

Analysis of Prevalence of Neonatal Jaundice Among Young Children in a Tertiary Hospital in India

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ABSTRACT

Introduction: Hyperbilirubinemia is a common problem during the neonatal period occurring in up to 60% of term and 80% of preterm babies in the first week of life. Risk factors that are mostly being reported to be associated with severe hyperbilirubinemia in new-borns have jaundice in the first 24-hours of life. The aim of the study was to analyse the prevalence of neonatal jaundice among young children reported in tertiary care hospital.

Materials and Methods: The study location was Department of Paediatrics, Hi-Tech Medical College & Hospital, Bhubaneswar, Odisha, India. The target population consist of neonates hospitalized at NICU in a proposed time period. This is designed as a retrospective descriptive study of analysing the causes of mortality among new-borns.

Results: Of the total 650 inborn admitted, the prevalence of neonatal jaundice was 15% (55.2% Male and 44.8% Female). Majority of the mothers (89.2%) lived within town, while 20.7% of the new-born are Preterm. More than half of the neonates had normal birth weight and 39% have low birth weight. There were no statistically significant associations derived between male and female sex ($p=0.702$). There were statistically significant associations derived between babies born at term and babies born premature ($p=0.003$).

Conclusion: The prevalence of neonatal jaundice is reported to be similar in previous studies which was conducted in developing countries. The occurrence of neonatal jaundice and other neonatal mortalities cannot be seen as void as it is notable that healthcare workers detect the contributing factors to neonatal mortality and proper management of neonatal jaundice. Proper health education should also be given to mothers on neonatal Jaundice for the early identification and management.

Keywords: Children; Hyperbilirubinemia; Neonatal Jaundice.


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INTRODUCTION

Hyperbilirubinemia is a most frequently encountered problem in the neonatal period. This neonatal jaundice is quantified to occur in almost 60% of term new-borns in the first week of life,¹ and in less than 2% the serum bilirubin level (TSB) might reach 20 mg/dL.² In quite rare situations, the TSB reaches to certain levels that can result in kernicterus which is a condition manifested by bilirubin staining of optic neurons and neuronal necrosis most commonly involving the basal ganglia of the brain and clinically throws in athetoid cerebral palsy, hearing loss, dental dysplasia and paralysis of upward gaze.³ Risk factors that are mostly being reported to be associated with severe hyperbilirubinemia in new-borns have jaundice in the first 24-hours of life.

Glucose-6-phosphate dehydrogenase (G6PD) deficiency, ABO incompatibility, low birth weight and sepsis are the common aetiological factors of neonatal jaundice that had been observed in Asian and South-east Asian regions, but there is a group of babies

whose cause of neonatal jaundice has still reported to be vague and unclear. Genetic factors and unidentified environmental factors might also play a key role in the prevalence of neonatal jaundice.⁴ Glucose 6-phosphate dehydrogenase (G6PD) deficiency is the most important metabolic condition of hexose monophosphate pathway. G6PD is found to be a x-linked recessive disease, where the deficiency of the enzyme results in a spectrum of clinical signs and symptoms which ranges from neonatal jaundice to chronic non-spherocytic anaemia and drug-induced haemolysis.⁵ Special Care Baby Unit (SCABU) is a neonatal intensive care unit (ICU), was observed that incidence of neonatal jaundice was reportedly 23.5% and among them about 17% required exchange haematological transfusion.⁶ Recognising infants at risk of developing severe hyperbilirubinemia and early treatment strategies have greatly minimised the levels of morbidity and mortality often related with bilirubin encephalopathy.

In the past decades, there have been many studies that have reported neonatal jaundice as a key contributor to neonatal morbidity and mortality.⁶

But due to the lack of harmonized protocols for the effective management and classification of jaundice in low-and middle income countries, comparison of jaundice across different locations has been proven to be difficult.⁷ According to a world survey, about 1.1 million new-borns would seriously develop severe jaundice annually and majority of them would possibly residing in the sub-Saharan Africa and South Asia.⁸ Neonatal jaundice is the leading cause of illness and death related with new-borns in Africa particularly in West Africa and needs to be prioritized with global intervention.⁹

MATERIALS AND METHODS

The study location was Department of Paediatrics, Hi-Tech Medical College & Hospital, Bhubaneswar, Odisha, India. The target population consist of neonates hospitalized at NICU in a proposed time period. This is designed as a retrospective descriptive study of analysing the causes of mortality among new-borns who are admitted in the tertiary care hospitals. After obtaining proper approval from the Ethical and Research Committee. The information notes of all patients were reviewed and information to be retrieved with include maternal address (inside or outside town), age on admission, duration of hospital stay, weight at birth, nature of ailment and diagnosis at time of death (not primary cause of death).

