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ORIGINAL ARTICLE

Assessment of hyperbilirubinemia in neonates

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ABSTRACT:

Background: Hyperbilirubinemia is a medical condition characterized by an elevated level of bilirubin in the blood.The present study was conducted to assess hyperbilirubinemia in neonates. **Materials & Methods:** 104 neonates with jaundice of both genders were enrolled and estimation of bilirubin level, recording of etiology of hyperbilirubinaemia, and mode of delivery was recorded. **Results:** Out of 104 patients, males were 66 and females were 38. The mode of delivery was vaginal in 72 and caesarean in 32. Etiology was idiopathic in 47, physiological in 32, septicemia in 18 and Rh incompatibilityin 7 cases. Serum bilirubin level was 11-15mg/dl in 34, 15-18mg/dl in 47, 18-20mg/dl in 13 cases and >20mg/dl in 10 cases. The difference was significant (P< 0.05). **Conclusion:** In maximum cases, the most common etiology of hyperbilirubinemia in the newborn was idiopathic and mode of therapy used was phototherapy.

Key words: Hyperbilirubinemia, bilirubin, neonates

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INTRODUCTION

Hyperbilirubinemia is a medical condition characterized by an elevated level of bilirubin in the blood.[1] Bilirubin is a yellow pigment that forms when red blood cells break down. It is normally processed by the liver and then excreted from the body in bile. When there is an excess of bilirubin in the blood, it can lead to jaundice, a yellowing of the skin and eyes, and potentially other health problems.[2]

Increased breakdown of red blood cells can overwhelm the liver's capacity to process bilirubin. Conditions like hemolytic anemia or certain genetic conditions can lead to this.[3]Liver diseases, such as hepatitis, cirrhosis, or Gilbert syndrome, can impair the liver's ability to process bilirubin, leading to its accumulation in the blood.Blockage of the bile ducts, which transport bilirubin from the liver to the intestines, can result in the accumulation of bilirubin in the blood. This can be caused by gallstones, tumors, or other obstructions.[4]

Jaundice can be caused by various underlying medical conditions, including liver diseases (such as hepatitis, cirrhosis, or liver cancer), blood disorders (such as hemolytic anemia), bile duct obstructions (like gallstones or tumors), and certain medications.[5] In newborns, physiological jaundice is common due to the immature liver's inability to process bilirubin efficiently.The most noticeable symptom of jaundice is the yellowing of the skin, eyes, and mucous membranes. Other symptoms can include dark urine, pale stools, fatigue, abdominal pain, and itching.[6]The present study was conducted to assess hyperbilirubinaemia in neonates.

MATERIALS & METHODS

The present study consisted of 104 neonates with jaundice of both genders. Parents gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. A careful assessment was carried out. Estimation of bilirubin level, recording of etiology of hyperbilirubinaemia, and mode of delivery was recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 104		
Gender	**Male**	**Female**
Number	66	38

Table I shows that out of 104 patients, males were 66 and females were 38.

Table II Assessment of parameters

Parameters	Variables	Number	P value
Mode of delivery	Vaginal	72	0.01
	Caesarean	32	

Etiology	Idiopathic	47	0.04
	Physiological	32	
	Septicemia	18	
	Rh incompatibility	7	
Serum bilirubin level (mg/dl)	11-15	34	0.73
	15-18	47	
	18-20	13	
	>20	10	

Table II, graph I shows that mode of delivery was vaginal in 72 and caesarean in 32. Etiology was idiopathic in 47, physiological in 32, septicemia in 18 and Rh incompatibility in 7 cases. Serum bilirubin level was 11-15mg/dlin 34 15-18mg/dlin 47, 18-20mg/dlin 13 cases and >20mg/dlin 10 cases. The difference was significant (P< 0.05).

