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FETO-MATERNAL OUTCOMES OF RARE HAEMATOLOGICAL DISORDERS IN PREGNANCY

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ABSTRACT

Background: Rare haematological disorders in pregnancy pose significant risks to both the mother and fetus due to haemostatic and hematologic challenges. Objective: To study the etiology, clinical presentation, and feto-maternal outcomes of rare haematological disorders during pregnancy. Methods: This prospective observational study was conducted over one year (October 2023–2024) at a tertiary care hospital and included 20 antenatal women diagnosed with rare haematological disorders, excluding nutritional anemia and gestational thrombocytopenia. Maternal and neonatal outcomes were assessed. Results: Among 6,400 pregnant women, the incidence of rare haematological disorders was 0.3%. The most common disorders were β-thalassemia trait (55%), immune thrombocytopenic purpura (20%), and pancytopenia (15%). Blood transfusion was required in 70% of cases, and postpartum hemorrhage occurred in 35%. Fetal complications included low birth weight (35%), meconium aspiration (40%), and intracranial hemorrhage (10%). Half of the neonates required NICU admission. Conclusion: Early diagnosis and multidisciplinary management are crucial to reduce maternal morbidity, peripartum hemorrhage, and adverse neonatal outcomes in pregnancies complicated by rare haematological disorders.

KEYWORDS: pregnancy, rare haematological disorders, feto-maternal outcomes, thalassemia, immune thrombocytopenic purpura, von Willebrand disease, postpartum haemorrhage.

INTRODUCTION

Pregnancy causes certain physiological changes that affect the haematological indices either directly or indirectly. Women with inherited haematological disorders are also at increased risk of morbidity and mortality due to haemostatic challenges during pregnancy. Maternal haematological disorders also cause significant adverse fetal and neonatal outcomes.[1] There is evidence of adverse neonatal outcomes such as developmental delay, cognitive and motor impairment and even cerebral palsy due to oxidate stress, inflammation and hypoxia.[1]

Anaemia secondary to iron deficiency is the most frequent hematologic complication and affects about 42% of all pregnancies and thrombocytopenia is the

second most common and affects about 8% of all pregnancies.[2,3] They have a wide range of etiology that needs prompt diagnosis. Congenital and acquired bleeding disorders not only increase risk of antepartum and postpartum bleeding in the mother, but can also cause intracranial haemorrhage in the fetus.[4]

Haematological changes during pregnancy

- Plasma volume rises by 10-15 % at 6-12 weeks of gestation and reaches 30-50% at term. Red blood cell volume rises by 20-30 % at term.[5] Due to higher increase in plasma volume the hemoglobin levels fall resulting in physiological anaemia.
- Leucocytosis also occurs due to immunological changes induced by pregnancy.
- Platelet count also decreases during pregnancy mainly in the third trimester partly due to hemodilution[6] and partly due to its increased activation and increased clearence causing gestational thrombpcytopenia .
- Fibrinogen and clotting factors 7,8,10,12,von willebrand factor increases as pregnancy progresses resulting in hypercoaguable state.[7]

Pregnancy outcomes

Iron deficiency anaemia and thrombocytopenia are most prevalent hematological disorders of pregnancy. Thrombocytopenia in pregnancy can be due to various etiologies such as gestational thrombocytopenia, immune thrombocytopenic purpura, thrombotic thrombocytopic purpura, pre-eclampsia and HELLP. These are associated with increased blood loss and other complications and thus require immediate treatment.[8]

Apart from the above mentioned disorders, the rare hematological disorders that ate encountered during pregnancy include autoimmune hemolytic anaemia, aplastic anaemia, sickle cell anaemia, thalessemia and bleeding disorders. These requires multidisciplinary approach to manage the adverse maternal and fetal outcomes.[8]

Bleeding disorders such as von Willebrand disease and hemophilia poses increased rise of postpartum hemorrhage and fetal coagulopathy.

Immune thrombocytopenic purpura (ITP) is the most common etiology of low platelet count in early pregnancy and affects 1-4% of all pregnancies. Risk of postpartum hemorrhage is higher in patients with ITP ranging from 2-13%. Neonates born to mother with ITP can develop neonatal thrombocytopenia, risk being 8-37.5% which can lead to serious complication such as intracranial hemorrhage (<1%).[9]

Von Willebrand disease is the most common inherited bleeding disorder which occur due to the deficiency or dysfunction of the von Willebrand factor. This results in bleeding episodes due to impaired platelet adhesion or factor 8 deficiency. Patients with this disease are at increased risk ofantepartum hemorrhage, primary postpartum hemorrhag, birth related bleeding and need for blood transfusions within 24 hrs of delivery. Neonates are at increased risk of scalp hematoma and intracranial hemorrhage.[10]

The wide range of inherited and acquired haematological disorders not only affect the maternal health but also have a great impact on the fetus and newborn. These need early identification and prompt management to reduce the burden of the disease. Our study aims at identifying the etiology and feto maternal outcomes of rare haematological disorders.

