



Research Article

MATERNAL AND FETAL OUTCOMES ASSOCIATED WITH SEVERE ANEMIA DURING PREGNANCY

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ABSTRACT

Introduction: Anemia during pregnancy, especially severe anemia, is associated with increased maternal morbidity and mortality. Fetal anemia, low birth weight (LBW), preterm birth and still birth have been associated with anemia. There is insufficient information to conclusively assess the effect of maternal anemia on maternal and perinatal outcomes. Furthermore, most studies were not able to study anemia according to its severity. Anemia is very much common in Northern India especially in Rajasthan. Hence we aimed to study the effect of severe maternal anemia on neonatal outcome. No such study has been undertaken in this part of the world

Objectives: To assess the effect of severe anemia during pregnancy and its relation to maternal and fetal outcome (with respect to the different morphological types of anemia).

Material & Method: This prospective study was carried out in the Department of Obstetrics and Gynecology, NIMS Medical College and Hospital, ShobhaNagar, Jaipur, Rajasthan from January 2014 to July 2015, over the period of 1.5 year. sample size was taken as 100. A thorough history will be elicited from these women to assess for exclusions chosen for study. The other complications associated with anemia will be noted. Subjects will be followed further by a thorough physical, systematic and obstetrics examinations as per the proforma prepared for the study

Conclusion: After analysis of the results and comparison with the reports of previous workers, it has been established in our study that Severe Anemia in pregnancy is directly associated with maternal and fetal adverse outcomes

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INTRODUCTION

Anemia in pregnancy is one of the most important public health problems not only in India but also in most of the South East Asian countries. About 16% to 40% of maternal deaths occur due to anemia. Anemia also increases maternal morbidity significantly. Pregnancy increases the requirements of various nutrients especially iron and folate and therefore puts a stress which will either precipitate or aggravate anemia in pregnancy. Hemodilution occurring in pregnancy is also a main factor to aggravate anemia. Anemia during pregnancy, especially severe anemia, is associated with increased maternal morbidity and mortality. Anemia during pregnancy is associated with a negative impact on both the women and neonate. Fetal anemia, low birth weight (LBW), pre-term birth and still birth have been associated with anemia. There is conflicting literature regarding the association between the anemia and perinatal outcomes. Some maternal recent studies^{1,2} have demonstrated a strong association between anemia and adverse perinatal outcomes such as pre-term

delivery and LBW, while other previous studies found no association³.

Therefore there is insufficient information to conclusively assess the effect of maternal anemia on maternal and perinatal outcomes. Furthermore, most studies were not able to study anemia according to its severity⁴. Anemia is very much common in Northern India especially in Rajasthan. Hence we aimed to study the effect of severe maternal anemia on neonatal outcome. No such study has been undertaken in this part of the world.

Objectives of the study

The objectives of the present study were

Primary

To assess the effect of severe anemia during pregnancy and its relation to maternal and fetal outcome (with respect to the different morphological types of anemia)

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Secondary

1. To reduce maternal mortality and morbidity.
2. To improve perinatal outcome and to reduce perinatal mortality and morbidity.

MATERIAL AND METHODS

Study Type: A Descriptive Type of Observational Study.

Study Design: Cross-sectional

Study Area: The study was conducted in the Department of Obstetrics and Gynaecology, National Institute of Medical Sciences (NIMS), Jaipur.

Study Duration: 1.5 year (from January 2014 to July 2015)

Study Population: 100 pregnant females with severe anemia fulfilling inclusion and exclusion criteria.

Selection Criteria

Inclusion Criteria

All pregnant women of gestational age > 28 weeks of gestation, of any parity with hemoglobin percent < 7 gm%.

Exclusion Criteria

1. Pregnant women with hemoglobin > 7gm.
2. Pregnancy with severe anemia due to acute hemorrhagic events like antepartum hemorrhage (abruptio placenta, placenta previa, molar pregnancy and ectopic pregnancy).
3. Past history of preterm delivery.
4. Obstetric complications or medical illnesses other than anemia.

Sample Size

Sample size was calculated by using formula $n=4pq/e^2$ (where p is probability of success, q is probability of failure and e is error of standardization). Accordingly sample size will be taken as 100.

Data Collection

Demographic data like age, obstetric history along with relevant history were recorded on predesigned and pretested proforma (Annexure-I).

METHODOLOGY

A thorough history will be elicited from these women to assess for exclusions chosen for study. The women will be interviewed in their language in full details regarding age, literacy, socioeconomic status, diet, parity, etc. Pregnancy details regarding ANC, significant past and family history will be noted. The other complications associated with anemia will be noted. Subjects will be followed further by a thorough physical, systematic and obstetrics examinations as per the proforma prepared for the study.

All the study subject will be carefully followed in the antepartum, intrapartum and postpartum periods. Enquiries will be made regarding new symptoms and women will be subjected to clinical examination to detect the complications of anemia at the earliest. Blood transfusion will be the commonest mode of treatment resorted in the severe anemia cases and will be one in antepartum, intrapartum and postpartum periods. Utmost care will be exercised to prevent the complications of blood transfusion. Blood components will be used in all the cases. These women, in labor will be carefully monitored and progress of labor noted, for any

obstetric or medical (CCF) complication will be carefully watched for.

