

ORIGINAL ARTICLE

Thrombocytopenia in Neonates Undergoing Exchange Transfusion of Blood for Severe Neonatal JaundiceSABA BAKHT¹, SOHAIB RIAZ², NIDDA AYUB³, SYED KHURRAM SAJID⁴¹Assistant Professor, Pediatrics Akhtar Saeed Trust Hospital Lahore²Assistant Professor of Pediatrics, Madinah teaching hospital Faisalabad³Senior demonstrator Sharif Medical and Dental college, Lahore⁴FCPS (Pediatrics) Medical Officer, Pediatrics, Civil Hospital, KarachiCorresponding author: Syed Khurram Sajid, Email: drskhurrans@gmail.com**ABSTRACT****Objective:** To determine the frequency of thrombocytopenia in neonates undergoing exchange transfusion of blood for severe neonatal jaundice.**Methodology:** Total 200 neonates fulfilling the selection criteria were included in the study from neonatology unit, The Madinah Teaching Hospital Faisalabad during Nov, 2020 to October 2022. An informed consent was taken from parents. Demographic information (name, age, gender, and contact) was obtained. Then all neonates underwent exchange transfusion under standard procedure. After exchange transfusion 3cc Blood sample was obtained with the help of a staff nurse by using butterfly needle and 5cc BD syringe under aseptic measures. Sample was sent to the laboratory of the hospital for platelet count. If platelet count was found below 100,000/dL, thrombocytopenia was labelled (platelet count in complete blood count is <100,000/dL assessed at the end of exchange transfusion).**Results:** In our study, the mean age of the patients was calculated as 15.17±4.85 days. Gender distribution reveals that 94(47%) were male and 106(53%) were females. Frequency of thrombocytopenia in neonates undergoing exchange transfusion of blood for severe neonatal jaundice was recorded in 15(7.5%) of the cases, and among them 7(46.7%) were between 1-14 days and 8(53.3%) were between 15-28 days of life, p-value=0.533, regarding gender 5(33.3%) were male and 10(66.7%) were females, p-value=0.203.**Conclusion:** We found that the rate of thrombocytopenia in neonates having blood exchange transfusion for severe neonatal jaundice was not significantly greater than the rate in other studies. However, our results are from a single site and need to be confirmed by additional multicenter local investigations.**Keywords:** Severe neonatal jaundice, exchange transfusion of blood, thrombocytopenia**INTRODUCTION**

Hyperbilirubinemia is one of the clinical disorders that may be seen most often in¹ During the newborn era, particularly in the first week of life, neonatal hyperbilirubinemia is a frequent clinical issue that may be seen.²⁻³ Hyperbilirubinemia affects anywhere between 8 and 11 percent of newborns. During the first week of a newborn's life, total serum bilirubin (TSB) will be deemed to have hyperbilirubinemia if it reaches a level that is more than the 95th percentile for its age (the high-risk zone).⁴⁻⁵

In the first week after birth, clinical jaundice affects approximately 60% of full-term infants and 80% of preterm infants; however, only 0.02 to 0.16% of infants develop severe hyperbilirubinemia (Total serum bilirubin (TSB) >25g/dL). This condition is considered a medical emergency because it can lead to neonatal bilirubin encephalopathy, which can cause death or irreversible brain damage.⁶

Exchange transfusion is the process of removing blood from a child that has high levels of bilirubin and/or antibody-coated red blood cells (RBCs) and replacing it with blood from a fresh donor (ET). It is utilised in cases where hyperbilirubinemia continues to be present even after intensive phototherapy, and it is of particular benefit in situations where there is substantial hemolysis. Regardless of the amount of bilirubin in the patient's system at the time, ET may also be utilised to treat mild to severe acute bilirubin encephalopathy (ABE).⁷⁻⁸ Despite the fact that the incidence of neonatal ET has significantly decreased over the past two decades as a result of the widespread use of intensive phototherapy, anti-D prophylaxis for Rh-negative mothers, the use of IVIG in infants with hemolysis, and advancements in prenatal and postnatal care, this procedure is still performed in many countries, particularly in those with a high incidence of severe hyperbilirubinemia.⁹⁻¹¹ However, it can lead to various complications like transitory hypocalcemia, hyperkalemia, bradycardia, thrombocytopenia, life-threatening bleeding, infection, cardiac arrhythmias, and even death.¹²⁻¹³

Adverse events associated with blood exchange transfusions can arise from a variety of different factors, including but not limited to changes in blood volume and blood pressure, changes in acid-base status, changes in platelet count due to the

use of packed red cells (which lack platelets and coagulation factors), electrolyte abnormalities, and the introduction of infectious pathogens (AEs). Blood transfusions, commonly known as blood exchange transfusions (BETs), are a common medical procedure. Despite BET's status as a significant operation on par with major surgery, there is a paucity of reliable data on the frequency of its associated morbidities. Most of the studies that have been conducted and published are retrospective, have variable follow-up durations, and employ different definitions of adverse events (AEs).¹⁴⁻¹⁵ When comparing older treatment methods to newer ones or assessing potential enhancement tactics, it is crucial to have reliable information on AEs, using established definitions.

Because of this, we prospectively evaluated the occurrence of clinical, biochemical, haematological, and radiological AEs, including severe AEs (SAEs), within 14 days after BET for hyperbilirubinemia in newborns, making use of established criteria.

