



EFFECT OF PHOTOTHERAPY ON SERUM CALCIUM LEVEL IN HEALTHY TERM NEONATES WITH NON-HEMOLYTIC HYPERBILIRUBINEMIA

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ABSTRACT

Objective: To assess the effect of phototherapy on serum calcium level in healthy Term non-hemolytic hyperbilirubinemic neonates..

Method: This study was performed on 204 full-term healthy jaundiced neonates in which 137 male and 67 female that were managed with phototherapy. Serum calcium was checked on arrival and 48 hours after starting phototherapy.

A prospective Hospital based study conducted in Govt. Medical college and attached group of Hospital from September 2017 to December 2018 to determine the effect of phototherapy induced hypocalcemia.

Results: Out of 204 newborns, 148 newborns (72.50 %) developed hypocalcemia after 48 hours of starting phototherapy. There was reduction in serum calcium level after phototherapy but was no significant hypocalcemia present. None of them were symptomatic.

Conclusion: The study showed that no significant hypocalcemia present after phototherapy in healthy full term neonate. However, we recommended monitoring serum calcium level during and after phototherapy and we do not use prophylactic calcium in term healthy neonate.

KEYWORDS : Hypocalcemia, phototherapy, hyperbilirubinemia.

INTRODUCTION:

Hyperbilirubinemia is the single most common abnormal physical finding in the first week of life approximately 60% in Term neonate and 80% of Preterm neonate. Phototherapy plays a significant role in the treatment and prevention of hyperbilirubinemia in neonates.

This method leads to incidence of some side effects. A lesser known complication of the phototherapy is hypocalcemia.

Neonatal hypocalcemia is defined as total serum calcium concentration of < 7 mg/dl or ionized calcium concentration of <4 mg/dl (<1 mmol/L) in term neonates. Some studies showed that phototherapy induced hypocalcemia occurs due to decreased serum melatonin concentration.

AIMS AND OBJECTIVE:

To assess the effect of phototherapy on serum calcium level in healthy Term non-hemolytic hyperbilirubinemic neonates.

MATERIAL AND METHOD

Study Design: This is a prospective study done to determine the effect of phototherapy induced hypocalcemia.

Setting: NICU, Dept. of paediatrics, GMC, Kota Study Period: September 2017 to December 2018 Sample size: 204

204 Hyperbilirubinemic term newborns (137 males and 67 females) who fulfilled the inclusion criteria were included in this study. After getting written informed consent from the parents, a detail history was taken, General physical examination and systemic examination was done. Serum bilirubin and serum calcium level checked at the time of admission and 48 hours after starting phototherapy. Evaluation and management with phototherapy was done as per American academy of pediatrics 2004 guidelines. Data was collected and analysed by SPSS software, and quantitative statistical analysis was done. A p value <0.05 was considered significant.

Inclusion criteria

1. Cephalohematoma
2. External bruising

3. Breast feeding jaundice
4. Breast milk jaundice
5. Physiological jaundice

Exclusion criteria

1. Neonatal asphyxia
2. Infants of Diabetic mother
3. Infant undergoing Exchange transfusion
4. Hemolysis anemia/Rh/ABO incompatibility
5. Conjugated hyperbilirubinemia
6. Sepsis
7. Congenital malformation
8. Respiratory distress

Table 1 :-Demographic features of newborns:

*mean (percentage)

Variable	Mean (SD)
Gestational age (weeks)	38.12±0.078
Birth weight (Kg)	2.48+0.51
Time of appearance of icterus (hours)	118.4±50.2
Duration of phototherapy (hours)	42.48±10.50
Type of Delivery	
Normal vaginal delivery	114(55.88%)*
Lower segment cesarean section	90(44.11%)*

Table2 :- Serum Calcium level before and after phototherapy:

Parameter	Observation	Mean	S.D	p value
S. Calcium	Before phototherapy	9.70	1.45	0.749
	After phototherapy	9.54	7.02	

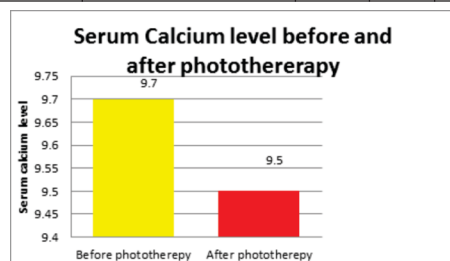


Figure: Showing Serum Calcium level before and after phototherapy

DISCUSSION

In present study, it was found that after phototherapy out of 204 neonates about 148 (72.5 %) babies had a decrease in serum calcium level from the initial value. This reduction in s. calcium level was found to be not significant statistically (p value 0.749).

These results are comparable with an Iranian study done by Alizadeti Thehari et al reported that out of 147 term babies, 56% babies had a reduction in s. calcium level after 48 hrs. phototherapy and 7% newborns developed hypocalcaemia (1).

Another study done by Karamifar et al in iran also reported that out of 91 term babies 8.7% had developed hypocalcemia after 48 hrs of phototherapy.(2) None of the hypocalcemic babies developed symptoms.

Study was done by Cyril Ignatious Rozario et al in 2017 in India on 100 term newborns in which about 67% of babies had a decrease in serum calcium level from the initial value. This reduction was statistically significant . Only 3% of babies developed hypocalcemia and none of these babies were symptomatic .(3)

Study done by Shrivastava and Goyal in 2018 in which 2.86% of hypocalcemia neonates develop jitteriness.(4)

Based on this study it is suggested that, even though the prevalence of hypocalcemia is less and there is no significant reduction in serum calcium level in healthy term newborns undergoing phototherapy, we should monitor serum calcium regularly in all babies who are receiving phototherapy for non-hemolytic hyperbilirubinemia.

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