International Journal of Contemporary Pediatrics
Garg K et al. Int J Contemp Pediatr. 2018 Sep;5(5):1851-1858
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: http://dx.doi.org/10.18203/2349-3291.ijcp20183519

Original Research Article

Prospective study of clinical profile, causes, risk factors and treatment of hyperbilirubinemia in preterm and term babies

Komal Garg, Vamshi Krishna Kondle*

Department of Paediatrics, Kamineni Institute of Medical Sciences, Narketpally, Telangana, India

Received: 23 May 2018
Accepted: 26 June 2018

***Correspondence:**
Dr. Vamshi Krishna Kondle,
E-mail: vamshikondle@gmail.com

ABSTRACT

Background: Neonatal jaundice is often physiologic and benign, but dangerous, at levels producing neurological injury, adding on to mortality and morbidity in developing nations. Hence the present study is undertaken to document the proportion, clinical profile, causes, risk factors and treatment of hyperbilirubinemia in preterm and term babies.
Methods: This study conducted over 100 hyperbilirubinemia babies who admitted in Rich Pediatric Hospital, Pogathota, Nellore during the period of October 2014 to September 2015.Hyperbilirubinemia is more common among preterm babies born to mothers of 19-22 years and term babies born to mothers of 21-26 years age group.
Results: The most common etiological factors identified among all the gestational categories were sepsis (23.0%) followed by ABO incompatibility (20.0%) and Rh incompatibility (6.0%). Among preterm babies (35-37 wks.) the most common were ABO incompatibility (15.0%), Sepsis (10.0%) and polycythemia (10.0%), while among term babies, the most common factors were ABO incompatibility (23.9%), Sepsis (16.4%) Rh incompatibility (7.5%) and Cephalhaematoma (7.5%). In a large proportion of cases, etiology remined idiopathic (44.0%).
Conclusions: Requirement of exchange transfusion was more among term babies compared to preterm babies. Rh incompatibility was the only etiology.

Keywords: Hyperbilirubinemia, preterm babies, term babies

INTRODUCTION

Jaundice is the visible manifestation of elevated serum bilirubin as evident on the skin and sclera. In adults, it is manifested at levels more than 2 mg/dl while in neonates it is manifested when it is more than 7 mg/ dl.[1] Neonatal jaundice, a physiologic condition reflecting modulated changes in bilirubin production and metabolism, affects virtually all newborns. Often it resolves by the end of the first week of life without treatment or squeal. In 60% of all term newborns there is some degree of jaundice while in preterm babies it goes up to 80%.[2] Of them, 4-6% develop significant neonatal hyperbilirubinemia, usually above 15 mg/dl or required treatment.[1,3] Over years, incidence have increased to 10-14%, probably by increased suspicion and detection.[4] But now many hospitals practice early discharge of mothers and babies which has increased chances of missing hyperbilirubinema.[5]

Hence the present study is undertaken to document the proportion, clinical profile, causes, risk factors and treatment of hyperbilirubinemia in preterm and term Babies. The objective of the present study was to estimate the proportion of neonatal hyperbilirubinemia in preterm and term babies, to study the etiology and risk factors for

neonatal hyperbilirubinemia in preterm and term babies and to study the response to the modalities of treatment instituted in preterm and term babies

METHODS

This is a Prospective descriptive hospital-based study conducted at Rich Pediatric Hospital, Nellore during the period of October 2014 to September 2015.

Sample size

The sample size is calculated depending on the previous study which shows the prevalence of significant hyper bilirubineimia 10.5% in term babies and 25.3% among near term.[6]

The sample size based on estimates of proportion was calculated with the 95% confidence interval with precision of 5%. We obtained a sample size of 138 for term babies and 288 for preterm babies by using following formula:(Z21- α/2 Pq/d2).

As per the previous year data from Rich hospital the total no admissions in NICU were 1064 out of which 734 were term babies and 330 were preterm babies.

Inclusion criteria

- Neonates with significant jaundice admitted in NICU during study period.
- Age group 0-28 day's babies.

Exclusion criteria

- Where informed consent of parent/guardian was not obtained.
- Babies with dysmorphic face.
- Babies whose direct serum bilirubin was > 2 mg/dl.
- Babies who died during hospital stay.
- Babies in whom, necessary investigations could not be done, or treatment Could not be given due to any reason.