AIMS AND OBJECTIVES

To study the etiology, clinical presentation and feto-maternal outcomes of rare haematological disorders in pregnancy.

MATERIALS AND METHODS

A prospective observational study was conducted in a tertiary care hospital for 1 year (October 2023-24). All antenatal women attending the antenatal OPD or getting admitted in the labour room were included in the study after informed consent. Women with nutritional deficiency anaemia, gestational thrombocytopenia, thrombocytopenia secondary to pre-eclampsia or HELLP syndrome and thrombocytopenia secondary to DIC were excluded. 20 patients with rare inherited haematological disorders were included in the study. After clinical and physical examinations, relevant biochemical investigations were sent. Antenatal and postnatal assessments were done for maternal outcomes. Also fetal and neonatal outcomes were also noted.

OBSERVATIONS AND RESULTS

Table 1: Demographic details of patients.

Patients characteristics	N=20	Mean ± SD
Age (years)		26.45 ± 4.8
Period of gestation (weeks)		38.57 ±1.05
Hemoglobin level (g/dl)		9.31 ± 1.91
Age (years)		**PERCENTAGE**
19-23	5	25%
24-28	10	50%
29-33	3	15%
34-38	2	10%

Socio-economic status		
Upper middle	3	15%
Lower middle	11	55%
Upper lower	5	25%
Lower	1	05%
Obstetric history		
Primigravida	10	50%
Multigravida	10	50%
Type of disorders		
Bleeding disorder	3	15%
Coagulation disorder	1	05%
Hemoglobinopathy	11	55%
Haemolytic disorder	1	05%
Platelet dysfunction	4	20%
Previous history of blood transfusion	7	35%
Pallor	14	70%
Edema	6	30%
Ultrasonography		
Normal	11	55%
hepatosplenomegaly	4	26.67%

Among 6400 pregnant women admitted, the incidence of all haematological disorders was 2.3 % (n=152), with 20 cases being of rare disorders. Of these, 11 (55%) were beta thalassemia trait, 4(20%) were Immune thrombocytopenic purpura, 3 (15 %) were pancytopenia and 1 (5%) each of von Willebrand disease and hereditary spherocytosis. The mean age and period of gestation of the patients were 26.45 ± 4.8 years and 38.57 ± 1.05 weeks respectively.

Table 2: Maternal Outcomes.

Antenatal complications	**N=20**	**Percentage**
Fetal growth restriction	8	40%
Antepartum hemorrhage	1	05%
Blood transfusion	7	35%
Mode of delivery		
Normal vaginal delivery	11	55%
Cessarean section	9	45%
Postpartum hemorrahage	7	35%
Need for blood products	14	70%
Postpartum complications		
Fever	3	15%
Intraperitoneal hematoma	1	5%
Rectus sheath hematoma	1	5%
Vulval hematoma	1	5%
Duration of hospital stay		
<1 week	11	55%
1-2 weeks	8	40%
>2weeks	1	05%

Antenatally, 7 (35.00%) patients required blood transfusion, and 1 (5.00%) patient had an episode antepartum haemorrhage at 13 weeks of gestation which was managed conservatively. Mode of delivery was vaginal in 11 (55.00%) cases and LSCS in 9 (45.00%) cases. All caesarean sections done were due to obstetrical indications.

Post partum complications

Postpartum haemorrhage occurred in 7 (35.00%) patients and 14 (70.00%) patients were transfused blood products in the intrapartum and postpartum period. 3(15.00%) patients had fever episodes post delivery and were managed conservatively.

1(5%) developed intraperitoneal hemorrhage and sepsis on post delivery day 1. The patient was disgnosed with bleeding disorder (bicytopenia-anaemia and

thrombocytopenia) during her antenatal period. Patient received blood and blood products along with vitamin b12 injections pre delivery. Patient underwent ceasarean section in view of meconium stained liquor with fetal distress. On day 1 of delivery, she developed fever for which she was investigated and ultrasound abdomen pelvis was also done to look for septic focus which showed intraperitoneal hematoma of size 3*3 cm. Antibiotics were upgraded and 2 packed cell blood, 6 platelets and 6 fresh frozen plasma was transfused. Patient was discharged with stable condition on day 4.

