CASE REPORT

Hemolytic Anemia in Pregnancy: Fetomaternal Outcome

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Abstract

Objective: The aim of the study was to assess the fetomaternal outcome in hemolytic anemia.

Method: This study was an observational longitudinal study. Patients with hemolytic anemia were recruited from the antenatal clinic. Routine and special hematological investigations pertaining to hemolytic anemia were done. Blood was transfused with the aim to keep the Hb at 8 gm/dl or above. Maternal and fetal complications were studied.

Results: Pallor was the most consistently associated clinical feature in 29 of 37 cases (78%). The most common fetal complication in this study was low birth weight seen in 27 out of 37 cases (73%). Amongst the maternal complications, there were three cases of postpartum hemorrhage and two cases of wound infections.

Conclusion: With regular antenatal care, adequate blood transfusion and efficient supervision from the hematology unit, the prognosis of pregnancy in hemolytic disease is not as grave as it was in the past. Expectation to have a family is an important aspiration for a better quality of life for the women with hemolytic anemia.

Keywords: Hemolytic anemia, Thalassemia, Sickle cell anemia.

INTRODUCTION

Anemia is one of the most frequent medical complications related to pregnancy. Hemolytic anemia is a rare form of anemia, which arises due to the shortened survival of red blood cells because of inherent abnormalities of the cell, environmental factors or both. Pregnancy associated with this wide spectrum of hemolytic anemias is of special significance as the incidence of this disease is higher in many parts of India. This topic is also significant because concepts like preconceptional genetic counseling and genetic screening coupled with effective medical strategies offer immense scope to keep an effective check on this spectrum of diseases.

Hemolytic anemia in pregnancy had been a nightmare for the obstetricians all over the globe since a long time. But with latest advances in concepts like genetic screening and prenatal genetic counseling, the prognosis of these spectrum of diseases has improved dramatically. The recent advances in the management options available and improved antenatal monitoring, excellent intrapartum and postpartum care have also contributed effectively to improve the outlook of hemolytic anemia in pregnancy. The aim of the study was to assess the obstetrical prospects in hemolytic anemia.

MATERIALS AND METHODS

The study was performed in the Department of Obstetrics and Gynecology, Medical College, Kolkata from 1st June 2007 to 31st May 2009. As this is a tertiary referral hospital and since Institute of Hematology and Transfusion Medicine at Kolkata Medical College is the apex nodal center for hematology at Kolkata, mothers with hemolytic anemia are referred to this Institute for expert management. The study population included all antenatal mothers with hemolytic anemia in pregnancy attending the antenatal clinic of Eden Hospital.

Inclusion Criteria

Antenatal mothers with diagnosed hemolytic anemia.

Exclusion Criteria

Associated medical disorders, e.g. heart disease, endocrinological disorder, severe infections.

Study Design

This study was an observational longitudinal study. Patients were recruited from the antenatal clinic. Antenatal mothers fulfilling inclusion criteria and exempted from the exclusion criteria were included in the study. A consent form was signed by them before recruitment. On first visit to antenatal clinic, proper history of the mother, including age, parity, years of marriage, occupation, socioeconomic condition, menstrual history, obstetric history, past history of medical disorder, surgical intervention, personal history and history of blood transfusion were recorded in detail. General, systemic examination and obstetric examination were done.

The mothers were subjected to routine investigations and specific hematological investigations. Services were sought in the form of:

1. Routine antenatal investigations
2. Special hematological investigations from Institute of Hematology and Transfusion Medicine, Medical College, Kolkata, which included serum ferritin, indirect Coombs' test, reticulocyte count, MCV, MCH, MCHC.

Type of hemolytic anemia, medications and necessary investigations were reviewed in consultation with the hematologist. On each visit to antenatal clinic, the mothers were reviewed with regard to maternal and fetal condition. Maternal features recorded were weight gain in last 2 to 4 weeks, blood pressure, pallor, icterus and hepatosplenomegaly. Specific investigations mentioned above were also reviewed. If the hemoglobin levels were reduced or if there were any other serious complications, the mothers were admitted in the hospital. Fetal conditions were assessed with regard to increase in fundal height and abdominal girth, ultrasound monitoring for proper dating and assessment of fetal growth to rule out growth restriction or any other congenital abnormalities.

Patients were admitted when they were at term or earlier if there were any complications or if blood transfusion was required. Rapid assessments of maternal and fetal conditions were done. Mothers with no obstetric indications were allowed to go for spontaneous vaginal delivery. Cesarean section was performed only when obstetrically indicated. During labor, they were closely monitored and maternal and fetal outcome was studied.

Strict monitoring of the maternal and fetal condition was done during labor. After delivery, the newborns were assessed by the pediatrician and mothers were encouraged breast feeding as soon as possible. In cases of uneventful labor and puerperium, mothers were discharged within two days of vaginal delivery and five days of cesarean section. Blood was transfused if hemoglobin was found to be < 8 gm/dl and hemoglobin status of mothers at time of discharge was recorded.