Method of collection of data (methodology)

During study period 130 babies who developed hyperbilirubinemia were investigated in NICU and were treated as per the departmental protocol, based on American academy of pediatrics guidelines (Table 1 and 2) and Cockington nomogram.

Risk factors associated with the development of hyperbilirubinemia including birth weight, gestational age, age of mother, birth asphyxia, meconium stained liquor, cephalhematoma, pattern of feeding was noted and analyzed. Among them, 100 babies, including 33 preterm babies and 67 term babies who met the inclusion criteria were selected by random sampling and were further analyzed for the extent and etiology of hyperbilirubinemia according to clinical study proforma and for the response to treatment modalities like phototherapy and exchange transfusion.

Table 1: Guidelines for phototherapy in preterm babies.

Guidelines for term neonates			
Age (hours)	Phototherapy at bilirubin level (mg dl)	Exchange transfusion, if intense phototherapy fails or is not available at bilirubin level (mg/di)	Exchange Transfusion even if intensive phototherapy is effective at bilirubin level (mg/di)
24-48 hours	12-15	20	25
48-72 hours	15-18	25	30
>72 hours	17-20	25	30

Table 2: Guidelines for exchange transfusion in preterm babies.

Guidelines For Lbw Neonates		
Weight (grams)	Phototherapy at bilirubin level (mg/di)	Exchange transfusion at bilirubin level (mg/di)
<1000	Prophylactic	10-12
1000-1499	7-9	12-15
1500-1999	10-12	15-18
2000-2499	13-15	18-20

For all babies receiving phototherapy, serum bilirubin was monitored every 24 hours till 24 hours after stopping phototherapy and for babies undergoing exchange transfusion, after 6 hours, 24 hours, 48 hours following the procedure, till serum bilirubin normalized. A complete hemogram was done to identify the etiology and severity of hyperbilirubinemia.

RESULTS

Proportion of hyperbilirubinemia

The total number of cases admitted in the Rich hospital NICU during the time period between October 2014 and September 2015 were 1262 babies the distribution of hyperbilirubinemia according to gestational age is shown in Table 3. Results show that 80% of babies with HBR were in the gestional age <32 weeks and 37% in the gestation age between 32-34 weeks and in 17.95% of babies with total Preterm babies were found to have HBR. Table 4 shows that there is increased predilection of male gender (58%) to get involved. Table 5 represents that higher number of Low Birth weight are involved in preterm categories.

Table 3: Distribution of hyperbilirubinemia cases according to gestational age.

Gestational age	No. of babies	Babies with HBR	% of babies with HBR
>37 weeks	939	72	7.77
35-37 weeks	259	30	11.58
32-34 weeks	54	20	37.0
<32 weeks	10	8	80.0
Total Preterm	323	58	17.95
Total babies	1262	130	10.30

Low birth weight as a risk factor among babies with significant hyperbilirubinemia is 41.0% (p<0.001).

Table 4: Gender distribution among study population (n= 100).

Gestational age		Sex of the baby		Total	P Value (Chi^2 test)
		Male	Female		
>37 weeks	Count	39	28	67	0.245
	%	58.2	41.8	100.0	
35-37 weeks	Count	9	11	20	
	%	45.0	55.0	100.0	
32-34 weeks	Count	7	3	10	
	%	70.0	30.0	100.0	
<32 weeks	Count	3	0	3	
	%	100.0	0.0	100.0	
Total	Count	58	42	100	
	%	58.0	42.0	100.0	

Table 5: Birth- weight distribution among study population (n= 100).

Gestational age		Birth Weight				Total	P Value (Chi^2 test)
		NBW	LBW	VLBW	ELBW		
>37 weeks	Count	57	5	0	0	62	<0.0001
	%	91.9	8.1	0.0	0.0	100.0	
35-37 weeks	Count	2	20	0	0	22	
	%	9.1	90.9	0.0	0.0	100.0	
32-34 weeks	Count	0	4	8	0	12	
	%	0.0	33.3	66.7	0.0	100.0	
<32 weeks	Count	0	0	3	1	4	
	%	0.0	0.0	75.0	25.0	100.0	
Total	Count	59	29	11	1	100	
	%	59.0	29.0	11.0	1.0	100.0	

As shown in Table 6 hat hyperbilirubinemia is more common among preterm babies born to mothers of 18-22 years and term babies born to mothers of 21-25 years age (p<0.05).