Graph I Assessment of parameters

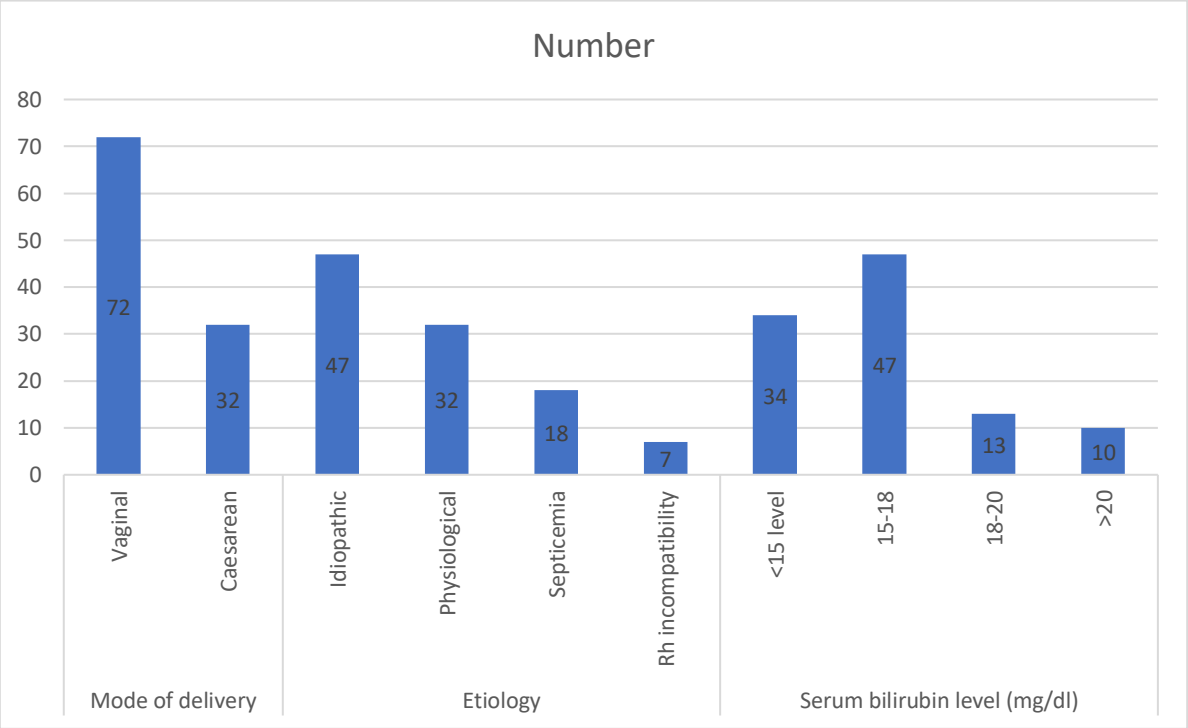

Table III Mode of therapy

Mode	Number	P value
Phototherapy	94	0.001
Exchange transfusion and phototherapy	10	

Table III shows that the mode of therapy was phototherapy in 94 and exchange transfusion and phototherapy in 10 cases. The difference was significant (P< 0.05).

DISCUSSION

The common cause of neonatal morbidity is hyperbilirubinemia. It is observed in 1st week of life around 60% of term & 80% of preterm neonates.[7,8] It is the visible manifestation of elevated serum concentration of bilirubin.[9] Neonates may not appear jaundiced until the serum total bilirubin exceeds 5 to 7 mg/dl (86 to 119 micromol/L). Neonatal hyperbilirubinemia is a cause of concern for the parents as well as for paediatrician.[10,11] Early discharge of healthy new borns after delivery has become a common practice because of social reasons, medical and economic constraints.[12,13]The present study was conducted to assess hyperbilirubinaemia in neonates.

We found that out of 104 patients, males were 66 and females were 38. The mode of delivery was vaginal in 72 and caesarean in 32. Carbonell et al[14] in their study a significant hyperbilirubinemia was present in 2.95% of the newborns. The correlation between serum and transcutaneous bilirubin was high (r = 0.92; p < 0.0001). Umbilical cord blood bilirubin with a cut-off point of 2.2 mg/dl was not a useful predictor of neonatal jaundice. At 24 and 48 hours of life serum bilirubin levels > or = 6 mg/dl and > or = 9 mg/dl, respectively, predicted a subsequent hyperbilirubinemia with a sensitivity of 100% at both

time-points, specificity of 47.5% and 64.3%, positive predictive value of 7.3% and 16.4%, respectively, and a negative predictive value of 100% for both. Transcutaneous measurement at 48 hours with a cut-off point of 13 (equivalent to a bilirubinemia of 9 mg/dl) predicts hyperbilirubinemia with a sensitivity of 94.4%, specificity of 51.7%, positive predictive value of 6.0% and negative predictive value of 99.6%. We found that etiology was idiopathicin 47, physiological in 32, septicemia in 18 and Rh incompatibility in 7 cases. Serum bilirubin level was 11-15mg/dl in 34, 15-18mg/dl in 47, 18-20mg/dl in 13 cases and >20mg/dl in 10 cases.Wong et al[15]studied the effects of hyperbilirubinemia on brainstem auditory pathways and neurodevelopmental status in 99 fullterm neonates with severe nonhemolytic hyperbilirubinemia. These were divided into three groups: group 1, moderate hyperbilirubinemia (*n* = 30; mean maximum total serum bilirubin = 320.7 µmol/L or 18.9 mg%); group 2, severe hyperbilirubinemia (*n*= 63; mean maximum total serum bilirubin = 369.0 µmol/L or 21.7 mg%); and group 3, super hyperbilirubinemia (*n* = 6; mean maximum total serum bilirubin = 457.2 µmol/L or 26.9 mg%). All received phototherapy, and three neonates also had exchange transfusion. Initial brainstem auditory evoked potentials were recorded in all at the mean age of 3.1 months (range 1—9 months). At initial assessment, only nine neonates (9.1%) had abnormal brainstem auditory evoked potentials. All except two returned to normal at 2 years. These two children had a hearing threshold at 50 nHL. All 99 children had regular physical, neurologic, visual, and auditory assessments every 3 to 6 months until the age of 3 years. There was no significant correlation between demographic factors (gender, gestational age, or birthweight), maximum total serum bilirubin, and total serum bilirubin at discharge with an abnormal brainstem auditory evoked potential. There was no significant difference in the rate of brainstem auditory evoked potential abnormalities between the three groups: moderate (10%), severe (7.9%), and super (16.7%).
The limitation of the study is the small sample size.

CONCLUSION

Authors found that in maximum cases, the most common etiology of hyperbilirubinemia in the newborn was idiopathic and mode of therapy used was phototherapy.

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