Original Research Article

Clinical profile of neonates with jaundice: A descriptive study

Sachin S Hatti[1], R H Desai[2], P K Wari[3], V H Ratageri[4], Charanraj Honnalli[5*]

{[1]Senior Resident, Department of Pediatrics} {[5]Assistant Professor, Department of Pediatrics Division of Neonataology}, KBNIMS, Kalburgi, Karnataka, INDIA.
[2]Associate Professor, [3]Professor and HOD, Department of Pediatrics, KIMS, Hubli, Karnataka, INDIA.
[4]Professor, Department of Pediatrics, KIMS, Hubli, Karnataka, INDIA.
Email: craj9192@gmail.com

Abstract

Ensuring a safe level of serum bilirubin and brain damage prevention is the primary aim of the treatment. Reduction of serum bilirubin levels and prevention of neurotoxicity can be achieved by phototherapy, exchange transfusion and pharmacotherapy. At critical levels of serum bilirubin exchange transfusion is most effective. Newborns admitted to NICU with hyperbilirubinemia who met the inclusion and exclusion criteria were included in the study. The mean age of presentation of jaundice in study population in hours of life was 81±28.36 hrs. Most of them presented on day 3 (32.43%) followed by day 4 of life (29.72%). The mean ± SD of bilirubin was 18.03 ± 2.70mg/dl and 8.10 ± 2.49mg/dl before and after phototherapy respectively with significant p value (< 0.05).

Key Words: Serum Bilirubin, Newborns, Phototherapy.

[*]**Address for Correspondence:**
Dr. Charanraj Honnalli, Assistant Professor, Department of Pediatrics, Division of Neonataology}, KBNIMS, Kalburgi, Karnataka, INDIA.
Email: craj9192@gmail.com
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INTRODUCTION

Placenta plays a very important role in clearance of unconjugated bilirubin in fetus. Formation itself is limited of CB in the fetus because of decreased fetal hepatic blood flow, decreased hepatic ligandin and decreased UDPGT activity. Uridinediphosphoglucuronyl transferase (UDPGT) is detectable at 18 – 20 weeks. UDPGT levels in full term and preterm neonates are usually less than 0.1% of adult values. Reaches the adult value by 6–14 weeks of postnatal life[1]. Bilirubin is detected in normal amniotic fluid as early as 12 weeks of gestation, but usually disappears by 36- 37 weeks. Increased bilirubin in amniotic fluid is seen in hemolytic disease of newborn and in fetal intestinal obstruction below bile ducts.[2] Dermal staining of jaundice in newborns progresses in a cephalo-caudal direction, apparently relate d to the relative thickness of skin at various parts, skin being thinnest on the face and extremely thick over the palms and soles. Premature babies have relatively thinner and thus jaundice shows through more readily even at lower serum bilirubin level[3].But physical examination is not a suitable measure of serum bilirubin estimation. Bilirubin toxicity is a known complication in term as well as preterm neonates especially with risk factors. Unbound bilirubin or bound to albumin can enter disrupted blood brain barrier. In conditions like asphyxia, hypercarbia, hyperosmolarity, prematurity the BBB is more vulnerable for disruption.[4] Ensuring a safe level of serum bilirubin and brain damage prevention is the primary aim of the treatment. Reduction of serum bilirubin levels and prevention of neurotoxicity can be achieved by phototherapy, exchange transfusion and pharmacotherapy. At critical levels of serum bilirubin exchange transfusion is most effective.[5] The use of phototherapy was first discovered accidentally, at Rochford Hospital in Essex, England, when Sister J.

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Ward noted that sunshine decreased neonatal jaundice. Meanwhile, hospital biochemists noted erroneously low bilirubin levels in samples sitting in sunlight before processing. The first evidence for light as an effective therapy for infantile hyperbilirubinemia by Creamer and collegues. The landmark randomized controlled trial showing the efficacy of phototherapy was published by Pediatrics editor Jerold Lucey in 1968. Phototherapy initially was used in low birth weight and full term infants primarily to prevent slowly rising serum bilirubin levels from reaching levels that might require an exchange transfusion. Phototherapy is often used in full-term and near-term infants who have left the hospital and are readmitted on days 4 to 7 for treatment of TSB levels of 20 mg/dL (342 µ mol/L) or more. These infants need a full therapeutic dose of phototherapy (now termed intensive phototherapy) to get the bilirubin level down as soon as possible[6]. Phototherapy units delivering a spectral irradiance of 8 to 10µ W/cm2/nm in the 430 to 490 nm band, positioned 20 cm above the infant and whereas special blue fluorescent lamps will deliver 30 to 40 µ W/cm2/nm[7]. Intensive phototherapy implies irradiance in the blue-green spectrum with spectral irradiance of at least 30 µ W/cm2/nm over the same bandwidth delivered to as much of the infants body surface area as possible[8].