Table 7 shows birth asphyxia is more in preterm babies of 35-37 weeks. gestation (15.0%) than in term babies (9.0%) (p<0.05). As shown in table 8, breast feeding is high in term babies (62.7%) and it is less in preterm babies of (35-37) weeks gestation (40.0%) (p<0.05). It implies preterm babies are more prone to develop hyperbilirubinemia due to insufficient feeding in the first week of life.

Table 9 shows that in term babies Idiopathic (45.2%), ABO incompatibility (25.81%) and sepsis (16.1%) are predominant etiology, whereas in preterm babies of (35-37) weeks gestation Idiopathic (50.0%), ABO

incompatibility (15.0%), Polycythemia (10.0%) and Sepsis (10.0%) predominate. Sepsis is the major etiology in preterm babies of (32-34) weeks gestation (70.0%) and <32 weeks gestation babies (75%) It is statistically significant (P<0.05-significant).

Table 6: Maternal age distribution among study population (n= 100).

Gestational age		Mother's age in years															Total
		18	20	21	22	23	24	25	26	27	28	29	30	31	32	33	
>37 weeks	Count	0	1	5	14	11	10	7	1	2	7	1	5	1	1	1	67
	%	0.0	1.5	7.5	20.9	16.4	14.9	10.4	1.5	3.0	10.4	1.5	7.5	1.5	1.5	1.5	100%
35-37 weeks	Count	3	5	3	3	2	0	0	1	0	1	1	1	0	0	0	20
	%	15.0	25.0	15.0	15.0	10.0	0.0	0.0	5.0	0.0	5.0	5.0	5.0	0.0	0.0	0.0	100.0
32-34 weeks	Count	3	5	0	2	0	0	0	0	0	0	0	0	0	0	0	10
	%	30.0	50.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
<32 weeks	Count	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
	%	66.7	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Total	Count	8	11	8	19	14	10	7	2	2	8	2	6	1	1	1	100
	%	8.0	11.0	8.0	19.0	14.0	10.0	7.0	2.0	2.0	8.0	2.0	6.0	1.0	1.0	1.0	100.0

P - Value (Chi^2 test) = 0.004

Table 7: Birth asphyxia among study population (n=100).

Gestational age		Birth asphyxia		Total	P value (Chi^2 test)
		Presen	Absent		
>37 weeks	Count	6	61	67	0.023
	%	9.0	91.0	100.0	
35-37 weeks	Count	3	17	20	
	%	15.0	85.0	100.0	
32-34 weeks	Count	0	10	10	
	%	0.0	100.0	100.0	
<32 weeks	Count	0	3	3	
	%	0.0	100.0	100.0	
Total	Count	9	91	100	
	%	9.0	91.0	100.0	

Table 10 shows significant hyperbilirubinemia appears early in Rh incompatibility (11.83 hours) and late in Sepsis (81.30 hrs) (p<0.001). Table 11 shows that phototherapy was initiated early in Rh incompatibility and late in Sepsis. P-Value is very highly significant. Phototherapy was initiated at lower levels of serum bilirubin in Rh incompatibility followed by Sepsis, Polycythemia and at higher levels in Idiopathic, Cephalhaematoma and ABO incompatibility (p<0.001). Table 12 shows Peak Serum Bilirubin is high in term babies (17.89 mg/dL) than in total preterm babies (16.20 mg/dL) (p=0.002). Table 13 shows duration of phototherapy in preterm babies (49.40 hrs) is less than term babies (57.50 hours) (p=0.005). Table 14 shows duration of phototherapy is high for Rh incompatibility, Polycythemia, Sepsis whereas least duration in Idiopathic cases (P<.0001). As shown in table 15, risk factors like Age in hours of significant hyperbilirubinemia, Age at initiation of Phototherapy, Pre-Phototherapy bilirubin, Peak serum bilirubin, according etiology Exchange transfusion, Pre Exchange-transfer serum bilirubin in shows no significant among different gestation age groups and pre-term.

Table 8: Pattern of feeding among study population (n=100).