The investigations done were:

1. Blood
 - Hb- quantitative estimation by Sahli's Hemoglobino meter method.
 - Complete blood picture
 - Peripheral smear for type of anemia
 - Hematocrit (PCV, MCV, MCHC)
 - Blood grouping and typing
 - Plateletcount
 - Random Blood Sugar
2. Urineroutine
3. Stool for occult blood, cyst/ova

Finally the mode of delivery, operative intervention, maternal, perinatal morbidity and mortality will be studied in all the study subjects. The perinatal outcome (live birth, still birth, intra uterine death, fetal growth restriction). The weight of newborns and their APGAR score at 1 and 5 min will be recorded. The neonate will be attended by the pediatrician to detect the complications of severe anemia. Outcome will be judged by analysis of above data. Equal attention will be given to the study subject during the post-partum period to detect the complications akin to severe anemia at the earliest. Breast feeding will be encouraged in immediate post-partum. Emphasis will be laid on maintenance of personal hygiene and early ambulation to avoid complications in puerperium. Parous women will be counseled regarding the need for sterilization and will be asked to follow up at a later date for the same. Primiparous will be explained the importance of spacing. Advice will be given regarding the need for continuous use of hematinics for minimum period of 6 months of post-partum. Cases will be followed up till they were discharged from the hospital.

Statistical methods employed

1. Percentage- a percentage is a number or ratio expressed as a fraction of 100.
2. Standard Deviation (SD)–
3. The formula for the standard deviation is as follows:
4. Chi-Square Test
5. Significant Figures

+ Suggestive significance (p value: 0.05 < p < 0.10)

* Moderately significant (p value: 0.01 < p < 0.05)

** Strongly significant (p value: p < 0.01)

OBSERVATION AND RESULTS

The data obtained was tabulated on Microsoft excel spread sheet and final results and observations were tabulated as below.

1. Majority (35%) of the study subjects belonged to the age group of 0-19 years. The minimum age in the entire study group was 16 years and the maximum age group was 40 years. 20% of the women were between 20-25 years, 27% of the women were between 25-29 years and 18% of the women were with age above 30 years.

2. 76% and 19% of women belonged to lower and middle socio-economic status group respectively. Almost all the anemic women belonged to the lower or middle socio-economic group, poor nutrition thus being the leading cause of anemia.
3. It was observed that percentage of anemia was more in the illiterate mothers (60%) as compared to literate mothers(40%).
4. Most of the study subjects (73%) belonged to the Ruralbackground.
5. 32% of cases were primi-gravida against 68% of cases, who were multigravida in the study subjects. Hence in the present study, majority of the anemic women were multigravida.
6. Mean spacing between births had an impact on the hemoglobin status of women. 60% of anemic women had birth spacing < 2 years. 40% of women had birth spacing > 2years.
7. 39% of women had significant past history and 61% of women did not haveany significant past history like previous LSCS, bad obstetric history, history of hypertension and epilepsy.
8. From the table, it can be seen that risk factors like pre eclampsia, PROM, oligohydramnios, Rh negative pregnancy, GDM, GHTN, hypothyroid, placentalaprevia and abruptio-placenta were seen in 45% of the cases while in 55% of the cases these risk factors were absent.
9. The Microcytic Hypochromic anemia was found in 74% and Dimorphic anemia was found in 23%. Megaloblastic anemia was found in 3% of the cases.
10. It is evident from the above table that the incidence of the low birth weight babies (birth weight < 2.5kg) was 59% in our present study.
11. In our study 53 female and 47 male children were born.
12. 59% of the women had regular menstrual flow, whereas 41% of the women had increased menstrual flow. In the present study, menstrual history was not significant. This could be probably due to inability of the women in the study group to reveal history clearly due to general ill health or lack of menstrual cycles with lactation amenorrhea continuing as pregnancy amenorrhea.
13. Out of the 100 women studied, majority (54%) were asymptomatic throughout pregnancy. (21%) developed palpitations, (8%) developed dyspnoea and (17%) developed both dyspnoea and palpitations.
14. In the present study, 74% cases delivered normally, 23% delivered by caesarean section and remaining 3% of the cases were delivered vaginally only after using any of the medical or surgical methods of induction.
15. 20% of the cases had Puerperal Sepsis in the post-partumperiod.
16. It is evident from the above table that the failure of lactation was found in 24% of cases in our present study.
17. In the present study 60 (60%) out of 100 women had full term deliveries and40 (40%) gone in to preterm deliveries. Among this 16 (16%) showed Intra-uterine growth restriction on ante-natal scan .7% of the study subjects had intrauterine death. Maternal complications were also seen in the form of congestive heart failure (10%), postpartum hemorrhage (5%), deep venous thrombosis (1%), dysfunctional labor (12%), respiratory and urinary tract infection (23%). There were two maternal deaths.
18. Pre-term babies (40%), IUGR (16%), NICU admission (28%) and intrauterine death (7%) were the important fetal outcomes in the anemic women. In (11%) of the cases APGAR Score was less than5.
19. Only 6 patients out of all dimorphic anemic patients and 31 out of all microcytic hypochromic anemic patients had abnormal urine routine examination with Chisqu are =3.697 with 2 degrees of freedom and P = 0.157 which suggests that abnormal urine routine examination has no statistically significant correlation with morphological type of anemia.
20. Our study confirmed that number of blood transfusions have no statistically significant correlation with morphological type of anemia. Chi-square =2.823 with 6 degrees of freedom; P = 0.831
21. 58.11% of all microcytic hypochromic, 33.33% of all macrocytic hypochromic and 65.22% of all dimorphic had low birth weight (<2.5 kg). Our study showed that there is no statistically significant correlation between low birth weight and morphological type of anemia. Chi-square =1.209 with 2 degrees of freedom; P = 0.546.
22. Out of all the maternal outcomes mentioned above only DVT had statistically significant correlation with morphological type of anemia. Rest of the maternal outcomeslikePPH,Dysfunctionallabor,RTI/UTI,CCF,Mo rality,PuerperalSepsis, Failure of lactation, IUGR, preterm birth and IUD had no statistically significant correlation with morphological type of anemia.
23. There were 7 IUD cases in our present study, which we analysed further ingreat detail. 71.42% of all the IUD cases had risk factors for severe anemia. 42.35% of all the IUD cases had significant past history. 71.42% of all the IUD cases were full term deliveries while 28.57% were pre-term deliveries. 28.57% of all the IUD cases had IUGR

