Original Research Article

Early hospital discharge and readmission jaundice in term babies

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ABSTRACT

Background: Hyperbilirubinemia is a common and often benign disease in the neonatal period. It is the most common cause of readmission in early neonatal period. Prolonged hyperbilirubinemia can result in chronic bilirubin encephalopathy. Increasing the hospital stay of otherwise healthy neonates is not an acceptable solution for medical, social and economic constraints. So, identifying the risk factors for readmission assumes importance. Aim of our study is to identify the risk factors for readmission jaundice in our hospital.

Methods: In this study, authors used a questionnaire to find out the risk factors for readmission in those babies who were readmitted with jaundice within 3 weeks of life to our hospital. During the study period, routine treatment practices were followed and there was no deviation from the standard of care for the purpose of research.

Results: Of the 2297 deliveries during this study period, 93 babies (4%) were readmitted with jaundice. Among the 93 babies, prevalence of blood group incompatibility was one of the common causes of neonatal jaundice. 46.2% of the babies had an early discharge. Total Serum bilirubin levels were measured by a hospital-based bilirubin assay. Babies with serum bilirubin level above phototherapy as per American Academy of Pediatrics practice guidelines 2004 were identified and subjected to photo therapy. All the babies in this study responded to photo therapy. No other interventions were needed.

Conclusions: Though an early discharge is the most cost-effective strategy in this era of high medical expenditure, we can identify certain high-risk babies, prone for readmission. Blood group incompatibility, infants of primiparous mothers and GDM mothers are more prone to readmission jaundice. Identifying these high-risk babies and educating the mothers is a more cost-effective strategy than prolonging the hospital stay for all babies.

Keywords: Bilirubin encephalopathy, Blood group incompatibility, Hyperbilirubinemia, Readmission jaundice

INTRODUCTION

Neonatal jaundice is the most common abnormal physical finding during the first week of life.¹ About two third of newborns develop clinical jaundice. Accumulation of unconjugated bilirubin causes yellowish discoloration of the skin and sclera in newborns.

In most infants, unconjugated hyperbilirubinemia is a normal physiological phenomenon.²

Neonatal Jaundice occur in nearly 60% of term and 80% of preterm neonates during first week of life.² 6.1% of well term newborns can have a serum bilirubin over 12.9 mg%. Serum bilirubin over 15 mg% is found in 3% of normal term newborns.³

Neonatal Hyperbilirubinemia causes concern for the parents as well as for the doctors.⁴ Early discharge of healthy term newborns after normal delivery is a common practice nowadays, because of medical reasons like

prevention of nosocomial infections, feasibility of feeding, economical constraints and also due to social reasons.

In significant number (6.5%) of babies, Neonatal Hyperbilirubinemia is the most common cause for readmission during the early neonatal period. Up to 4% of term newborns are readmitted to the hospital during first week of life, of them, approximately 85% are due to jaundice.⁵

American Academy of Pediatrics (AAP) recommends that newborns discharged within 48 hours should have a follow-up visit after 48 to 72 hours for any significant jaundice and other problems.⁶ This recommendation is not appropriate for our country due to limited follow-up facilities in the community. These babies may develop jaundice which may be overlooked or delay in recognition, unless the baby is closely monitored.

Concern of pediatrician regarding the early discharge are reports of bilirubin induced brain damage occurring in healthy term infants even without hemolysis. The sequelae could be serious as it may results in cerebral palsy, sensorineural hearing loss and mental retardation.^{7,8} The treatment of severe NH by exchange transfusion is associated with complications, time consuming, requires skilled manpower and is costly. Developing countries like India have limitations on the development of neonatal care facilities, particularly neonatal intensive care units.

The ultimate aim should be to benefit maximum number of newborn babies with cost effective treatment protocols. Neonatal Hyperbilirubinemia recognition, follow-up, early treatment and prevention of bilirubin induced encephalopathy has become more difficult as a result of earlier discharge from the hospital. Early treatment of jaundice with phototherapy is effective, simple, feasible even in peripheral care centers and cheap.

The aim of this study was to determine prevalence of neonatal readmission for jaundice and to find out the risk factors for readmission.

METHODS

This retrospective descriptive study was conducted in a tertiary care medical center. All babies delivered in Sree Gokulam Medical College and Research Foundation and readmitted with jaundice within the first 3 weeks of life were included in the study. An Operational definition of serum bilirubin value above phototherapy level in AAP bilirubin nomogram for phototherapy adjusted for gestational age and risk factors was considered as Significant hyperbilirubinemia.⁶ Out born babies readmitted with jaundice and Inborn babies readmitted with jaundice in other hospitals were excluded from the study.

In this descriptive study, mothers of babies readmitted with jaundice within first 3 weeks of life from June 2017 -May 2018 were subjected to a questionnaire to find out the risk factors for jaundice. An informed consent was obtained from the mothers before enrolling them.

Data recorded from mother include their age, blood group, drug consumption during pregnancy, parity, gestational age, any complications like diabetes, hypertension, mode of delivery, history of neonatal jaundice in previous babies, any feeding problems like nipple crack. Data recorded from babies include their sex, birth weight, blood group, length of hospital stay before discharge, readmission weight, cephalhematoma, exclusively breast feeding or not, whether urine output is adequate.