BWC		Pattern of feeding						Total	P value (Chi^2 test)
		BF	FF	BF+FF	BF+IVF	FF+IVF	IVF		
>37 weeks	Count	42	0	8	17	0	0	67	<0.001
	%	62.7	0.0	11.9	25.4	0.0	0.0	100.0	
35-37 weeks	Count	8	1	4	5	2	0	20	
	%	40.0	5.0	20.0	25.0	10.0	0.0	100.0	
32-34 weeks	Count	0	0	1	7	2	0	10	
	%	0.0	0.0	10.0	70.0	20.0	0.0	100.0	
<32 weeks	Count	0	0	0	0	0	2	2	
	%	0.0	0.0	0.0	0.0	0.0	100.0	100.0	
Total	Count	50	1	13	29	4	2	99	
	%	50.5	1.0	13.1	29.3	4.0	2.0	100.0	

Table 9: Etiology of Hyperbilirubinemia among study population (n=100).

Gestational age		Etiology of Hyperbilirubinemia						Total	P value (Chi^2)
		ABO-I	Rh-I	Sep	Py	CH	Id		
>37 weeks	Count	16	5	11	0	5	30	67	0.001
	%	23.9	7.5	16.4	0.0	7.5	44.8	100.0	
35-37 weeks	Count	3	1	2	2	0	12	20	
	%	15.0	5.0	10.0	10.0	0.0	60.0	100.0	
32-34 weeks	Count	1	0	7	0	0	2	10	
	%	10.0	0.0	70.0	0.0	0.0	20.0	100.0	
<32 weeks	Count	0	0	3	0	0	0	3	
	%	0.0	0.0	100.0	0.0	0.0	0.0	100.0	
Total	Count	20	6	23	2	5	44	100	
	%	20.0	6.0	23.0	2.0	5.0	44.0	100.0	

Table 10: Age of significant hyperbilirubinemia according to etiology among study population (n=100).

Etiology of hyperbilirubinemia	Mean (Hours)	Std. Deviation	N
ABO incompatibility	62.10	12.113	20
Rh incompatibility	11.83	2.858	6
Sepsis	81.30	24.012	23
Polycythemia	77.00	4.243	2
Cephalhaematoma	74.80	6.419	5
Idiopathic	76.82	18.644	44
Total	70.91	24.059	100
		P<0.001	

DISCUSSION

In present study, the proportion of significant hyperbilirubinemia was 10.30%, 17.95% in preterm babies and 7.77% in term babies which is similar to the reported studies. Narang et al, Sarici SE et al and SGRO have shown the prevalence neonatal HBR was 11.18%, 16.1% and 10.53% respectively. In present study, we identified that 41% of the babies with significant hyperbilirubinemia were low birth weight babies. In similar study done by Manzoor A. Arif in Karachi, 42.5% of the babies with hyperbilirubinemia were low birth weight.[7] In the present study, we observed that 80.0% of <32-week babies, 37.0% of 32-34 weeks babies, 11.58% of 35-37-week gestation babies and 7.77% of term babies developed significant hyperbilirubinemia. Thus, prevalence of hyperbilirubinemia is increasing with decreasing gestation. In Present study, there was clear male predominance with respect to hyperbilirubinemia with 58.0% affected babies being males. Similar results were obtained in other studies by Kulkarni SK et al and Amar Shah et al. Present study revealed that hyperbilirubinemia is more common among late prerm babies born to mothers of 19-22 years and term babies born to mothers of 21-26-year age group. It is found to be statistically significant. Gale R. et al also obtained similar results.[8] In present study, birth asphyxia was found to be a significant risk factor (p=0.023), but it is more in late preterm babies compared to term babies. This can be due associated co-morbidities in mother like PIH and associated IUGR in late preterm babies. Other studies by Arif. K identified birth asphyxia as significant risk factor and by Shao Wen Cheng identified birth asphyxia as insignificant risk factor.[7,9]

Table 11: Age at initiation of phototherapy in hours and Pre-phototherapy bilirubin according to etiology among study population.

