Original Research Article

Cord blood bilirubin as a predictor of neonatal hyperbilirubinaemia

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Abstract

Hyperbilirubinaemia is a universal problem as it affects about 60% of full term and 80% of preterm neonates during their first week of life. The aim of this study is to evaluate the predictive value of umbilical cord bilirubin in identifying infants for subsequent hyperbilirubinemia, in full-term (FT) and late pre-term (PT) neonates. The present study was carried on 35 full term (FT) and 35 Late preterm (late PT) birth neonates. Cord blood bilirubin in late PT group (2.35±0.23) was significantly higher as compared to FT group (1.78±0.83). This can be used as a useful screening test for predicting neonatal hyperbilirubinemia and allowing safe postnatal Hospital discharge.

Key Words: Hyperbilirubinaemia, Full term, Late preterm.

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INTRODUCTION

Hyperbilirubinaemia is a universal problem as it affects about 60% of full term and 80% of preterm neonates during their first week of life[1,2]. The cause of jaundice is the aggregation of indirect bilirubin pigments in skin and in other tissues. Certain concentrations of this form of bilirubin is potentially toxic to central nervous system under certain conditions[3]. In preterm neonates bilirubin enters the brain as free bilirubin or as bilirubin bound to albumin due to presence of a disrupted blood-brain barrier and damages the brain neurons primarily[4]. It also happens in conditions like metabolic acidosis, asphyxia etc. The neurological complications caused are acute bilirubin induced encephalopathy and chronic bilirubin encephalopathy i.e. kernicterus[5,9]. Concerns regarding jaundice have increased after reports of bilirubin induced brain damage occurring in healthy term neonates even without haemolysis[6,8].

MATERIALS AND METHODS

The present study was carried out on full term and late preterm neonates from birth to 5th postnatal dayat Dr. Shankarrao Chavan Govt. Medical College and Hospital, Nanded on 70 newborns (35 FT and 35 late PT groups) with the following criteria

Inclusion Criteria

1. Any type of delivery, both genders.
2. Full term (gestational age is 37 weeks or more).
3. Late preterm (Gestational age >34 weeks and <37 weeks).
4. Absence of significant illness or major congenital malformation.

Exclusion Criteria

1. Significant illness (sepsis, RDS, asphyxia) that could aggravate hyperbilirubinemia.
2. Gestational age <34 weeks.
3. Birth weight below 2000 gm.

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Table 1: Distribution of newborns according to gender and mode of delivery

Characteristics	FT NO. (%)	PT NO. (%)	Total No. (%)
Male	20(57.1)	18 (51.4)	38 (54.3)
Female	15 (42.8)	17 (48.5)	32 (45.7)
NSVD Normal spontaneous vaginal delivery	17 (48.5)	22 (62.8)	39 (55.7)
CS cesarean section	18 (51.4)	13 (37.1)	31(44.3)

Laboratory Work: Two milliliters of cord venous blood was drained by a sterile syringe, put in clean capped plane bulb. Serum was used, samples were protected from light during processing and storage.Hemolyzed samples were excluded[7]. Cord blood bilirubin is estimated using commercial kit of Transasia and carried out on fully automated analyser (XL 640).

Statistical Analysis: The data collected after biochemical analysis were subjected to statistical calculation using appropriate statistical software. The mean, standard deviation/ standard error of mean were obtained. Critical value or test of probability less than 0.05 ($p< 0.05$) was regarded significant.

OBSERVATION AND RESULTS

Table 1: Table showing comparison of cord blood bilirubin between full term and preterm newborns

Characteristic	Mean± SD
Full term	1.78±0.83
Preterm	2.35±0.23
p value	<0.05

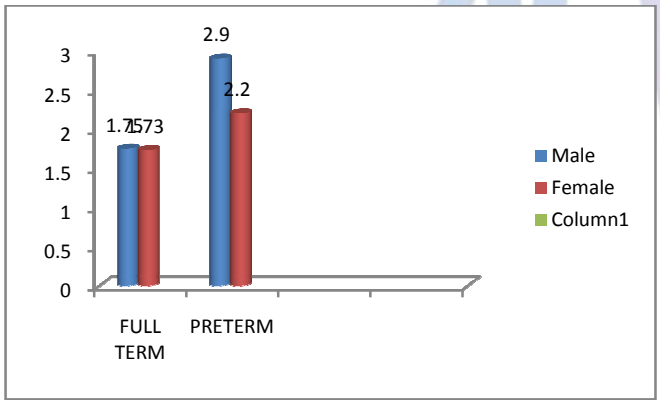

Figure 1: Graphical representation of cord blood bilirubin between full term and preterm male and female

DISCUSSION

Jaundice is a clinical condition that is often present and constitutes one of the major issues during the neonatal period[11]. In this study we investigated the correlation between level of cord blood bilirubin and development of hyperbilirubinemia in the first week of life. The study population consisted of 38 (54.3%) males and 32 (45.7%) females. In the PT group the mean total cord bilirubin was statistically significantly higher as compared to FT group. This matched with the results of Amar *et al*. and Rostami and Mehrabi[10,11].

CONCLUSION

According to above result we conclude that, in the PT group the mean cord bilirubin was statistically significantly higher compared to full term and required treatment in the form of phototherapy. So cord blood bilirubin can be used as a useful screening test for predicting neonatal hyperbilirubinemia and allowing safe postnatal Hospital discharge.

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