Table 1).

The results of the present study have shown that puerperal complications seen were wound gaping, episiotomy, lactation failure, sub involution, sepsis, and pyrexia in 2.46% (n=2), 2.46% (n=2), 8.64% (n=7), 7.40% (n=6), 2.46% (n=2), and 7.40% (n=6) subjects respectively in severe anaemia group, and in 12.12% (n=4), 3.03% (n=1), 15.15% (n=5), 18.18% (n=6), 6.06% (n=2), and 9.09% (n=3) subjects respectively with very severe anaemia. Mortality was seen in 3.03% (n=1) subject with very severe anaemia. Morbidity was seen in 27.16% (n=22) subjects with severe anaemia and in 45.45% (n=15) subjects with very severe anaemia as shown in Table 2.

The fetal outcomes were also evaluated in the study subjects. Low birth weight was seen in 7.40% (n=6) subjects with severe anaemia and 6.06% (n=2) subjects with very severe anaemia. Neonatal mortality and morbidity was seen in 1.23% (n=1) and 13.58% (n=11) subjects respectively with severe anaemia, and in 6.06% (n=2) and 24.24% (n=8) subjects respectively with very severe anaemia. Fetal complications seen in the present study were birthaplasia in 1.23% (n=1) and 3.03% (n=1) subject with severe and very severe anaemia respectively, sepsis in 1.23% (n=1) and 3.03% (n=1) subject with severe and very severe anaemia respectively, and IUGR in 1.23% (n=1) subject with severe anaemia. Congenital abnormalities were seen in no subject (Table 3).

DISCUSSION

The study subjects were within the age range of 17-36 years with the mean age of 24.4±4.26 years. The complications seen in the anemic subjects, it was seen that retained placenta was seen in 3.03% (n=1) subject with very severe anaemia, cardiac failure in 2.46% (n=2) and 3.03% (n=1) subject with severe and very severe anaemia, obstructed labor in 2.46% (n=2) and 6.06% (n=2) subject with severe and very severe anaemia, maternal exhaustion in 7.40% (n=6) and 21.21% (n=7) subject with severe and very severe anaemia, and prolonged labor in 13.58% (n=11) and 24.24% (n=8) subject with severe and very severe anaemia respectively. Spontaneous vaginal delivery, assisted vaginal deliveries, and LSCS was done in 75.30% (n=61), 8.64% (n=7), and 23.45% (n=19) subjects of severe anaemia respectively and in 72.72% (n=24), 3.03% (n=1), and 24.24% (n=8) subjects with very severe anaemia respectively. The blood loss in vaginal delivery was 300-500ml in 74.07% (n=60) subjects with severe anaemia and >500ml in 12.12% (n=4 subjects with very severe anaemia. These results were consistent with the studies of Singh S et al⁶ in 2018 and Khandail WD et al⁷ in 2001 where similar maternal complications were reported by the subjects as in the present study.

The results of the present study have shown that puerperal complications seen were wound gaping, episiotomy, lactation failure, sub involution, sepsis, and pyrexia in 2.46% (n=2), 2.46% (n=2), 8.64% (n=7), 7.40% (n=6), 2.46% (n=2), and 7.40% (n=6) subjects respectively in severe anaemia group, and in 12.12% (n=4), 3.03% (n=1), 15.15% (n=5), 18.18% (n=6), 6.06% (n=2), and 9.09% (n=3) subjects respectively with very severe anaemia. Mortality was seen in 3.03% (n=1) of subjects with very severe anaemia. Morbidity was seen in 27.16% (n=22) subjects with severe anaemia and 45.45% (n=15) subjects with very severe anaemia. These results were in agreement with the studies of Rohilla M et al⁸ in 2010 and AlkaBatar et al⁹ in 2015 where mortality and morbidity shown by the authors were similar as in the present study.

