TREATMENT PROFILE AND ETIOLOGY OF NEONATAL JAUNDICE IN NEWBORN ADMITTED IN A TERTIARY CARE CENTRE OF NEPAL

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ABSTRACT

Neonatal jaundice is a yellowish discoloration of sclera and skin in a newborn baby due to increase bilirubin levels. Complication may include neonatal seizures, cerebral palsy (CP) or kernicterus. Cause of jaundice could be physiological or pathological but the need of treatment depends on serum bilirubin levels, postnatal age of baby and the underlying cause. This was a hospital based retrospective cross-sectional study of neonates admitted at Nepal Medical College Teaching Hospital during the period of January 2022 to Dec 2023. A total of 4,113 deliveries was conducted during the study period. Out of them, a total 1,031 newborns were admitted out of which 157 neonates (15.22%) had significant hyperbilirubinemia. Among them, 53.5% were male and 46.5% were female babies. Regarding the gestational age, 32 (20.38%) babies were preterm and 125 (79.62%) were full term. Common causes of hyperbilirubinemia were physiological jaundice 79 (50.32%) followed by sepsis 27 (17.20%), prematurity 22 (14.01%), infant of diabetic mother 16 (10.20%), birth asphyxia 3 (1.91%), 5 (3.2%) of intrauterine growth restriction cases, 4 (2.54%) and 1 (0.63%) were due to blood group (ABO and Rh) incompatibility, respectively. Phototherapy was given to 100.0% (157) of the babies. None of the case required exchange transfusion. All babies were discharged after treatment as general condition of babies were good.

KEYWORDS

Neonatal jaundice, physiological jaundice, hyperbilirubinemia, sepsis

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INTRODUCTION

Jaundice is common problem in the neonatal period especially in the first week of life leading to hospitalization. Jaundice is a cause of concern and worrisome for the parents. As reported by Prasad *et al*,[1] neonatal hyperbilirubinemia was seen in 60.0% of term babies and 80.0% of preterm babies during the first week of life. Physiological jaundice appears between 30-72 hours after birth and eventually disappears on 10th day of life and according to them various reasons and risk factors are associated with jaundice.[1-3] Common causes of neonatal jaundice are physiological jaundice, breast feeding/milk jaundice, prematurity and pathological causes like hemolytic disease e.g. Rh incompatibility, ABO incompatibility, neonatal sepsis, hypothyroidism etc.[1,2,4-7]

Many changes were introduced in the management of neonatal hyperbilirubinemia. Hour-specific monogram for predicting neonatal hyperbilirubinemia was introduced by Bhutani *et al*,[8] and Maisles *et al*,[9] which was also supported by American Academy of Pediatrics. Hyperbilirubinemia in newborn is defined as the need for phototherapy according to the American Academy of Pediatrics (AAP) guidelines.[10]

Since hyperbilirubinemia is potentially toxic to the central nervous system, the lack of early detection and appropriate treatment of neonatal jaundice may lead to permanent neuronal injury. It accounted for 1309 deaths per 100,000 livebirths in 2016 and ranked seventh globally among all causes of neonatal deaths in the first week of life.[11] The disease burden is greatest in sub-Saharan African and south Asia where jaundice was the eight and seventh leading cause of neonatal mortality, respectively.[11] Therefore, this paper reports the treatment profile and various etiology of neonatal jaundice among newborn admitted at a tertiary care centre of Nepal.

MATERIALS AND METHODS

This was a hospital record-based retrospective study of neonates admitted at Nepal Medical College Teaching Hospital (NMCTH) from January 2022 to Dec 2023. Ethical approval for the study was taken from the Institutional Review Committee of NMCTH. All the jaundiced neonates who required phototherapy as reported by Bhutani *et al*,[8] were included in the study. Case records of all newborn were evaluated for details of the mode of delivery, gestational age of baby, birth weight, gender, birth asphyxia, ABO and Rh incompatibility, sepsis, gestational diabetes mellitus, treatment profile, etiology and outcome of jaundiced neonates and these were recorded. Data were entered in Microsoft Excel and were analyzed using SPSS-18 and frequencies and distributions were calculated.

RESULTS

In this study, among 1031 admitted neonates, 157 (15.22%) had significant hyperbilirubinemia. Among them, 53.5% (84/157) were male and 46.5% (73/157) were female (Table 1). Regarding the gestational age 20.38% (32/157) babies were preterm whereas 79.62% (125/157) were full term babies. Regarding delivery, 53.5% (84/157) had the history of normal vaginal delivery and 46.5% (73/157) cases were born via Caesarean section. Most of neonates about 73.9% (116/157) with hyperbilirubinemia were having birth weight between 2500-3500 gram.

Table 1: Baseline characteristics of the study neonates

Parameters	N	%
Sex		
Male	84	53.5
Female	73	46.5
Birth weight in Kg		
<2.5	24	15.3
2.5 – 3.5	116	73.9
>3.5	17	10.8
Mode of delivery		
Normal vaginal delivery (NVD)	84	53.5
Lower segment cesarean section (LSCS)	73	46.5
Gestation		
Preterm (<37 weeks)	32	20.4
Term (>37 weeks)	125	79.6

Table 2: Aetiology of jaundice

Aetiology	N	%
Physiological jaundice	79	50.32
Sepsis	27	17.20
Prematurity	22	14.01
Infant of diabetic mother	16	10.20
Birth asphyxia	3	1.91
Intrauterine growth restriction	5	3.2
ABO incompatibilty	4	2.54
Rh incompatibilty	1	0.63

Among various causes of hyperbilirubinemia, physiological jaundice was seen in 79 neonates (50.32%), 27 (17.20%) were having sepsis, prematurity 22 (14.01%), 3 (1.91%) were due to birth asphyxia, Infant of diabetic mother 16 (10.20%), 5 IUGR cases (3.2%), 4 (2.54%) and 1 (0.63%) were due to blood group (ABO and Rh) incompatibility, respectively (Table 2).

