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Comparative Study of Prophylactic and Therapeutic Role of Phenobarbitone in the Hyperbilirubinemia in V.L.B.W Babies with Birth Weight 1000-1499 Grams and Their Outcome

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Abstract

Management of Neonatal Jaundice in Premature Very Low birth weight babies are difficult as most of such babies are already complicated by serious illnesses like RDS, Apnea of Prematurity, Temperature instability, Sepsis, intraventricular Hemorrhage etc. Prolonged Phototherapy and Exchange transfusions in such babies carries significant risk of Morbidity and mortality. Any Prophylactic drug could help in reducing the severity of jaundice in such babies. We evaluated the prophylactic Role of Phenobarbitone in such babies starting at 6 hours of life and compared with therapeutic doses started after babies developed jaundice from day two onwards with control group who didn't received any drug and found significant reduced risk of severe jaundice needing prolonged phototherapy in the Prophylactic Group.

Keywords: Neonatal jaundice; Very low birth weight babies; Phenobarbitone

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Introduction

Any Prophylactic Therapy for Neonatal Jaundice which would prevent the rise of total serum bilirubin to dangerous levels would be a better option especially in VLBW babies. Prophylactic therapy should decrease the peak total serum bilirubin, the duration of jaundice, the need for exchange transfusion and the incidence of bilirubin related neurological problems in the infants. Phototherapy (PT) as well as Phenobarbitone (PB) have been evaluated as prophylactic agents for NNJ. Both the modalities are effective in decreasing the Peak Total Serum Bilirubin (PTSB) level [1,2].

Material and Method

This study was conducted in the INBORN and OUTBORN Nurseries in the department of pediatrics D.D.U. Hospital, Hari Nagar during a study period of Dec 2006 to Nov. 2007

Sample size

Total of 165 babies of birth weight between 1000 to 1499 grams were randomized into three groups.

Group I: 65 babies were enrolled in the group and were given prophylactic Phenobarbitone (PB) at dosage of 5mg/kg per day i/v in two divided doses, the first dose was given within 6 hours of birth

Group II: 50 babies of birth weight 1000-1499 grams who developed clinical jaundice beyond day 2 of life were given phenobarbitone therapeutically at dose of 5mg/kg/day i/v in two divided doses for next 5 days.

Group III: Consisted of 50 babies as control group and was not given any drug.

Results

There were 65 babies included in Group I (we included 65 babies in group I as we expected 77% of them to develop clinical significant jaundice at day 2 of life, as per National Neonatal Perinatal database report 1995, 80% of VLBW babies surviving more than 2 days develop significant jaundice requiring PT and ET. And as per PGIMER, India data 2000, 76.6% babies of birth weight 1000 to 1499 grams developed significant jaundice, so we included 65 babies in Group I because 77% of 65 comes out to be 50). 50 babies were included in GROUP II and Group III each [3-5].

The mean peak TSB was 8.62 mg% in group I, 10.10 mg% in group

Table 1 Mean peak TSB values in the three groups.

	Group I	Group II	Group III	P value		
				I *vs.* II	I *vs.* III	II *vs.* III
Peak TSB values (mg/dl) (mean ± SD)	8.62 ± 3.46	10.10 ± 3.25	13.45 ± 10.95	0.015*	P<0.0001*	P<0.0001*
Time of peak TSB (Age in hours) (mean ± SD)	80.12 ± 26.92	83.03 ± 27.44	97.55 ± 25.95	0.56*	P<0.0001*	0.004*
*Using Mann-Whitney test.						

Table 2 Duration and need of Phototherapy (PT).

	Group I (64)	Group II (50)	Group III (50)	P value		
				I *vs.* II	I *vs.* III	II *vs.* III
No. of babies requiring PT	41 (64.01%)	40 (80.00%)	43 (86.01%)	0.02*	0.008*	0.39*
Duration of PT (in hours) (mean ± SD)	82.05 ± 36.61	120.26 ± 39.86	132.81 ± 49.70	P<0.0001**	P<0.0001**	0.20**
Duration of PT (hours) (Range)	20 to 200	60 to 230	60 to 260			
*Using Chi-Square test. **Using Mann-Whitney test.						

II and 13.45 mg% in group III. The difference between group I and group II was statistically significant ('P' value 0.015).The difference between groups I and group III and group II and group III were highly statistically significant (P<0.0001).

The mean time of peak TSB were 80.12 hours, 83.03 hours and 97.55 hours in the three groups .The difference was not statistically significant between group I and II (P 0.56),but were significant between group II and III and highly significant between groups I and III (P<0.0001) (**Table 1**).

It was seen that babies who survived for 2 days, in group I, Out of 64 babies, 41 babies (64.01%) developed significant jaundice requiring PT, while 40 out of 50 developed significant jaundice in group II and 43 out of 50 developed clinically significant jaundice in group III and needed PT (**Table 2**). The difference between group I and III were statistically significant, but between group II and III was not significant.

The mean duration of PT in hours among groups I, II and III were 82.05, 120.26 and 132.81 hours respectively. Here again the difference between groups I and III were highly significant but between group II and III was not statistically significant.

In total 25 babies (15%) required Exchange transfusion in three groups, 6 (9.25%) in group I, 8 (16%) in group II and 11 (22%) in group III .The difference in need of ET was not statistically significant among the three groups. 2 babies in group I, 1 baby in group II and 3 babies in group III required two exchange transfusions.

Discussion

Need for phototherapy and duration of phototherapy

Out of 64 babies in group I, 50 babies in group II and 50 babies in group III who survived for 2 days, 41 required PT in group I, 39 required in group II and 43 required in group III (**Table 2**). The difference between group I and III (p =0.007) were statistically significant but was not significant between group II and III. (p=0.39). The mean duration of PT were 82.05 hours, 120.26 hours and 132.81 hours in group I, II and III respectively. Again the difference between group I and III were significant (P<0.0001) but was not significant between group II and III (P=0.20).

Conclusion

From comparing above studies it was clear that PB starting early in life with loading dose was much more effective in decreasing the need and duration of PT.

Ethical Approval

Ethical Approval was given by the Hospital Ethics Committee of the Deen Dayal Upadhay Hospital Ehics Committee for Research and Thesis Approval.

Consent

Informed Written Consent was obtained from each parent of the babies before enrolling in the study.

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