Etiology of hyperbilirubinemia	Age at initiation of phototherapy in hours		Pre phototherapy bilirubin		N
	Mean	Std. Deviation	Mean	Std. Deviation	
ABO incompatibility	62.10	12.113	17.450	2.5025	20
Rh incompatibility	11.83	2.858	7.083	4.1513	6
Sepsis	81.30	24.012	15.735	2.2121	23
Polycythemia	77.00	4.243	16.150	0.2121	2
Cephalhematoma	74.80	6.419	17.320	1.4237	5
Idiopathic	76.82	18.644	17.386	1.3203	44
Total	70.91	24.059	16.373	3.1719	100
	P<0.0001		P<0.0001		

In present study obtained very high statistical significance for insufficient feeding in late preterm babies due to lack of breast feeding which in turn leading to breast feeding jaundice in first week of life. It was found that majority of the term babies (62.7%) with hyperbilirubinemia were exclusively breast fed, unlike late preterm babies (40%). Shao –Wen Cheng and others in their study found that a high bilirubin level was significantly associated with exclusive feeding. Bertini G had similar results.[9,10]

Table 12: Peak serum Bilirubin among study population (n=100).

Gestational age	N	Mean
>37 weeks	67	17.894
35-37 weeks	20	17.440
32-34 weeks	10	15.820
<32 weeks	3	15.400
Total preterm babies	33	16.200
Total	100	17.521
	P=0.002 (Anova Test)	

In present study, the most common etiological factors noted among all gestational categories were sepsis (23.0%) followed by ABO incompatibility (20.0%) in Rh incompatibility (6.0%). Among late preterm babies, the most common were ABO incompatibility (14.0%), Sepsis (10.0%) and polycytemia (10.0%), while among term babies, the most common factors were ABO incompatibility (23.9%), Sepsis (16.4%), Rh incompatibility (7.5%) and Cephalhaematoma (7.5%). In a large proportion of cases, etiology remained idiopathic (44.0) %).

Table 13: Duration of phototherapy among study population (n=100).

Gestational age	N	Mean	Minimum	Maximum
>37 weeks	67	49.40	20	116
35-37 weeks	20	43.35	20	93
32-34 weeks	10	75.50	23	119
<32 weeks	3	53.67	44	71
Total babies	33	57.50	20	119
Total	100	50.93	20	119
	P=0.005 (Anova Test)			

Singhal PK detected the commonest causes as idiopathic (34.6%), prematurity (16.7%) and ABO incompatibility (14.3%).[11] Narang A detected the most common etiological factors as idiopathic (57.8%) and G6PD deficiency (17.7%) and sepsis (7.4%).[12] Sgro M and colleagues in their study in Canada identified ABO incompatibility as the cause in 18.6% cases among 258 infants who developed severe neonatal hyperbilirubinemia.[2] Betul SB, et al in their study on 388 infants late preterm and term infants found 6.44% cases are due to Rh incompatibility.[13]

Kulkarni et al, in their study in Maharashtra found that 8.34% babies having significant hyperbilirubinemia due to septicemia.[14] Narang et al found that 6.3% cases were having cephalhematoma.[4] In preterm babies, periventricular intraventricular hemorrhage is common, producing hyperbilirubinemia.

In this study 2.0% of the babies who developed hyperbilirubinemia had polycythemia. This is similar to study by Arif. K and Bhutta ZA who studied 5570 births from January 1992 to December 1994 in Karachi and found that polycythemia was seen in 2.5% of cases.[7] Present study shows that in 44% cases cause of significant hyperbilirubenemia was not found. This is similar to study done by kulkarni who found that in 35.0% cases etiology was idiopathic.

Significant hyperbilirubinemia appeared early in preterm baby's categories (60.0 to 69.9 hours) whereas it appeared late in term babies (73.94 hours). In individual etiologies significant hyperbilirubinemia appeared early in Rh incompatibility (11.83 hours) followed by ABO incompatibility (62.10 hours) and late in Sepsis (81.30 hours).

Bhat S in his review article has documented that significant hyperbilirubinemia developed earlier in preterm babies when compared to term babies. Madan A and others in their review of neonatal hyperbilirubinemia documents an early occurrence of significant hyperbilirubinemia in preterm babies.[15,16]

Table 14: Duration of phototherapy in hours according to etiology among study population.

