Paediatrics

CORRELATION OF BIRTH WEIGHT LOSS PERCENTAGE ON DAY3 OF LIFE WITH INCIDENCE OF NEONATAL HYPERBILIRUBINEMIA

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ABSTRACT **Background** Neonatal Hyperbilirubinemia (NH) is the most common finding during 1st week of life and it is the most common cause of readmission after early discharge. During the hospital stay, almost all newborns lose their weight in the first week of life. Birth weight and its loss play an important clinical marker for adverse perinatal and neonatal outcome, one of it being Neonatal Hyperbilirubinemia (NH). **Objective:** Correlation of weight loss on day3 with neonatal hyperbilirubinemia. **Methodology:** Case control study during the study period - February 2021 and August 2022 was performed on 108 full term neonates -54 in significant hyperbilirubinemia group (cases) and 54 in nonsignificant hyperbilirubinemia group (controls). Neonates were weighed initially at birth and then at 24, 48 and 72 hours. Weight loss percentage was calculated for each day and correlated with serum bilirubin values at 72 hours of life. Newborns were assessed clinically daily for icterus and for other complications during the study period. Results: Among 108 neonates enrolled in the study, the percentage of birth weight loss was higher in the significant hyperbilirubinemia group when compared to non-significant hyperbilirubinemia group (<0.001). **Conclusion:** Birth weight loss may be a predisposing factor for Neonatal Hyperbilirubinemia and may also serve as a clinical factor to predict and intervene significant NH at the earliest and prevent the complications associated with NH.

KEYWORDS : Birth weight loss, Total Serum bilirubin, direct serum bilirubin, Correlation and Newborns

I. INTRODUCTION

Almost all neonates loss their birth weight in the first few days of life which is mainly due to fluid loss, hypothermia, late cord clamping, as a consequence of usage of adipose tissue as a source of energy and feeding issues. Excessive weight loss is associated with complications like jaundice, hypoglycemia, and dehydration.

Neonatal Hyperbilirubinemia is the common finding during the first week of life in neonates. Over 85% of all term newborns and most of the preterm infants develop clinical jaundice.

Neonatal Hyperbilirubinemia (NH) is the condition which causes concern for parents and delays early discharge of term healthy babies after delivery and is the mostcommon cause for readmission during the early neonatal period.

Up to 4% of term neonates who were readmitted to the hospital during their first week of life, approximately 85% of them were for neonatal hyperbilirubinemia. [2] American Academy of Paediatrics recommends those newborns discharged within 48 hours should be followed-up after 48 to 72 hours of life for any significant jaundice and other associated problems. [3]

High serum bilirubin levels causes bilirubin induced neurological dysfunction (BIND) in some neonates. In 5 to 10 % of neonates who have clinically significant jaundice require treatment to prevent BIND. [4]

Therefore early recognition of NH, follow- up, early treatment and prevention of bilirubin induced encephalopathy is important. Early intervention of jaundice with phototherapy is effective, simple and cheap, whereas treatment of severe NH by exchange transfusion is expensive and is associated with complications, time consuming and requires skilled manpower. Hence by correlating the birth weight loss, newborns at risk for development of NH can be identified early and followed up in a cost effective way.

II. METHODOLOGY

The present study was conducted at Vydehi Institute Of Medical Sciences and Research Centre Bangalore, during the study period February 2021 to August 2022. CASE CONTROL STUDY was conducted on 108 full-term neonates, out of which 54 were in significant hyperbilirubinemia group (cases) and 54 in nonsignificant hyperbilirubinemia group (controls).

Inclusion criteria: All full-term, neonates exclusively breast fed were included in the study.

Exclusion criteria: Preterm, neonates with Congenital anomalies ,

Perinatal asphyxia ,Sepsis, those already receiving Phototherapy, Rh and ABO incompatibility and Neonates, who were shifted to intensive care unit for any interventions, were excluded from the study. Neonates were then weighed at birth by a digital weighing machine, and then daily at 24, 48 and at 72 hours. At 72 hours peripheral venous blood sampling was done and sent for total bilirubin, direct bilirubin levels. Incidence of neonatal hyperbilirubinemia on day 3 was correlated with birth weight loss percentage. Statistical analysis was done by using SSPE software.

III. RESULTS

The following table and figures shows the mean birth weight (table 1) and percentage of birth weight loss day 3 of neonatal life in both the study groups with significant p value of <0.005 (table 2) and with mean serum total bilirubin(15.7,9.1) and direct bilirubin level(0.6.0.5) in significant hyperbilirubinemia group and nonsignificant hyperbilirubinemia group respectively.(figure3,4).

Table 1 Mean birth weight being 3.0 kg ± 0.3SD

Variable	Group	Min.	Max.	Mean	SD	Median	IQR	P value
Birth weight Kg	Significant Hyperbilirubinemia	2.5	3.8	3.0	0.3	2.9	0.5	0.31
	Nonsignificant Hyperbilirubinemia	2.5	3.7	3.0	0.3	3.0	0.6	

Table 2: Distribution of data based on birth weight loss

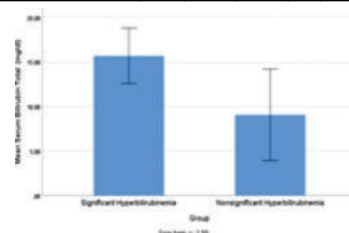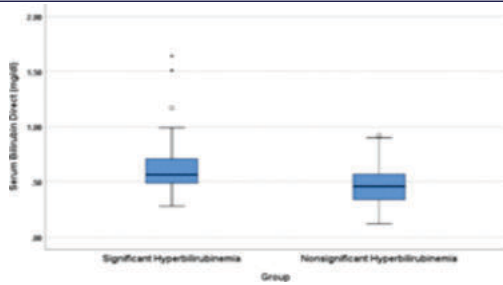| Variable	Group	Min.	Max.	Mean	SD	Median	IQR	P-value
Weight Loss % Day-3	Significant Hyperbilirubinemia	6.4	14.8	11.1	1.8	10.7	2.3	<0.001
	Nonsignificant Hyperbilirubinemia	2.3	7.2	5.2	0.8	5.3	0.7	

Figure 1 Total serum bilirubin

Figure 2 Direct serum bilirubin

IV. DISCUSSION

Case control study conducted during the study period enrolled 108 newborns which met the inclusion criteria was assessed.

In our Present study mean birth weight of 3.0 kg ± 0.3SD was noted and birth weight loss percentage on day 3 was calculated and was found to be 11.1%, respectively in the study group which was higher compared to the control group, with a significant p value of <0.001. Mean serum total bilirubin levels on day 3 of life were 15.7 mg/dl in the significant hyperbilirubinemia group when compared to 9.1 mg/dl in nonsignificant hyperbilirubinemia group, which was correlated with the birth weight loss The extent of weight loss and its correlation with hyperbilirubinemia have been variously reported in different studies. Similar to the present study, many other studies which were conducted reported that there was significant birth weight loss of more than 8% in the study group with significant p value. Limitation of this study: In the present study only term healthy neonates were included in the study and study population was confined to 108 neonates

V. CONCLUSION

Severe hyperbilirubinemia can occur without apparent reason in healthy neonates thereby the need for early prediction of severe jaundice has become increasingly important for identifying thoseneonates at risk of NH considering the severe neurological morbidities caused by bilirubin toxicity. Thereby birth weight loss percentage can be used as a simple, clinical tool to predict and intervene significant NH at the earliest and prevent the complications associated with NH.

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