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Low Cord Serum Albumin is A Risk Indicator in Predicting Neonatal Jaundice.

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Abstract:
Objective: *1.Measuring the Cord Serum Albumin level (CSA) in predicting neonatal hyperbilirubinemia.*
Method: *Prospective study was performed on 100 healthy term neonates. Relevant maternal history is collected. Cord blood was collected from the healthy term neonates at birth, CSA measured. Neonate was assessed clinically every day. Total Serum Bilirubin (TSB) and blood group were assessed in neonate during 72-96 hours of life. TSB value ≥15mg/dl is considered Neonatal Hyperbilirubinemia (NH) which requires intervention like phototherapy (PT) or Exchange transfusion (ExT).*
Result: *Study cohort is grouped in Group 1, Group 2 and Group 3 based on Cord Serum Albumin level ≤2.8g/dl, 2.9-3.3g/dl and ≥3.4g/dl, respectively. Statistical analysis was done for correlation of CSA with NH. It showed that cord serum albumin level ≤2.8g/dl is critical, as it was seen in 90% of neonates who developed neonatal hyperbilirubinemia.*
Conclusion: *There is a correlation between Cord serum albumin level and neonatal hyperbilirubinemia. Cord serum albumin level of ≤2.8 g/dl is a risk indicator in predicting the development of neonatal hyperbilirubinemia at birth.*
Keywords: *Cord Serum Albumin; Neonatal Hyperbilirubinemia; Prediction; Neonates.*

I. Introduction

During neonatal period there is transition of bilirubin from fetal to adult type[1]. For conjugation and excretion of bilirubin an important liver enzyme is Uridine diphosphoglucuronyl transferase (UDPGT). which is detectable at 18 – 20 weeks of gestation. Adult value of this enzyme activity is demonstrable by 6–14 weeks of postnatal life[2].

Synthesis of albumin appears at approximately the 7th-8th wk. in the human fetus. Albumin concentrations are low in a neonate (~2.5 g/dL), reaching adult levels (~3.5 g/dL) after several months.[3] Bilirubin and albumin binds in an equimolar ratio. Free bilirubin appears when the bilirubin- to- albumin (B: A) ratio is > 0.8. 1 g of albumin binds around 8.5mg of bilirubin.[3]

During the first week of life Neonatal Hyper bilirubinemia is the commonest abnormal finding. most common cause for readmission during the early neonatal period (6.5%) is Neonatal Hyperbilirubinemia (NH)[4]. It is recommended that neonate who discharged within 48 hours should have a follow-up to check any significant jaundice and other problems after 48 to 72 hrs[5] Because lack of knowledge NH which may be over looked or delay in recognition by parents in our country. Physical examination is not a reliable measure of the serum bilirubin. Neonates those who are at risk of developing NH in early post natal period, for them we can give a follow up advice accordingly[6].

By measuring cord albumin and serum bilirubin individually we can predict the neonates who are at risk. Hence the objectives of the study is:

1.Measuring the Cord Serum Albumin level (CSA) in predicting neonatal hyperbilirubinemia.

II. Materials and Methods

This prospective study was conducted in Navodaya Medical College Hospital and Research Centre. The study group consists of 100 randomly selected eligible term neonates delivered at our hospital from 1stApril 2016 to august 31st 2016.

Inclusion criteria: Term babies both genders, Mode of delivery (normal and C-section), Birth weight ≥2.5kg, and APGAR ≥7/10 at 1 min.

Exclusion criteria: Preterm, Rh incompatibility, Neonatal sepsis, Instrumental delivery (forceps and vacuum), Birth asphyxia, Respiratory distress, Meconium stained amniotic fluid, Neonatal jaundice within 24 Hours of life and High risk pregnancies.

Demographic profile and relevant maternal information was collected by interviewing the mother and from mother's case sheet. Cord blood of 2 ml was collected during the delivery from placental end and sent for analysis. Gestational age was assessed by New Ballard score. All the babies were followed up daily for first 4 postnatal days and babies were daily assessed for NH and its severity. Total Serum Bilirubin (TSB) estimation was done at 72-96 hours of age for all neonates.