Etiology of hyperbilirubinemia	Mean	Std. Deviation	N
ABO Incompatibility	57.60	19.696	20
Rh incompatibility	79.00	14.993	6
Sepsis	63.52	26.407	23
Polycythemia	68.00	0	2
Cephathaematoma	54.80	14.342	5
Idiopathic	36.27	18.288	44
Total	50.93	24.291	100
		P<0.0001(Anova Test)	

Peak serum bilirubin was higher for preterm babies (mean= 17.89 mg/dl) when compared to total term babies (mean=16.20mg/dl). Bhat S has documented that peak serum bilirubin was higher in preterm babies when compared to term babies.[15]

This study found that phototherapy was initiated early in preterm babies (mean 64.05 hours) when compared to term babies (74.94 hours). Narang. A and co-workers in his analysis of 551 cases found that phototherapy was initiated earlier in term babies (72.47 hours) compared to preterm babies (77.66 hours).[12]

Preterm babies were noticed in present study to have lower pre-phototherapy bilirubin (mean=15.50 mg/dl) as compared to term babies (mean=16.48 mg/dl). Babies with Rh incompatibility had the least pre-phototherapy bilirubin (mean=7.08 mg/dl) probably because intervention was at the earliest. The highest pre-phototherapy bilirubin was for ABO incompatibility (17.45 mg/dl).

Table 15: Non-significant treatment variables among study population.

Factors	Term n=67 >37 weeks	n=20 35-37 weeks	n=10 32-34 weeks	n=3 <32 weeks	Total mean in preterm babies		Total Mean	P Value (ANOVA Test)
ASHBR								
Mean	73.94	63.05	69.60	60.00			70.91	0.281(NS)
Std. Deviation	23.871	23.898	26.311	14.000				
AIPT								
Mean	74.94	64.05	70.60	61.00			71.91	0.281(NS)
Std. Deviation	23.871	23.898	26.311	14.000				
PrePT								
Mean	16.487	16.605	15.450	14.700	15.50		16.373	0.582(NS)
BR-Pk according to etiology	ABO-I	Rh-1	Sep	Py	CH	Id		
Mean	18.705	18.650	16.252	16.600	18.020	17.477	17.521	0.016(NS)
Std. Deviation	1.4877	4.2566	2.1952	0.8485	0.2588	1.1121	1.1121	
ET-A								
Mean	26.50	13.00	0.0	0.0			23.80	0.534(NS)
Std. Deviation	17.234	0.0	0.0	0.0				
Pre ET-bilirubi								
Mean	20.275	16.200	0.0	0.0			19.460	0.467(NS)
Std. Deviation	4.3828	0.0	0.0	0.0				

Singhal PK in his analysis of 4154 cases of hyperbilirubinemia reported initiation of phototherapy as a lower bilirubin level in low birth weight babies and hyperbilirubinemia due to haemolytic etiologies. Present study results are corroborating with this study.[11] The present study observed that phototherapy was given for a longer duration in preterm babies (mean=57.50 hours) which was much more than that for term babies (mean = 49.40 hours). Phototherapy was given for the maximum duration for Rh incompatibility (mean= 79.00 hours), followed by polycythemia (mean=68.00 hours) and sepsis (mean= 63.52 hours) and least in idiopathic cases (36.27 hours). Singhal PK et al analyzed 454 cases and noted that a longer duration of phototherapy was required for low birth weight babies.[11] Also, he found that duration of phototherapy was more for babies with prematurity and sepsis.

In this requirement of exchange transfusion was comparatively more in term (4 babies), whereas only one baby needed exchange transfusion in preterm babies. Babies with significant hyperbilirubinemia who required exchange transfusion was 5%. Arif and Bhutta ZA reported 3% of babies required exchange transfusion in their study.[7]

In present study five cases required exchange transfusion and all were due to Rh incompatibility. In study of Singhal PK majority of exchange transfusions were done for Rh incompatibility.[11] In Seddigahah study, majority of exchange transfusions were due to ABO incompatibility.[17]

Exchange transfusion was done in Rh incompatibility where preterm babies require exchange transfusion early at 13.00 hours whereas in term babies at 26.50 hours in this study.

In present study, pre-exchange transfusion bilirubin was 16.20 mg/dl in preterm babies whereas 20.27 mg/dl in term babies. This is because exchange transfusion was done early in preterm babies to reduce rapidly raising levels of bilirubin.

CONCLUSION

Prematurity, Low birth weight, birth asphyxia, septicaemia, exclusive breast feeding and polycythemia have been identified in present study as significant risk factors.