Table 1: Neonates baseline information

Parameters	Frequency	% (n=650)
Maternal details		
Within town	579	89.2
Outside town	71	10.8
Prevalence of jaundice	98	15
Sex		
Male	359	55.2
Female	291	44.8
Preterm	135	20.7
Period of admission		
1 st	168	25.9
2 nd	146	22.5
3 rd	168	25.9
4 th	167	25.7
Birth weight		
Low	254	39
Normal	322	49.6
High	74	11.4

Table 2: Factors Associated with Neonatal jaundice

Parameters	Jaundice		P - value
	Yes	No	
Address details			
Within town	111 (17.2%)	459 (82.8%)	0.257
Outside town	10 (12.5%)	70(87.5%)	
Sex			
Male	61 (17.1%)	294 (82.8%)	0.702
Female	49 (16.6%)	246 (83.4%)	
Age at birth			
Term	60 (12.6%)	415 (87.4%)	0.003
Preterm	42 (24%)	133 (76%)	
Weight details			
Low birth weight	33 (13.4%)	213 (86.4%)	0.000
Normal birth weight	72 (21.4%)	263 (78.6%)	
Overweight	3 (4.3%)	66 (95.7%)	

RESULTS

As represented in Table 1, of the total 650 inborn admitted, the prevalence of neonatal jaundice was 15% (55.2% Male and 44.8% Female). Majority of the mothers (89.2%) lived within town, while 20.7% of the new-born are Preterm. More than half of the neonates had normal birth weight and 39% have low birth weight. The neonate average age at admission is 1.81 ± 4.501 days. The neonates admitted also had an average weight of 2.77 ± 0.92 kg, average body length of 3.71 ± 3.651 cm and the average head circumference of 33.49 ± 4.55 cm and average hospital stay duration of 4.4 ± 4.57 days.

There were no statistically significant associations derived between babies delivered in town and those delivered outside of town ($p=0.257$). However, babies born within town are 1.601 times more likely to develop jaundice than those born outside of town. There were no statistically significant associations derived between male and female sex ($p=0.702$). There were statistically significant associations derived between babies born at term and babies born premature ($p=0.003$). Babies born in the first half of the year were 1.665 more likely to have neonatal jaundice than babies born in the second half. There were statistically significant

associations derived between weight of babies and development of Jaundice. The prevalence of Jaundice in Low birth weight (29.0%) and Normal weight babies (69.9%) were higher than in Over-weight babies (1.1%).

DISCUSSION

It has been observed that neonatal jaundice is majorly responsible for inpatient admissions, morbidity and mortality among the neonates from a country-wide survey conducted in Myanmar.^{10,11}

There were slightly more jaundiced male neonates than female as observed in this study (55.2% male and 44.8%); but, this is in contrary to the earlier studies where it was observed that male gender is observed to be as one of the major predisposing factors for neonatal jaundice.¹² Based on a study, the male gender has a lower level of Glucose-6-phosphate dehydrogenase deficiency (G6PD) than their counterpart which has been postulated that the defect is X-linked recessive which results in the male gender having increased tendency to have Neonatal jaundice than females.¹³

This study results revealed that the mean age on admission of the neonates with jaundice was 3.91 days compared with babies with other pathologies of 1.41 days which is in agreement with 3.44±2.50 days in a study conducted Chime HE et al.⁹

Majority of the neonates that were found to be jaundiced in this study were admitted in the early stage of their lives as given in table 2. This implies that neonatal jaundice is frequently detected by caregivers after child delivery. Hence, the possibility of neonate after receiving proper care early enough is basically dependent on the ability to identify the disease early enough. Neonates born at term were 3.151 more likely to develop neonatal jaundice than those born premature. This finding agrees with the report of Selvaraju S¹¹ that neonatal jaundice was greater among term neonates than preterm neonates. This might be attributed because of the assumption that NNJ reported among term neonates is more physiological in nature which has led to the failure in order to consider the pathological risk factors that are associated with.¹⁴

One of the leading aetiologies of neonatal jaundice is early discharge of neonates which frequently resulted in the readmission of neonates who are prone to develop jaundice in the later stages.¹⁵

Findings observed from this study incurs that there was no statistically significant relation between the prevalence of jaundice and length of hospital stay ($p=0.185$) as neonates with jaundice had a relatively shorter length of hospital stay than other neonates admitted with other pathological conditions.

A review across western countries reported that shorten length of hospital stay was as a result of containment charge and availability of hospital bed.¹⁶

CONCLUSION

The prevalence of neonatal jaundice is reported to be similar in previous studies which was conducted in developing countries. The occurrence of neonatal jaundice and other neonatal mortalities cannot be seen as void as it is notable that healthcare workers detect the contributing factors to neonatal mortality and proper management of neonatal jaundice. Proper health education should also be given to mothers on neonatal Jaundice for the early identification and management.

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