The fetal outcomes were also evaluated in the study subjects. Low birth weight was seen in 7.40% (n=6) subjects with severe anaemia and 6.06% (n=2) subjects with very severe anaemia. Neonatal mortality and morbidity was seen in 1.23% (n=1) and 13.58% (n=11) subjects respectively with severe anaemia, and in 6.06% (n=2) and 24.24% (n=8) subjects respectively with very severe anaemia. Fetal complications seen in the present study were birthplasia in 1.23% (n=1) and 3.03% (n=1) subject with severe and very severe anaemia respectively, sepsis in 1.23% (n=1) and 3.03% (n=1) subject with severe and very severe anaemia respectively, and IUGR in 1.23% (n=1) subject with severe anaemia. Congenital abnormalities were seen in no subject. These findings were comparable to the fetal outcomes seen in the studies by Upadhyay C et al¹⁰ in 2013 and Devi BN et al¹¹ in 2015 where fetal mortality, morbidity, and outcomes were comparable to the present study.

CONCLUSION

Within its limitations, the present study concludes that anaemia is highly prevalent in Indian females owing to multiparity, close birth spacing, adequate antenatal care, low socioeconomic status, ignorance, and illiteracy. The active involvement of various non-governmental and governmental organizations can help in providing affordable and accessible antenatal care and nutritional care to improve the fetomaternal outcomes. However, the present study had a few limitations including a small sample size, short monitoring period, and geographical area biases. Hence, more longitudinal studies with larger sample size and longer monitoring period will help reach a definitive conclusion.

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TABLES

| Parameters | Severe anaemia % (n=81) | Very severe anaemia % (n=33) |
|--|-------------------------|------------------------------|
| Complications | | |
| Retained placenta | 0 | 3.03 (1) |
| Cardiac failure | 2.46 (2) | 3.03 (1) |
| Obstructed labour | 2.46 (2) | 6.06 (2) |
| Maternal exhaustion | 7.40 (6) | 21.21 (7) |
| Precipitate labour | 3.70 (3) | 9.09 (3) |
| Prolonged labour | 13.58 (11) | 24.24 (8) |
| Delivery mode | | |
| Vaginal (spontaneous) | 75.30 (61) | 72.72 (24) |
| Assisted vaginal | 8.64 (7) | 3.03 (1) |
| LSCS | 23.45 (19) | 24.24 (8) |
| Blood Loss in vaginal delivery (ml) | | |
| 300-500 | 74.07 (60) | 3.03 (1) |
| >500 | 3.70 (3) | 12.12 (4) |

Table 1: Maternal complications seen in the study subjects

| Variable | Severe anaemia % (n=81) | Very severe anaemia % (n=33) |
|--------------------------------|-------------------------|------------------------------|
| Puerperal complications | | |
| Wound gaping | 2.46 (2) | 12.12 (4) |
| Episiotomy | 2.46 (2) | 3.03 (1) |
| Lactation failure | 8.64 (7) | 15.15 (5) |
| Sub involution | 7.40 (6) | 18.18 (6) |
| Sepsis | 2.46 (2) | 6.06 (2) |
| Pyrexia | 7.40 (6) | 9.09 (3) |
| Mortality | 0 | 3.03 (1) |
| Morbidity | 27.16 (22) | 45.45 (15) |

Table 2: Puerperal complications and mortality seen in the study subjects

| Fetal outcomes | Severe anaemia % (n=81) | Very severe anaemia % (n=33) |
|-------------------------------------|-------------------------|------------------------------|
| Low birth weight <1000 gm | 7.40 (6) | 6.06 (2) |
| Neonatal Mortality | 1.23 (1) | 6.06 (2) |
| Neonatal Morbidity | 13.58 (11) | 24.24 (8) |
| Perinatal death | 2.46 (2) | 12.12 (4) |
| Complications | | |
| Congenital abnormalities | 0 | 0 |
| Birthaplasia | 1.23 (1) | 3.03 (1) |
| Sepsis | 1.23 (1) | 3.03 (1) |
| IUGR | 1.23 (1) | 0 |

Table 3: Fetal complications seen in the study subjects