RESULTS

Table 1 shows that majority of the women were in the 20 to 25 years age group (48.6%).

Table 2 shows the distribution of cases according to the type of hemolytic anemia. Out of the 37 mothers with hemolytic anemia, majority of the cases were β-thalassemia traits and Eβ-Thalassemia, both 15 cases each and together comprising 81% of the total cases. There were two cases each of Hb-E carriers and Sickle β-thalassemia. One mother each had Hb-E disease, β-thalassemia major and hereditary spherocytosis.

It is evident from Table 3 that Pallor was the most consistently associated clinical feature in 29 of 37 cases (78%). Nine patients had a typical thalassemic facies and 17 cases were icteric. Due to the rapid destruction of the red blood cells, hepatosplenomegaly is a common association and in 10 cases, a palpable liver was seen and in 18 cases, spleen was palpable. 19 out of 37 cases were given blood transfusions during the antenatal period. 21 out of 37 cases were given blood transfusions during the postnatal period.

The Hb% of the mother at the first visit and at delivery was noted and the number of units of blood transfused were recorded in Table 4.

Maternal and fetal complications have been reflected in Table 5. Among the postpartum complications, there were three

Table 1: Distribution according to age and gravida

Age in years	*No. of cases (n = 37)*	*Percentage (%)*
15-20	4	10.8
20-25	18	48.6
25-30	11	29.7
30-35	4	10.8
Gravida		
Primigravida	23	62.2
Multigravida	14	37.8

Table 2: Distribution of women according to type of hemolytic anemia

Type of hemolytic anemia	*No. of cases (n = 37)*	*Percentage(%)*
β-thalassemia carrier	15	40.5
Eβ-thalassemia	15	40.5
Hb-E Disease	1	2.7
Hb-E Carrier	2	5.4
β-thalassemia major	1	2.7
Hereditary spherocytosis	1	2.7
Sickle β-thalassemia	2	5.4

Table 3: Clinical features

Findings	*No. of cases (n = 37)*	*Percentage(%)*
Pallor	29	78.4
Icterus	17	45.9
Thalassemic facies	9	24.3
Palpable liver	10	27
Palpable spleen	18	48.6

Table 4: Distribution of cases according to hemoglobin status of mother at first visit and at delivery and blood units transfused antepartum and postpartum

Hemolytic status of mother	*Hemoglobin % at first visit*	*Hemoglobin % at delivery*	*Blood transfusion (Antepartum/postpartum)*
β-thal 1	11.7	11.0	0/0
β-thal 2	5.7	7.8	0/2
β-thal 3	4.2	3.4	2/3
β-thal 4	10.0	10.0	0/0
β-thal 5	6.2	6.2	0/1
β-thal 6	7.9	8.3	0/0
β-thal 7	9.9	8.6	0/0
β-thal 8	7.8	9.1	0/0
β-thal 9	9.5	6.1	2/2
β-thal 10	7.4	9.2	9/1
β-thal 11	9.2	9.2	0/0
β-thal 12	8.4	9.2	0/0
β-thal 13	9.1	8.5	0/0
β-thal 14	8.8	8.8	0/2
β-thal 15	6.8	8.2	2/1
β-thal major	7.6	5.5	8/2
Eβ-thal 1	7.0	6.5	2/1
Eβ-thal 2	8.7	7.4	0/3
Eβ-thal 3	7.2	7.2	4/2
Eβ-thal 4	7.4	7.4	0/0
Eβ-thal 5	4.4	4.1	12/1
Eβ-thal 6	3.4	9.0	8/2
Eβ-thal 7	5.4	7.4	2/1
Eβ-thal 8	9.2	7.5	3/1
Eβ-thal 9	7.8	8.0	0/0
Eβ-thal 10	6.0	9.0	3/0
Eβ-thal 11	5.2	7.7	9/0
Eβ-thal 12	3.0	4.0	4/3
Eβ-thal 13	3.2	9.0	13/2
Eβ-thal 14	4.2	7.2	3/1
Eβ-thal 15	4.7	6.8	20/1
Hb-E carrier 1	9.9	9.9	0/0
Hb-E disease 1	9.6	8.5	0/0
Hb-E carrier 2	14.9	12.5	0/1
Sickl B Thal 1	10.5	8.6	1/0
Sickl B Thal 2	9.5	9.5	5/0
Hereditary spherocytosis	9.5	11.1	0/1

cases of postpartum hemorrhage and two cases of wound infections. Fetal complications are yet another important variable being assessed in this study. The fetal complications include low birth weight, birth asphyxia, neonatal-Jaundice, septicemia and stillbirths. Out of the 37 women under study, one was a twin pregnancy and another triplet so the total number of babies were 40. The most common fetal complication in this study was low birth weight seen in 27 out of 40 newborn (67.5%). Nine babies had birth asphyxia and there was neonatal jaundice in three cases. Six babies had neonatal septicemia and were managed with antibiotics in the newborn nursery. There were three stillbirths (all three cases of gross IUGR).

