

**Monica Tandon,
Deepika Nayar,
Shoba Ramachandran,
Umesh Kapil,**

*Department of Human Nutrition,
All India Institute of Medical Sciences,
Ansari Nagar, New Delhi 110 029.*

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Phototherapy Induced Hypocalcemia

Phototherapy is one of the routine method for management of hyperbilirubinemia the world over. However, it has some side effects including possible hypocalcemia. There are only a few studies on hypocalcemic effect of phototherapy with controversial results(1-3). We, therefore, evaluated the effect of phototherapy on serum calcium.

Twenty preterm and twenty term babies with jaundice having 50-75% of the total serum bilirubin levels recommended for exchange transfusion were included in the study to find the incidence of hypocalcemia in preterm and term babies receiving phototherapy. Ten preterm and ten term babies matched for age, sex and type of feeding with bilirubin levels not high enough to warrant the start of phototherapy were taken as controls. It was planned that whenever bilirubin of controls would reach 75% of exchange levels they would be changed over to other group or

deleted. All those babies who were at known risk of developing hypocalcemia (IUGR, infants of diabetic mothers, prolonged and difficult labor, respiratory distress, sodium bicarbonate therapy and septicemia) were excluded. The study group received continuous phototherapy for 24 hours with a spectral irradiance of $4 \text{ \mu w/sq cm}^2/\text{nm}$ at 450 nm keeping a distance of 45 cm.

The controls were not given phototherapy. Serum' calcium levels were estimated in both the groups at 0 hours and at 48 hours of the study by O-cresolphthalein complexon (OCPC) method.

The mean gestational age, birth weight and postnatal age in preterm babies in study group was 34.30 ± 1.16 weeks, 2.15 ± 0.15 kg and 4.00 ± 1.38 days, respectively as compared to 35.00 ± 0.67 weeks, 2.16 ± 0.09 kg, and 3.50 ± 0.53 days in the controls. In the term babies in the study group, mean gestational age, birth weight and postnatal age were 37.55 ± 0.69 weeks, 2.80 ± 0.22 kg and 5.40 ± 2.06 days as compared to 37.60 ± 0.84 weeks, 2.81 ± 0.18 kg

TABLE I—Serum Calcium at 48 hours

S. Calcium (mg/dl)	Preterms		Terms	
	Study (n=20) No. (%)	Controls (n=10) No. (%)	Study (n=20) No. (%)	Controls (n=10) No. (%)
<7.00	11 (55)	0 (0)	6 (30)	0 (0)
7.1-9.0	4(20)	5(50)	8 (40)	3 (30)
9.1 -11.0	5(25)	5 (50)	6 (30)	7 (70)
Mean (± SD)	7.9(±1.41)	9.19 (±0.78)	6.32 (±1.32)	9.44(±0.91)

and 4.80 ± 1.03 days in the controls. The mean serum calcium levels at 0 hours in preterm and term babies in the study group were 9.67 ± 1.10 mg/dl and 9.51 ± 1.19 mg/dl, respectively as compared to 9.60 ± 0.66 mg/dl and 9.58 ± 0.76 mg/dl in controls ($p > 0.05$). There was a statistically significant ($p < 0.05$) difference in the serum calcium levels at 48 hours between the study group and controls (*Table I*). Eleven (55.0%) of the preterm babies in the study group developed hypocalcemia as compared to none in the control group. Six (30%) of the term babies developed hypocalcemia whereas none of the controls had hypocalcemia. Of the 11 preterms, 7 (63.6%) had jitteriness and 3 (27.3%) had irritability. Among 6 term babies, 3 (50.0%) had jitteriness and 1 (16.7%) was irritable.

The significant fall in serum calcium level in preterms and term babies after phototherapy observed was comparable to an earlier report(3). The incidence of hypocalcemia in preterm babies in our study (55%) was in consonance with an earlier study (52.3%)(4). However, a much higher incidence (90%) of hypocalcemia has also been documented(3). The reason for this difference is not very clear. The incidence of hypocalcemia in term babies in

the present study (30%) was also lower in comparison to 75% observed in that study(3).

To conclude, phototherapy induced hypocalcemia is a significant problem and hence calcium supplementation to these babies may be considered.

**B.K. Jain,
Harmesh Singh,
Daljit Singh,
N.S. Toor,**

*Department of Pediatrics,
Dayanand Medical College,
Ludhiana.*

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