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MANAGEMENT OF NEONATAL JAUNDICE WITH EXCHANGE TRANSFUSION IN PRETERM INFANTS -A DEVELOPMENTAL STUDY

Physiology

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ABSTRACT

Background: Jaundice is one of the commonest findings in the early neonatal period. About 75% of newborns develop Jaundice in first week of life.

Aim: To study the developmental milestones in preterm neonates managed with exchange transfusion in Government Hospital.

Materials &Methods: 30 newborn babies treated with exchange transfusion were studied retrospectively for a period of 2 years.

Results: All the 30 neonates showed development of milestones at appropriate age. Four neonates showed abnormal oto acoustic emission at 3 months which was normal at 6 months.

Conclusion: Hyperbilirubinemia in the neonatal period is a condition which may be overlooked or delay in recognition. Standard protocols can be followed in Government hospitals to prevent neonatal complications related to hyperbilirubinemia.

KEYWORDS

Hyperbilirubinemia, Exchange transfusion, Neonates.

Introduction

Jaundice is one of the commonest findings in the early neonatal period1. About 75% of newborn develop Jaundice in first week of life. It is first evident on skin of face, nasolabial folds and tip of nose. As the intensity of Jaundice increases, it progresses in cephalo-pedal direction. When soles and palms are distinctly yellow stained, serum bilirubin is usually more than 20mg/dl. Physiological polycythemia and decreased life of red blood cells of fetus results in release of haemoglobin 0.15g/km in a day1,2. 35 mg of bilirubin is released from one gram of haemoglobin. About 20 mg of bilirubin is delivered to liver in healthy form neonate1,3.

Due to deficiency of Y and Z acceptor proteins and UDP glucuronyl transferase enzyme in newbornbabies' hepatic clearance of bilirubin is decreased.Serum bilirubin measurements are done by conventional Van Den Bergh test in laboratories4.When jaundice in newborn does not conform to the time table described for physiological jaundice, it is designated as Pathological.One mole of albumin binds to equimolar amount of bilirubin. 8.5mg of bilirubin is binding with 1 gram of albumin1,5.

When bilirubin level exceeds that of albumin in blood, the unbound unconjugated bilirubin level increases, diffuses into blood brain barrier and deposited in neurons of basal ganglia, hippocampus and auditory nuclei producing kernicterus6.Among the measures to reduce serum bilirubin are phototherapy, drugs and exchange blood transfusion. Exchange blood transfusion is the effective and reliable method to reduce bilirubin levels7.

Materials & Methods:

A retrospective, descriptive study was carried out in a paediatric unit, Government hospital from October 2013 and October 2015. Clearance from Institutional ethics committee was taken.About 30 neonates who are preterm (35 – 37 weeks), delivered vaginally or by the elective caesarean without maternal or fetal complications were selected.

About 30 neonates who are preterm weight appropriate for age, delivered vaginally or by elective caesarean section without fetal complications were selected. All of them had been managed with exchange transfusion for neonatal hyperbilirubinemia as per neonatal protocols. The records were studied upto the age of 1 year.All the 30 babies showed normal APGAR scores at birth and followed up by paediatricians of the hospital.

The babies developed jaundice during the course of stay and examined clinically. When the abnormal rise of jaundice was observed, serum bilirubin was estimated. The value was compared with recommended parameters. They were given exchange transfusion as the levels were above the critical level appropriate age and weight following standard norms.

After a period of stay of 14 days they were discharged with normal physical findings.These children were examined in the outpatient department periodically and developmental milestones were recorded.Among the milestones, in this study, four milestones were selected. The new born babies were analysed for the development of milestones within the maximum of range of age for that milestones.

Selected Milestones Chart

Milestone Max. Target Age

Social smile3 Months (12 weeks)

Head Control6 Months (24 weeks)

Sitting without support9 Months (36 weeks)

Standing without support12 Months (48 weeks)

Hearing evaluation by

Otoacoustic emissions3 Months

Inclusion Criteria:

Preterm neonates (35 – 37 weeks of gestation) who are weight appropriate to age, delivered vaginally or by elective caesarean section without fetal complications.

Exclusion Criteria:

Term babies, Extremely Preterm, SGA, LGA, Congenital anomalies, Birth Asphyxia.

Results:

Out of the 30 neonatal babies studied, all the 30 babies showed the development of selected milestones within the target age. Four neonates showed abnormality in otoacoustic emission at 3 months of age which was again normal at 6 months of age.

Development of Critical level of Jaundice and age

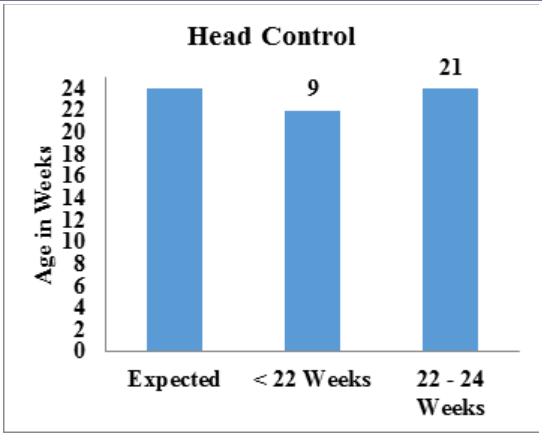
Age	No. of Babies
49 – 72 Hours	9
> 72 Hours	21

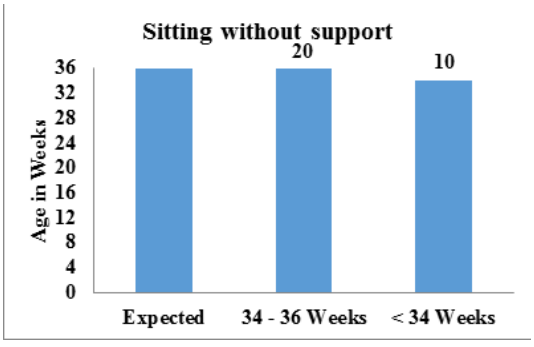
Social Smile

Age	No. of Babies
9 – 10 weeks	11
11 – 12weeks	19

Head Control

Age	No. of Babies
< 22 Weeks	9
22 – 24 Weeks	21





Standing without Support

Age	No. of Babies
44 – 48 Weeks	25
< 44 Weeks	5

During 1 year follow up, none of the babies showed delayed milestones.

Discussion

The preterm neonates were selected for exchange transfusion immediately after reaching the critical level of bilirubin. After the procedure, the serum bilirubin levels had fallen below the critical levels. Then the babies were followed up for rise of bilirubin for 14 days. None of the babies showed critical rise during the follow up period of one year. The paediatricians examined the babies at neonatal clinics and recorded the milestones in the growth charts based on Indian Academy of Paediatrics guidelines.

Following the standard protocols in the management, these preterm babies showed comparatively normal development of milestones on follow up.

Conclusion

Hyperbilirubinemia in the neonatal period is a condition which may be overlooked or delay in recognition8. This ends in serious complications which are preventable by close monitoring and appropriate intervention at appropriate time9.

Rational management of hyperbilirubinemia is dependent on reliable laboratory facilities for serum bilirubin estimation following the recommended guidelines for imitating treatment for appropriate age and weight and exchange transfusion for appropriate age and weight10.

When the recommended guidelines are followed in evaluating and treating the neonates with neonatal hyperbilirubinemia in selected neonates with the minimal resources available in a secondary level care centre, it is possible to prevent complications related to neonatal hyperbilirubinemioa.

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