Cord blood collected at birth was analyzed by auto analyzer metho for Cord Serum Albumin. The main outcome of the study was inferred in terms of neonatal hyperbilirubinemia. Serum bilirubin ≥15 mg/dl after 72 hours of life was taken as hyperbilirubinemia and treatment is advised.

III. Results

Table I: Grouped based on Cord Serum Albumin (g/dl) level

Cord Serum Albumin (g/dl)	NO.	%
≤2.8 (Group 1)	44	44
2.9-3.3 (Group 2)	32	32
≥3.4 (Group 3)	24	24

Table 2 Correlation of Clinical Variable with Neonatal hyper bilirubinemia

variables	NNH		P VALUE
	No	Yes	
Gender			
male	50(55.5%)	6(60%)	
female	40(45.5%)	4(40%)	1.000
MOD			
Lscs	63(70)	4(40)	
Nvd	27(30)	6(60)	0.764
OXYTOCIN			
No	35(39%)	5(50%)	
yes	55(61%)	5(50%)	0.729
ALBUMIN			
<2.8	27(30%)	9(90%)	
2.9-3.3	30(33%)	1(10%)	
>3.4	33(37%)	0(0%)	0.003*

IV. Discussion

Incidence of hyperbilirubinemia varies from 8.3% to 12.8%[6,7] Incidence of hyperbilirubinemia in our study was 10.0% which correlates with other studies. The study cohort consisted of 100 term babies out of which 56 male and 44 female babies.

Sex of the baby is an independent factor to develop the neonatal hyperbilirubinemia (≥ 15mg/dl). Amar Taksande et al study on 200 neonates with 82 males and 118 females also found no correlation between the sex of the neonate and the neonatal hy-perbilirubinemia[8]

We found no relation between the neonate born to mother who received oxytocin during delivary and neonatal hyperbilirubinemia. Out of 100, only 60 received oxytocin for induction of labour. NH developed in 5/60 neonates whose mothers received oxytocin. Oral E et al 2003, in their study regarding effect of oxytocin on NH, concluded no significant effect of oxytocin infusion on neonatal hyperbilirubinemia[9]. Amar Taksande et al in his study showed no significant association (p 0.245) between the Oxytocin induction of labour and neonatal hyperbilirubinemia.[8] Our study result is similar with the studies of Oral E et al and Amar Taksande et al regarding oxytocin effect on neonatal hyperbilirubinemia.

Suchanda et al in 2011 found that 70% (14/20) neonates who developed significant NH had cord serum albumin level < 2.8 g/dl, 30% (6/20) neonates had CSA level 2.9-3.3 g/dl, and none of neonates with CSA level ≥3.4g/dl developed NH. There was Statistical significance noted between CSA with development of NH (p value <0.001).10 In our study, of the 100 neonates included, 10 neonate developed NH. In group 1 (CSA level < 2.8 g/dl) 80% (8/10); Group 2 (CSA level 2.9-3.3 g/dl), 20% (2/10) and Group 3 (CSA level ≥3.4g/dl), 0% developed NH requiring PT. Our study results correlated well with Suchanda et al.[10]

In our study, infants with neonatal hyperbilirubinemia (≥15mg/dl) had significantly lower levels of cord serum albumin (≤ 2.8g/dl). Therefore, it is possible to define a group of neonates at risk of developing jaundice needing phototherapy at birth based on CSA.

Cord serum albumin level ≥3.4g/dl can be considered safe, as none of neonates developed in this group had significant hyperbilirubinemia. Limitations of the study was that only full term healthy neonates were taken for the study.

V. Conclusion

By this above study we concluded that there is a significant relation between cord serum albumin and hyperbilirubinemia. Cord serum albumin level of ≤2.8 g/dl can be used a risk indicator in predicting the development of neonatal hyperbilirubinemia at birth. Cord serum albumin level ≥3.4g/dl can be considered safe for early discharge.

Conflict of Interest

None**.**

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