Laboratory Investigations done included Total and Direct Serum Bilirubin at admission, CRP, ANC, Serum Sodium and Serum bilirubin before discharge.

The main outcome of the study was inferred in terms of neonatal hyperbilirubinemia.

Serum bilirubin level above photo zones as per AAP chart adjusted for gestational age risk factors plotting bilirubin level against postnatal age in hours was taken as hyperbilirubinemia and treatment is advised, as per American academy of pediatrics practice parameter 2004.

During the study period, there was no deviation from the standard of care for the purpose of research. The data was entered in Microsoft Excel sheet and results were analyzed using SPSS software.

Ethical approval

- Written valid consent were obtained from mothers
- Permission obtained from institutional ethics committee.

Statistical analysis

The data was entered in Microsoft Excel sheet and results were analyzed using SPSS software.

RESULTS

Here, 2297 deliveries occurred during our study period, of which 93 babies were readmitted with jaundice. i.e Prevalence of readmission jaundice is 4%. 46.2% babies had an early discharge within 48-72 hours after delivery showing a clear relation of early discharge to readmission jaundice (Figure 1).

In this study about 35.5% babies are discharged after 120 hours, of which 90.9% babies are born to LSCS mothers. 8.6% babies have dehydration as indicated by a serum sodium level >145 mg%, of which 62.5% babies are

discharged within 72 hours. 2 babies had blood group incompatibility. 1 mother had nipple crack.

Out of 93 babies studied only 3 babies are preterm babies, remaining 90 babies are term babies. 17.2% babies having OA setting. 14% babies having OB setting and 14% babies having Rh setting (Figure 2). 7.5% babies are having cephalhematoma. 7.5% babies are having oral thrush.

Figure 1: Comparison of S. Bilirubin based on length of hospital stay before discharge 46.2% babies had an early discharge within 48-72 hours after delivery.

Figure 2: Percentage distribution of sample according to blood group setting.

Prevalence of OA incompatibility is 17.2%, OB incompatibility is 14%, Rh incompatibility is 14%.

DISCUSSION

Early discharge from hospital following delivery has now become a rule and policy in most hospitals. The major deciding factor behind this in developed countries being cost containment strategies of corporate hospitals or third-party payers like insurance companies. In developing countries, the major deciding factor behind such a decision being economic constraints and limited inpatient facilities. However, the impact of such a decision on the morbidity and mortality of the baby needs to be investigated. Early discharge policies are associated with increasing rates of readmissions. This not only has an impact on the baby's health but also imposes an extra

financial burden on the parents. Hence rules may need to be revised or adequate precautions to be taken.

The two major concerns of early discharge being Re-admission Jaundice and Failure to establish lactation. Hyperbilirubinemia is the most common cause of readmission to the hospital in early neonatal period. Mild physiological jaundice is a common entity in most newborns, not requiring treatment. But early identification of those requiring phototherapy is very important as delay in treatment can have devastating effects on the baby.

Kernicterus accounts for 10% of mortalities and at least 70% of long-term morbidities among jaundiced neonates⁸.

Failure in the initiation and establishment of adequate breastfeeding can also play an important role in the development of severe jaundice, because caloric deprivation and/or dehydration is known to increase plasma bilirubin levels.⁹

Early discharge from hospital may impact the establishment of breast feeding if timely support and counselling is not given.

American academy of paediatric recommends that newborns discharged within 48 hours should have a follow up visit after 2-3 days to detect significant jaundice and other problems.⁶

Another matter of concern especially in developing countries is the lack of easy access to medical facilities for early follow up. Hence the social background of the patient should also be considered during risk stratification Bhutani and colleagues generated a percentile-based bilirubin nomogram using hour specific pre discharge TSB levels from a racially diverse group of term healthy newborns with no ABO or Rh incompatibility who did not need phototherapy before 60 hours of age and of whom 60% were breastfed. Post discharge TSB levels were measured by a hospital-based bilirubin assay within 3 days after discharge. The risk for significant hyperbilirubinemia (TSB greater than 17 mg/dl) for infants with a pre discharge TSB above the 95th percentile (high risk zone) was 57%, for infants with TSB between the 75th and 95th percentiles (high intermediate risk) it was 13%, for infants with TSB between the 40th and 75th percentiles (low intermediate risk zone) it was 2.1%, and for infants below 40th percentiles (low risk) it was 0. This study showed that universal policy of measuring pre-discharge serum bilirubin would facilitates targeted

intervention, follow-up and also helps to reduce the potential risk for kernicterus development Knowledge of low risk of Hyperbilirubinemia in a new-born could assist the physician in the decision of early post-natal discharge thus minimizing unnecessary prolongation of hospitalization. At the same time identifying high risk

newborns for readmission jaundice and advising early follow up. Risk stratification based on Bhutani chart prior to discharge can definitely help reduce incidence of readmission jaundice

In this study we could find out the causes of readmission jaundice in our hospital and decide on the earliest allowable time of discharge. Also, risk stratify newborns as low/high risk for hyperbilirubinemia, based on identified risk factors.

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