Hyperbilirubinemia is more common among preterm babies. Hyperbilirubinemia due to incompatibilities, sepsis and polycythemia contributed a significant fraction among preterm babies whereas incompatibilities, sepsis, cephalhematoma were major etiologies among term babies. Significant hyperbilirubinemia developed early but persisted longer and required prolonged phototherapy in preterm babies. Requirement of exchange transfusion was more in term babies.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Camilia R. Martin, Mary Lucia P. Gregory, John P. Cloherty. Neonatal Hyperbilirubinemia. Manual of Neonatal Care. 7th ed. Cloherty JP, Eichenwald EC, Hansen AR, Stark AR: Lippincott Williams and Wilkins; 2012:304-39.
2. Sgro M, Campbell D, Shah V. Incidence and cases of severe neonatal hyperbilirubinemia in Canada. CMAJ. 2006;175(6):587-90.
3. Maisels MJ, Watchko JF, Bhutani VK, Stevenson DK.An approach to the management of hyperbilirubinemia in the preterm infant less than 35 weeks of gestation. J Perinatol. 2012;32:660-4.
4. Narang A, Kumar P, Kumar R, Neonatal Jaundice in very low birth Weight babies. Indian J Pediatr. 2001;68(4):307-10.
5. KJ Barrington, K Sankaran, Canadian Pediatric Society, Fetus and Newborn committee, Guidelines for detection, management and prevention of hyperbilirubinemia in late preterm and term newborns, Pediatric Child Health. 2012;12(SB):1B-12B.
6. Sarici SU, Serdar MA, Korkmaz A, Erdem G, Oran O, Tekinalp G, Yurdakok M, Yigit S. Incidence, course and prediction of hyperbilirubinemia in near-term and term newborns. Pediatr. 2004;113(4):775-80.
7. Arif K, Bhutta ZA. Risk factors and spectrum of neonatal jaundice in a birth cohort in Karachi. Indian Pediat. 1999;36(5):487.
8. Gale R, Sediman Ds, Dollberg S, Stevenson DK. Epidemiology of neonatal jaundice in the Jerusalem population. J Pediatr Gastroenterol Nutr. 1990;10(1):82-6.
9. Cheng SW, Chiu YW, Weng YH. Etiological analyses of marked neonatal hyperbilirubinemia in a single institution in Taiwan. Chang Gung Med J. 2012;35(2):148-54.
10. Bertini G, Dani C, Tronchin M, Rubaltelli FF. Is breastfeeding really favoring early neonatal jaundice? Pediatr. 2001;107(3):E41.
11. Singhal PK, Singh M, Paul VK, Deorari AK, Ghorpade MG. Spectrum of neonatal hyperbilirubinemia: an analysis of 454 cases. Indian Pediatr. 1992;29(3):319-25.
12. Narang A, Gathwala G, Kumar P. Neonatal jaundice-an analysis of 551 cases. Indian Pediatr 1997;34:429-32.
13. Siyah Bilgin B, Altun Koroglu O, Yalaz M, Karaman S, Kultursay N. Factors affecting bilirubin levels during first 48 hours of life in healthy infants. BioMed Res Int. 2013;2013.
14. Kulkarni SK, Dolas AL, Doibale MK. Profile and causes of neonates with indirect hyperbilirubinemia in a tertiary care centre. Int J Basic Appl Med Sci. 2013;3:110-5.
15. Bhat. S. Neonatal Jaundice. Guha's Neonatology Principales and practice 3rd ed. Saili. A, Bhat S, Shenoi. A: Jaypee publishers. 2005;879-900.
16. Madan A, MacMohan JR, Stevenson DK. Neonatal hyperbilirubinemia: Textbook of the newborn 5th ed. A very GB, Fletcher MA, Mac Donald MG: Lippincott Willian and Willian. 1999;1226-56.
17. Seddighah Sakha, Manizha Mostafa et al Exchange Transfusion in severe hyperbilirubinemia an experience in North West Iran Turkish, Journal Paediat. 2010;52(4):367-71.

Cite this article as: Garg K, Kondle VK, Prospective study of clinical profile, causes, risk factors and treatment of hyperbilirubinemia in preterm and term babies. Int J Contemp Pediatr 2018;5:1851-8.