General Movements Assessment in Term Newborns with Moderate Hyperbilirubinemia

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INTRODUCTION

Severe neonatal jaundice associated with hyperbilirubinemia and bilirubin neurotoxicity can result in long-term impairments, including irreversible athetoid cerebral palsy (CP), and speech, visuomotor, auditory, and other sensori-processing disabilities. However, some studies have shown that moderate hyperbilirubinemia may also cause minor neurological sequelae (1). The term Bilirubin-Induced Neurological Dysfunction (BIND) is used for the same changes (2).

Prechtl general movement assessment (GMA) method is used to predict cerebral palsy (CP) in infants with high risk of developing neurological dysfunctions (3).

Objective

Prechtl General Movements Assessment (GMA) is a non-invasive and cost-effective way to identify neurological causes which may lead to disabilities. The aim of this study is to compare term infants who had moderate hyperbilirubinemia and received phototherapy treatment and healthy term infants with GMA.

Prechtl General Movement Analysis is thought to be important in early diagnosis in terms of the neurotoxic effect of hyperbilirubinemia.

Material and methods

The study included 12 male and 9 female cases with moderate hyperbilirubinemia and 16 male and 5 female healthy infants. Phototherapy was applied to the babies with hyperbilirubinemia who had a high TSB value and met the phototherapy treatment criteria determined by the American Academy of Pediatrics. After the treatment, the babies were invited for control appointments when they were 2 months old. After the routine control and neurological examination, videos of the babies were requested from the families for GHA.

Babies who received phototherapy treatment were invited for control appointments in their 4th month. After routine control and neurological examination, videos of their families were taken for GHA. The babies in the control group were called to the hospital when they were 2 months and 4 months old. After the routine examination, videos of the babies were requested from the families for GHA.

TSB values between 12.9mg/dl and 19.9mg/dl were used for babies older than 72 hours postnatally for the diagnosis of moderate-moderate hyperbilirubinemia. All families were given training on head holding exercises and tummy tuck exercises when they came for their 2nd month follow-up. Information was given about the importance of giving stimuli to the developing neurological system of babies.

INTRODUCTION

In the hyperbilirubinemia group's 2 months evalution, poor repertoire was observed in 47.6% cases, and cramped synchronized movement pattern in 4.8% of them. 4.8% of the cases were considered as hypokinetic. In the 4th month control of the cases, 28.6% abnormal fidgety was detected. The 2nd month GMA, results of the patients in the hyperbilirubinemia group were found to be pathological compared to the healthy group ($p<0,05$). According to the 4th month GMA results, no significant difference was found. It was thought that the reason for this might be that the families of all babies involved in the study were given detailed information about head restraint exercises, tummy tuck exercises and the importance of giving stimuli to babies.

RESULTS

The 57.1% of infants with hyperbilirubinemia participating in the study were male and 42.9% were female. The mean week of delivery is 38.43±0.97. Average birth weight is 3201.66±548.49 gr, head circumference of babies is 34.77±0.55 cm on average. The diagnosis of hyperbilirubinemia was made on average postnatal 3.80±2.27 days. The mean hospital stay was 6.00±4.12 days and the mean venous bilirubin value was 13.80±2.43 mg/dl. An average of 12.00±8.04 hours of phototherapy treatment was applied. Poor repertoire and cramped synchronized movement pattern was found in 47.6% of the hypoelerubinemia group at the 2nd month follow-up. Hypokinesia was detected in 4.8% of the group. Abnormal fidgety was detected in 28.6% of the hyperbilirubinemia group at the 4th month control. No pathology was observed in 52.4% and 19% of the patients did not come for control. When evaluated together with the control group, a significant difference was observed in the pathological movement pattern in the hyperbilirubinemia group in the 2nd month videos ($p<0.05$). No significant difference was found between the two groups when the 4th month videos were compared.

Variable		Hyperbilirubinemia group	Control group	p
		n (%)	n (%)	
Second month video assessment results	PR	10 (47,6)	4 (19)	0,011*
	CS	1 (4,8)	-	
	H	1 (4,8)	-	
	Normal	9 (42,8)	17 (81)	
Fouth month video assessment results	F+	11 (52,4)	17 (81)	0,095
	AF	6 (28,6)	2 (9,5)	

PR: Poor repertoire
CS: Cramped synchronized
H: Hipokinetik
AF: Abnormal fidgety

CONCLUSİON

Our study was based on the hypothesis that mild-to-moderate hyperbilirubinemia is a risk factor for neurological development in newborns, and it was aimed to show that evaluation with GHA is an effective method that can be used in the follow-up of these babies. In the 2nd month general movements of the hyperbilirubinemia group, 57.2% of the pathologies were observed and there was a significant difference compared to the control group. No significant difference was found in the 4th month. It was thought that the reason for this might be that the families of all the cases included in the study were given detailed information about head restraint exercises, tummy tuck exercises and the importance of giving stimuli to babies.

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