DISCUSSION

Anemia in pregnancy is an important preventable cause of maternal and fetal morbidity and mortality. Studies have demonstrated differences in outcomes in iron deficiency as compared to physiological anemia of pregnancy. In India it is common to see patients with anemia, late in pregnancy with no prior antenatal care, especially in low socioeconomic settings. As it is estimated that about 7.3 million perinatal deaths occur annually in the world, mostly in developing countries, one could assume many of these deaths could be prevented by correcting maternal anemia.

CONCLUSION

Anemia in pregnancy is major health problem in developing countries like India. More than 2/3rd of pregnant women in India are anemic and most of the times it is due to iron deficiency and folic acid deficiency.

Anemia contributes to significant maternal mortality and morbidity. It causes direct as well as indirect maternal deaths from cardiac failure, infection, PPH, DVT and pre-eclampsia. In India anemia antedates pregnancy, is aggravated by increased demand during pregnancy and blood loss at delivery, infection in the antenatal and postnatal periods and early advent of next pregnancy perpetuates it.

Efforts therefore need to be directed not only to correct anemia but to prevent anemia. Early attention should be given to adolescent age group for better nutrition, education levels, delayed marriage not before 18 years and post-ponement of first pregnancy till 21 years of age. Awareness regarding dietary habits, small family norms, birth interval and regular ANC check-up and regular intake of iron.

After analysis of the results and comparison with the reports of previous workers, it has been established in our study that Severe Anemia in pregnancy is directly associated with maternal and fetal adverse outcomes.

Recommendations

From the review of literature, and observations of the study, following measures are recommended for reducing the problem of Severe Anemia and its harmful effects on maternal and fetal outcome.

1. Regular antenatal care: It allows early detection of risks factors for Severe Anemia and to take appropriate preventive measures.
2. Improvement in educational, socioeconomic and nutritional status: Bringing about health awareness among public, improving their living conditions, educational and socioeconomic status can in the long run reduce the incidence of Severe Anemia and thus reduce its harmful effects on maternal and fetal outcome.
3. Identification and treatment of risk factors: Identifying risk factors for Severe Anemia and treatment of factors amenable to treatment can reduce the incidence of Severe Anemia thus help in improving maternal and fetal outcome.
4. All pregnant women should be screened for anemia, and those with iron deficiency anemia should be treated with supplemental iron, in addition to prenatal vitamins.
5. Patients with anemia other than iron deficiency anemia should be further evaluated. Failure to respond to iron therapy should prompt further investigation and may suggest an incorrect diagnosis, coexisting disease, malabsorption (sometimes caused by the use of enteric coated tablets or concomitant use of antacids), noncompliance, or blood loss.

Limitations

1. Being a thesis work, this study was time bound and was on small number of subjects but the study observations are stimulating for a further major multi-centric comparative study of fetomaternal adverse outcome of severe anemia during pregnancy in general population. Sample size of 100 is too small to extrapolate the results on to the same.

2. As far as perinatal and neonatal complications are concerned, the rarity of some of the complications, made them difficult to evaluate in the present small study of limited sample size.
3. Although several confounding factors were evaluated, some might still have had an effect on the outcome results.
4. Although efforts were taken to eliminate confusion between LBW and IUGR babies but frequently these abnormalities co-exist.
5. The study being academic could not be further broad based with higher study group due to limitation of time and cost.

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Declarations

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