Table 5: Maternal and fetal complications

Maternal complications	*No. of cases (n = 37)*	*Percentage (%)*
Obstetric complications		
Anemia	29	78.4
Jaundice	17	45.9
PIH	1	2.7
Hbsag +ve	1	2.7
HIV positive	1	2.7
Postpartum complications		
PPH	3	8.1
Wound infections	2	5.4
Fetal complications	*No. of cases (n = 40)*	*Percentage (%)*
Low birth weight	27	67.5
Birth asphyxia	9	22.5
Jaundice	3	7.5
Septicemia	6	15.0
Stillborn	3	7.5

DISCUSSION

Hemolytic anemia in pregnancy continues to be a major health problem especially in developing countries and is associated with significant maternal and perinatal mortality and morbidity. The likelihood of an adverse effect on maternal and fetal outcome

is related to the type and severity of hemolytic anemia, time of presentation, management options and resulting abnormalities encountered during labor.

Traisrisilp K[1] et al carried out a study of pregnancy outcomes in women complicated by thalassemia syndrome at Maharaja Nakorn Chiang Mai Hospital Thailand. In their study, the mean gestational age (+/-SD) at delivery was 37.40 (+/-2.6) weeks, range 27 to 42 weeks. Twenty five (32.5%) had delivery by cesarean section and the remainder had successful vaginal delivery. Fetal growth restriction was found in 21 cases (27.3%), 16 (20.8%) had preterm births and the rate of low birth weight (< 2,500 gm) was 44.1%. Regard to the type of thalassemia, baseline hemoglobin levels and mean birth weight of women with beta-thal/Hb-E was significantly lower than the levels of those with Hb-H disease. They concluded that inspite of an attempt to keep hemoglobin levels above 7.0 gm/dl, pregnancy with thalassemia is likely to be associated with an increased rate of fetal growth restriction, preterm birth and low birth weight. In our study in 29 out of 37 cases (78%), the pregnancy progressed upto term. But in eight cases (21.6%), the deliveries were preterm and thereby adding onto the poor neonatal outcomes and neonatal mortalities. The most common fetal complication we noted was low birth weight in 27 out of 37 cases (67.5%). Bajoria et al[2] observed that the incidence of preterm labor and growth restriction were 3 fold higher than the background population. However Origa[3] et al reported from an Italian multicenter experience that the proportion of babies with intrauterine growth retardation did not differ from that reported in the general Italian population. They observed that provided a multidisciplinary team is available, pregnancy is possible, safe and usually has a favorable outcome in patients with thalassemia.

In the normal electrophoresis, Hb-E is absent. It is seen in electrophoretic picture of patients with Eβ-thalassemia, Hb-E disease and Hb-E carrier. In our study it was seen that Hb-E was consistently and significantly elevated in patients with all 15 out of the 15 cases of Eβ-thalassemia. Hb-E was also elevated in mothers with Hb-E disease (1 out of 1 case) and Hb-E carrier (2 out of 2 cases). Hb-F is between 0.2 to 0.8% in normal electrophoresis report. We found that Hb-F was elevated in β-thalassemia major and in seven out of 15 cases in β-thalassemia trait. Hb-F was found to be significantly and highly elevated in all cases of Eβ-thalassemia and all cases of Sickle β-thalassemia. Hemoglobin status of every mother was observed carefully to have an idea regarding the severity of anemia. The ICMR classification[4] of the severity of anemia is as follows: Hemoglobin < 4 gm/dl-very severe anemia; Hemoglobin 4 to 7 gm/dl-severe anemia; Hemoglobin 7-10 gm/dl-moderate anemia; Hemoglobin 10-10.9 gm/dl-mild anemia.The distribution of women with respect to the hemoglobin of every antenatal mother at their first visit and at delivery was studied. Three patients had very severe anemia at first visit and one patient had very severe anemia after delivery. Nine patients had severe anemia at first visit and seven patients had severe anemia after delivery. 21 patients had moderate anemia at first visit and 25 patients had moderate anemia after delivery. Two patients had mild anemia at first visit and one patient had mild anemia after delivery. The majority of patients had moderate anemia with hemoglobin in the range between 7 gm/dl and 10 gm/dl.

Two decades before we could never have thought or expected women having hemolytic anemias entering into marital life, planning families, getting pregnant and raising children of their own because their life expectancy was limited. But the advent of chelating agents, improvement of blood transfusion facilities and establishment of super speciality care have changed the horizon thus creating another corner in the domain of antenatal care, i.e. pregnancy with hemolytic anemia. With regular antenatal care, adequate blood transfusion and efficient supervision from the hematology unit the prognosis of pregnancy in hemolytic disease is not as gloomy as it was in the past. During the course of the study, we have observed and realized the fact that the concept of safe motherhood can also be extrapolated to these women and they can also be showered with the blessings of motherhood.

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