MATERIAL AND METHODS

Newborns admitted to NICU with hyperbilirubinemia who met the inclusion and exclusion criteria were included in the study

Type of Study: Hospital based prospective observational study

Inclusion Criteria: Term AGA neonates with unconjugated hyperbilirubinemia requiring phototherapy according to AAP guidelines.

Exclusion Criteria:

Newborns with,

- Jaundice in first 24 hr of life
- Born to a diabetic mother
- Birth asphyxia
- Neonatal sepsis
- Jaundice lasting more than 14 days
- Babies who had exchange transfusion or were on TPN.

RESULTS

Table 1: Baseline maternal characteristics (n=148)

Characteristics				Number (n)	%
Maternal	Type of delivery	Full term normal delivery (FTND)		76	51.35%
		LSCS		66	44.59%
		Instrumental delivery (forceps andvaccum)		6	4.05%
	Parity	Primipara		89	60.13%
		Multipara		59	39.86%
	Blood	A +ve		24	16.2%
	group	-ve		11	7.4%
		B +ve		18	12.1%
		-ve		5	3.3%
		AB	+ve	6	4.05%
			-ve	0	-
		O	+ve	79	53.37%
			-ve	5	3.3%

Table 2: Age of presentation of jaundice (n=148)

Age of Presentation	No. of cases	(%)
24-48 HRS	15	10.13%
49-72 HRS	48	32.43%
73-96 HRS	44	29.72%
97-120 HRS	22	14.86%
121-144 HRS	16	10.81%
145-168 HRS	3	2.02%

The mean age of presentation of jaundice in study population in hours of life was 81±28.36 hrs. Most of them presented on day 3 (32.43%) followed by day 4 of life (29.72%).

Table 3: Weight wise distribution of study population (n=148)

Weight (gm)	No of cases	Percentage (%)
2500 to 2999 gm	113	76.35%
3000 to 3499 gm	33	22.29%
3500 to 3999 gm	2	1.35%

The mean weight of babies included in the study was 2791 ± 230 gms, with most of the babies(113) being in the range of 2500 to 2999 grams corresponding to 76.35 %.

Table 4: Sex distribution (n=148)

Sex	No of cases	(%)
Male	81	54.7%
Female	67	45.2%

In our study, 81 (54.7%) were males and 67 were females (45.2%) wit h M: F ratio being 1.20:1.

Table 5: Symptoms at the time of presentation (n=148)

Symptoms	Number of cases	(%)
Jaundice	148	100
Fever	19	12.8%
Lethargy	13	8.78%
Refusal to feeds	25	16.89%
Convulsions	0	0

The most common presentation was jaundice in our study (100%), followed by refusal to feeds (16.8%), fever and lethargy by (12.8%) and (8.78%) respectively.

Table 6: Comparison of mean serum bilirubin before and after pt by Wilcoxon matched test (n=148)

Time point	Mean	SD	Mean diff.	SD diff.	% of change	Z-value	p-value
Before treatment	18.03	2.70	9.90	2.54	55.00	10.624	0.000
After treatment	8.10	2.49				2	1

The mean ± SD of bilirubin was 18.03 ± 2.70mg/dl and 8.10 ± 2.49mg/dl before and after phototherapy respectively with significant p value (< 0.05).