1(5%) developed rectus sheath hematoma on day 1 of delivery. Patient was known case of Von willebrand disease with factor 8 deficiency sice. Patient had received factor 8 and multiple blood products during her previous pregnancy. Hematology referral was done during her antenatal period and patient was induced in view of post datism. 1 packed cell volume (PCV) and 8 cryoprecipitate were transfused during first stage of labour. Patient underwent ceasarean for fetal distress. On post operative day 1, patient had bleeding from stich line. After arrange adequate blood and blood products, was taken for exploratory laparotomy .30 cc subcutaneous hematoma was drained and few oozers were present which were cauterisied. Hemostasis was achieved and patient was shifted to High Dependency Unit (HDU) for monitoring. 1 packed cell volume, 2 fresh frozen plasma and 2 cryoprecipitate were transfused post delivery. Patient then developed surgical site infection which was managed and patient was discharged on day 23.

1(5%) developed vulval hematoma within few hours of delivery. The patient was diagnosed with immune thrombocytopenic purpura during antenatal period. Patient went induced at term for fetal growth retardation and was transfused 1 PCV and 8 platelets as her platelet count on admission was 10,000. Patient delivered a female baby of weight 2080 grams via normal vaginal delivery without episiotomy or tear. Patient developed a spontaneous 5*4 cm left vulval hematoma within 3 hours of delivery which was drained in the operation theatre and 1 PCV and 4 platelet was transfused. Patient was shifted to HDU for monitoring and discharged on day 12 as baby was in NICU for low birth weight.

Table 3: Fetal outcomes.

Birth weight		
Normal (>2.5kg)	13	65%
Low birth weight(<2.5kg)	7	35%
Meconium aspiration syndrome	8	40%
Intracranial hemorrhage	2	10%
Nicu admissions	10	50%
APGAR at 0		
<9	5	25%
9	15	75%

Half of the babies required NICU admission for more than 24 hours. Meconium stained liquor was present in 8 babies (40.00%). Intracranial haemorrhage was found in 2 (10.00%) neonates. Mean values for APGAR scores at 0, 1, 5 minutes and were 8.45 ± 1.23, 8.85 ± 0.49, 8.95 ± 0.22. Three (15%) babies had a poor APGAR score and did not cry immediately after birth. The mean birth weight was 2675 ± 434 grams.

DISCUSSION

The mean age of the patients in the present study was 26.45 years, which is similar to a study conducted by Bakhsh et al. with mean age of 28.5 years.[1] In the present study, the mean gestational age at delivery was 38.57 ± 1.05 weeks, as compared to 39 ±1.5 weeks in this study.

In this study, 11 (55%) were beta thalassemia trait, 4(20%) were Immune thrombocytopenic purpura, 3 (15 %) were pancytopenia and 1 (5%) each of von Willebrand disease and hereditary spherocytosis. In a study conducted by Bakhsh et al, 40% had iron deficiency anaemia, 20% had sickle cell anaemia,20% had thalassemia and 20% had hemophilia.[1]

5% had antepartum hemorrhage, 35% required blood transfusion antenatally, LSCS in 45% cases35% had PPH, 70% needed blood transfusion postnatally in this study. In the study (11), antepartum hemorrhage was reported as 1.3% and 7.29% had PPH. In the study conducted by Guillet S et al, 21.1% had antepartum hemorrhage, 23.1% had ceaserean section, 43% needed blood transfusions.[12]

In a study conducted by Bakhsh et al, majority of newborns(10%) had Apgar scores of 7–9 at both 1 min and 5 min[1.] 15% had low Apgar scores and 50% required NICU admission in our study.

In the study conducted by Guillet S et al, 171 babies born to mothers with ITP were followed upto 6 months after birth.[12] Two neonates had bleeding events complicated by thrombocytopenia, out of which one died of intracranial hemorrhage and one was managed by platelet and IVig transfusion. In the present study, intracranial hemorrhage was seen in 2 babies (10%) who required NICU admission.

CONCLUSION

Timely diagnoses and management with regular antenatal care and monitoring is key to prevent adverse feto-maternal outcomes.

There is significant risk of maternal morbidity and mortality due to increased risk of postpartum haemorrhage and haemostatic challenges which need prompt management.

It is also important to be aware of potential long-term consequences in newborns and to monitor for developmental delays and other neurological problems in children born to affected mothers.

These patients require pre-conceptional counselling and need management at a higher care centre by a multidisciplinary team.

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