METHODOLOGY

Two hundred infants aged 1–28 days diagnosed with severe newborn jaundice required exchange transfusion were enrolled in the trial, whereas neonates with polycythemia (Hb>16.5g/dl), anaemia (Hb10g/dl), Thrombocytopenia (platelet 15000 cell/m3), preterm neonates (gestational age 37 weeks as per mother's antenatal record), thrombocytopenia before exchange transfusion, and neonates with comorbid conditions that can cause thrombocytopenia, such as sepsis (TLC).

RESULTS

In our study, the mean age of the patients was calculated as 15.17±4.85 days. Gender distribution reveals that 94(47%) were male and 106(53%) were females. Frequency of thrombocytopenia in neonates undergoing exchange transfusion of blood for severe neonatal jaundice was recorded in 15(7.5%) of the cases, and among them 7(46.7%) were between 1-14 days and 8(53.3%) were between 15-28 days of life, p-value=0.533, regarding gender 5(33.3%) were male and 10(66.7%) were females, p-value=0.203.

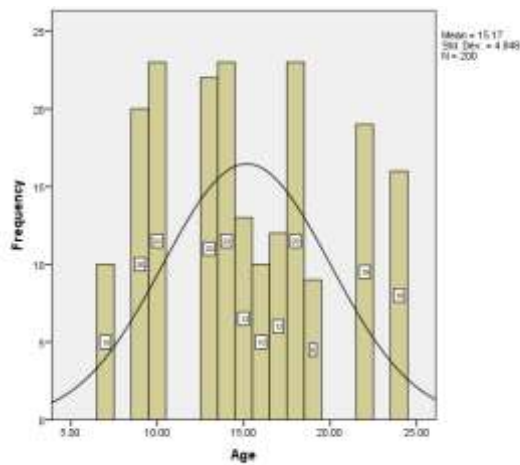


Figure 1:

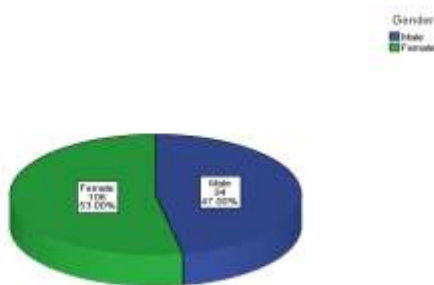


Figure 2: Gender distribution

Table 1: Frequency of Thrombocytopenia in Neonates Undergoing Exchange Transfusion of Blood for Severe Neonatal Jaundice

Variable	Thrombocytopenia(n=15)		P value
	Yes	No	
Age	1-14 days	7(46.7%)	0.533
	15-28	8(53.3%)	
Gender	Male	5(33.33%)	0.203
	Female	10(66.7%)	

DISCUSSION

The purpose of this research was to quantify the incidence of thrombocytopenia among infants who had blood exchange transfusions to treat severe newborn jaundice. Thrombocytopenia is a frequent complication of exchange transfusions in newborns, according to clinical observations. The most often seen symptom is a decrease in platelet count (thrombocytopenia). Patechie, bruises, and even cerebral haemorrhaging may result from a lack of coagulation factors in the blood. There are discrepancies in the reported prevalence of thrombocytopenia after exchange transfusion in infants with jaundice. Since no local data was identified in literature to aid in the formulation of a preventative and treatment strategy for thrombocytopenia and related consequences in neonates, we want to validate the problem's scope in the local community via this research. This will help us provide better care while reducing stress on both hospitals and parents.

In our study, the mean age of the patients was calculated as 15.17±4.85 days. Gender distribution reveals that 94(47%) were male and 106(53%) were females. Frequency of thrombocytopenia

in neonates undergoing exchange transfusion of blood for severe neonatal jaundice was recorded in 15(7.5%) of the cases.

Comparable to our findings is a research from India that found the incidence of thrombocytopenia to be 6.4% following exchange transfusion in infants with severe hyperbilirubinemia.¹⁶ The incidence of thrombocytopenia was twice as high in a research done in Dhaka, Bangladesh, as it was in ours or the preceding one.¹⁶

Another research found that following exchange transfusion, only 17.6% of newborns with severe hyperbilirubinemia had thrombocytopenia. This study was also done in Hamadan, Iran, at the Hamadan university of medical sciences.¹⁸ When compared to our research, this represents a greater risk of morbidity. Though it has been shown via several research that the number of newborns requiring exchange transfusion for neonatal hyperbilirubinaemia has been steadily decreasing over the last decade, it is still required in 7% of neonates admitted to hospital with hyperbilirubinaemia.¹⁹

Another study²⁰ revealed 34.2% of patients had a serious adverse event known as thrombocytopenia, the reason of which was unclear. These infants are at risk for low platelet counts because of both ET and phototherapy, both of which may induce thrombocytopenia. If the neonates show signs of bleeding, however, care should be prioritised. Additional complications that needed constant monitoring were hypoglycemia, respiratory distress, apnea, and cardio-respiratory arrest.

CONCLUSION

We found that the rate of thrombocytopenia in neonates having blood exchange transfusion for severe neonatal jaundice was not significantly greater than the rate in other studies. However, our results are from a single site and need to be confirmed by additional multicenter local investigations.

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