

## Maternal factors affecting Neonatal Jaundice in Saurashtra region of Gujarat



### Medical Science

**KEYWORDS :** neonatal jaundice; birth order; mode of delivery

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### ABSTRACT

**Objectives:** Various Maternal factors are found to be associated with neonatal jaundice which is commonly observed in large number of neonates. Yet the role of these factors in causation of neonatal jaundice is not well established. As a result, study was conducted to analyze role of these factors in neonatal jaundice.

**Material and methods:** 50 neonates with neonatal jaundice with serum bilirubin level  $>5\text{mg}\%$  were examined for presence of these factors and its association with level of total serum bilirubin was studied. Neonates with total serum bilirubin  $<5\text{mg}\%$  and with severe congenital malformation like anencephaly or hydrocephalus were excluded.

**Observations:** Birth order and mode of delivery were found to be associated ( $p < 0.05$ ) with level of total serum bilirubin in neonatal jaundice while place of delivery was not associated ( $p > 0.05$ ) with level of total serum bilirubin. Factors like mode of delivery as LSCS and first birth order were found to be highly significant in present study.

### INTRODUCTION

Most jaundice is benign, but because of the potential toxicity of bilirubin, newborns must be monitored to identify those who might develop severe hyperbilirubinemia and, in rare cases, acute bilirubin encephalopathy or kernicterus [1]. Signs of Neonatal Jaundice are seen within the first three days of birth in 80% of preterm babies and 60% of full-term infants. Data from NNPD (National Neonatal Perinatal Database- 2002-03 report) the incidence of neonatal hyperbilirubinemia ( $>15\text{mg/dl}$ ) is 3.3%. Numbers of factors associated with neonatal jaundice are suggested by some authors and research articles [2-11]. So attempt was made to find factors which tend to associate with it in hospital at Saurashtra region and thus altering management protocol and its duration.

### MATERIALS AND METHODS

The present study includes analysis of clinical evaluation of 50 neonates. Approval from Institutional Ethical Committee (IEC) was taken before starting study.

Neonates with both conjugated and unconjugated hyperbilirubinemia admitted at Neonatal intensive care unit (NICU) in paediatric department in Shri GuruGobind Hospital (tertiary care hospital), Jamnagar from May 2010 to May 2011 were included.

Those neonates with clinically visible jaundice and with total serum bilirubin  $> 5 \text{ mg}\%$  (as per AAP-American Academy of Pediatrics guidelines, 2004) were considered for study. Those neonates not having clinically visible jaundice, whose parents didn't give consent, with Total serum bilirubin  $< 5 \text{ mg}\%$  and with life threatening congenital malformations like hydrocephalus, anencephaly etc were excluded.

Information about place of delivery, birth order, mode of delivery were collected. Written informed consent was taken from all mothers/guardians.

Cases were divided based on total serum bilirubin levels (TSB) into Group A (TSB  $< 15 \text{ mg}\%$ ) and Group B (TSB  $\geq 15 \text{ mg}\%$ ) [12]. Serum Bilirubin was done by Diazo reagent method and quantitative analysis was done by Spectrophotometry. Venous Blood sample was collected from dorsum of feet or hand after suspecting clinical jaundice.

Statistical analysis was done by SPSS version 20.0.0. Chi square test was applied to study association of factors with Group A and/or B. ANOVA and Multivariate Analysis was done to observe significant, synergistic and independent risk factors for neonatal jaundice.  $p < 0.05$  was considered significant.

### RESULTS

**Table 1: MATERNAL AND NEONATAL FACTORS AFFECTING**

### NEONATAL JAUNDICE

	Group A		Group B		Total	
	N(%)	Avg	N(%)	Avg	N(%)	Avg
Birth Order						
First	3(6%)	11.7 $\pm$ 3.4	19(38%)	21.8 $\pm$ 4.5	22(44%)	20.4 $\pm$ 5.6
Second	10(20%)	11.1 $\pm$ 1.6	9(18%)	19.3 $\pm$ 2.9	19(38%)	15 $\pm$ 4.8
Third or higher	7(14%)	13.3 $\pm$ 1.8	2(4%)	17.4 $\pm$ 2.5	9(18%)	14.2 $\pm$ 2.5
MOD						
Vaginal	14(28%)	11.5 $\pm$ 2.0	12(24%)	18 $\pm$ 2.2	26(52%)	14.5 $\pm$ 4.0
LSCS	5(10%)	12.8 $\pm$ 2.4	18(36%)	22.6 $\pm$ 4.2	23(46%)	20.5 $\pm$ 5.6
Forceps	1(2%)	14.7	-	-	1(2%)	14.7
Total	20(40%)	12 $\pm$ 2.2	30(60%)	20.8 $\pm$ 4.2	50(100%)	17.2 $\pm$ 5.3

MOD= mode of delivery, LSCS= lower segment caesarian section

Primi mothers were having higher chances of neonates with neonatal jaundice (44% of cases) and also TSB level was higher in neonates who were first born ( $20.4 \pm 5.6$ ) compare to neonates of multipara mothers. Also strong association was found between Group A and B ( $p < 0.005$ ) with birth order i.e. lower the birth order higher TSB level and vice versa.

Strong association was found between Group A and B with mode of delivery indicating higher chances of neonatal jaundice with high TSB in neonates born by LSCS. TSB level was higher ( $20.5 \pm 5.6$ ) in neonates who were delivered by LSCS as compared to those delivered by normal vaginal delivery ( $14.5 \pm 4.0$ ).

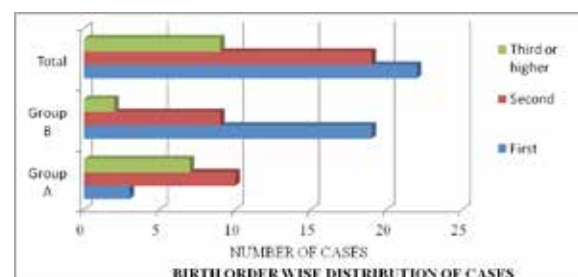


Figure 1: Influence of birth order on group A and B of neonatal jaundice

Place of delivery (Hospital-delivered or Home-delivered) and etiological profile was not influencing TSB level ( $p > 0.05$ ). Neonates with high TSB required longer duration of Phototherapy or Exchange transfusions compared to neonates with low TSB level as more duration is required for geometric isomerisation or removal of bilirubin in high TSB levels.

**DISCUSSION**

Higher TSB level in first born neonates with increase frequency of neonatal jaundice in them indicate strong influence of para-gravida on neonatal jaundice and its TSB level. Reason for it is difficult to explain but may be due to racial, climatic or dietary influences in Saurashtra region.

LSCS as mode of delivery was found to significantly influencing development of neonatal jaundice. Shally Awashti [7] et al and Shivani Randev [8] et al also showed similar findings.

ANOVA showed very significant influence of parity ( $p=0.003$ ) and type of delivery ( $p=0.001$ ). Multivariate analysis revealed both factors as synergistic as well as independent risk factors

for neonatal jaundice (parity  $\beta=0.369$ , type of delivery  $\beta=0.428$ ).

**CONCLUSIONS**

Present study proves influence of parity and LSCS as risk factors of neonatal jaundice. A precautionary step taken in Primi mothers thus can prevent neonatal jaundice in large number of cases. Also if LSCS is performed prophylactic phototherapy if performed will prevent development of jaundice in neonates.

However other factors still do affect development of jaundice and thus needs further consideration. As sample size is small it act as limiting factor and thus require further investigation in influence of these factors in development of neonatal jaundice.

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