DISCUSSION

In our study a total of 148 cases were included and all were term babies, all were appropriate for gestational age, other studies like Eghbalian *et al* [9]where 63 cases were included, in Taheri *et al*[10] 147 cases were included, Gheshmi *et al*[11] included 100 neonates and Prabhakar *et al*[12] had 24 cases included in their study. All these studies also included only term babies weighing >2.5 kg as in our study. In contrast to our study, some studies included preterm as well as term AGA babies like Sethi *et al*[13](1993) 20 preterm and 20 term and Karamifar *et al*[14](2002) selected preterms more than 31 weeks and included 62 preterms and 91 terms, Aroral *et al*[15](2014) included 46 preterm and 54 term neonates. The sample size was more in our study compared to others. In our study, the mean weight of babies was 2791+/- 230 grams, it was similar to other studies like Taheri *et al* [10]it was 3182 +/- 430 grams, Karamifar *et al* [14]it was 2889+/- 474 grams and in Jain *et al*[16] it was 2800+/- 220 grams. In studies done by Gheshmi *et al*[11] and Prabhakar *et al*[12], all babies included were weighing >2.5 kg. In our study, 81 were males and 67 were females with ratio being 1.20, with ratio in other studies being 0.6, in Prabhakar *et al*[12], in Arora *et al* [15] the ratio is 0.8, 1.22 was in Gheshmi *et al*[11] and 1 in case of Taheri *et al*[10].

Mean total serum bilirubin (TSB) in our study group were 18.03±2.70mg/dl compared to a similar study by Karamifar *et al* [14] which showed 18.0±2.4 mg/dl in term babies and in a study by Taheri *et al*[10], mean TSB in term neonates was 20.1±3.3 mg/dl.

CONCLUSION

- A total of 148 neonates were studied after calculating sample size with M:F ratio of 1.2:1.
- All were term AGA neonates with mean birth weight of 2791 ± 230 grams
- The mean ± SD of bilirubin was 18.03 ± 2.70mg/dl and 8.10 ± 2.49mg/dl before and after phototherapy respectively with p value < 0.05.

REFERENCES

1. Wallerstein H. Treatment of severe erythroblastosisfetalis by simultaneous removal and replacement of the blood of the newborn infant. Science 1946; 103:583.
2. Cremer RJ, Perryman PW, Richards DH. Influence of light on the hyperbilirubinemia of infants. Lancet 1958; 1:1094.
3. Guruprasad G. Bilirubin Metabolism- what we should know? J Neonatol 2001; 1:4-7.
4. Guruprasad G, Deepak C, Sunil A. NNF Clinical Practice Guidelines [internet]. India: NNF; 2010.Management of Neonatal Hyperbilirubinemia. [cited 2010].
5. Ives NK.Neonatal jaundice. In: Rennie JM (ed.) Roberton"s text book of neonatalogy. 3rd ed. London: Churchill Livingston; 2012. p. 715-732.
6. Kramer LI. Advancement of dermal icterus in the jaundiced newborn. Am J Dis Child 1969; 118:454-458.
7. Singh M. Care of the Newborn. 7th ed. New Delhi: Sagar Publications; 2010. p. 254-74.
8. Dobbs RH, Cremer RJ. Phototherapy.Arch Dis Child. 1975;50(11):833–836
9. Eghbalian F, Monsef A. Phototherapy induced hypocalcemia in icteric newborns. IJMS 2002;27(4):169-71
10. Taheri PA, Sajjadian N, Eivazzadeh B. Prevalence of phototherapy induced hypocalcemia in term neonate. Iran J Pediatr 2013;23(6):710-11.
11. Gheshmi, AbdolmajidNazemi *et al.* "Prevalence of Hypocalcemia after Phototherapy among Neonates Who Underwent Phototherapy in Koodakan Hospital in Bandar Abbas in 2013." Electronic Physician 7.6 (2015): 1387–1390.
12. Prabhakar N, Lazarus M, Ahirwar M. Effect of phototherapy on serum ionic calcium level in neonates

with hyperbilirubinemia, European journal of pharmaceutical and medical research 2016,3(4), 510-514
13. Sethi H, Saili A, Dutta AK. Phototherapy induced hypocalcemia. Indian Pediatr 1993; 30:1403-1406.
14. Karamifar H, Pishva N, Amirhakimi GH. Prevalence of Phototherapy Induced Hypocalcemia. Iran J Med Sci 2002; 27(4):166-168.
15. Arora S, Narang GS, Singh G. Serum calcium levels in preterm and term neonates on phototherapy. J Nepal PaediatrSoc 2014;34(1):24-28.
16. Jain BK, Singh H, Singh D, Toor NS. Phototherapy induced hypocalcemia. Indian Pediatr1998; 35(6):566-7.

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