Phototherapy was given to 100.0% (157) of the babies. All babies recovered after phototherapy and were discharged from the neonatal unit of the hospital as general condition of babies were healthy. None of the case required exchange transfusion.

DISCUSSIONS

There is a crucial need to develop social awareness and educating parents to reduce readmission, severity in neonates to avoid complications and death. In the present study the prevalence of neonatal hyperbilirubinemia was 15.22%. The prevalence was higher than the prevalence of neonatal hyperbilirubinemia in the same institute from 2005 to 2008, which was reported as 10.5%.[5] It could be due to difference in sample size. However, higher prevalence of neonatal hyperbilirubinemia (52.0%) has also been reported by Olatubi *et al*,[12]. On the other hand, low prevalence (4.08%) has been reported by Yaha *et al*.[13]

The study showed male babies (53.5%) to be more affected than female babies (46.5%) which is comparable with other studies like Zabeen *et al*,[6] Nepal *et al*,[8] Olatubi *et al*,[12] and Abbas *et al*.[13] Male predominance may be due to social biasness regarding taking care of male babies in our society.[4] As stated by Tioseco *et al*,[14] "Y" chromosome in male babies increases the risk of disorder in bilirubin metabolism and enzymes responsible for formation of bilirubin. The other study showed the incidence to be more in female (55.0%) than male babies (44.0%).[7]

This study showed around 53.5% of babies were delivered through normal vaginal delivery who were affected with jaundice when compared with cesarean section (46.5%). Physiological jaundice (50.32%) was the most common type of jaundice seen in newborns which was consistent with the findings of Roma *et al*.[4] The other causes of neonatal jaundice were sepsis (17.20%), prematurity (14.01 %), infant of diabetic mother (10.20%), birth asphyxia (1.91%), ABO (2.54%) and Rh (0.63%) incompatibility. These finding were in agreement with the findings reported by Prasad *et al*,[1] Rithanya *et al*,[2] Roma *et al*,[4] Rijal *et al*,[5] and Zabeen *et al*.[6]

In the present study, phototherapy was the common treatment modalities in such neonates as reported by Bhutani *et al*.[8] There are other pharmacological treatments to reduce neonatal jaundice includes phenobarbitone, clofibrate, bile salts, laxative, indole-3- carbinol and bilirubin oxidase which are under clinical trial.[2] In this study, the exchange transfusion was not done due to the lack of occurrence in the critical serum bilirubin levels in neonates.

In our study, prevalence of neonatal hyperbilirubinemia was found to be 15.22%. The common causes of jaundice were physiological, sepsis, prematurity, infant of diabetic mother, birth asphyxia, ABO and Rh incompatibility required only phototherapy. Though small size and retrospective study are the limitations of present study.

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REFERENCES

1. Prasad R, Joshi BD, Singh R, Mahato D. A clinico-laboratory profile of neonatal hyper-bilirubinemia in term babies at BP Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal. *J Nepal Health Res Coun* 2004; 2: 28-30.
2. Rithanya S, Sheela D. A treatment profile of neonatal hyper-bilirubinemia in a tertiary health care hospital. *Biomed Pharma J* 2019; 35: 1235-9.
3. Kulkarni SK, Dolas AL, Doibale MK. Risk factors of neonates with indirect hyperbilirubinemia in a tertiary care hospital. *Int'l J Basic Appl Med Sci* 2014; 4: 395-9.
4. Roma KM, Kanodia P, Pyakurel M, Gupta V. A study of neonatal hyperbilirubinemia in mid-western part of Nepal. *J Nepalgunj Med Coll* 2017; 1; 15: 41-3.
5. Rijal P, Bichha RP, Pandit BP, Lama L. Overview of neonatal hyperbilirubinemia at Nepal Medical College Teaching Hospital. *Nepal Med Coll J* 2011; 1; 13: 205-7.
6. Zabeen B, Nahar J, Nabi N et al. Risk factors and outcome of neonatal jaundice in a tertiary hospital. *Ibrahim Med Coll J* 2010; 4: 70-3.
7. Yahya N, Yuniati T, Lubis L. Characteristics of neonatal hyperbilirubinemia at West Java's Top

referral hospital, Indonesia. *Althea Med J* 2017; 4: 167-72.

8. Nepal D, Banstola D, Dhakal AK, Mishra U, Mahaseth C. Neonatal hyperbilirubinaemia and its early outcome. *J Inst Med Nepal* 2009; 31: 17-20.
9. Maisles MJ, Balter RD, Bhutani V. Management of hyperbilirubinaemia in the newborn infant 35 or more weeks of gestation. *Pediatr* 2004; 114: 297-316.
10. Burke B, Robbins J, Hobbs C. American Academy of Pediatrics Subcommittee on hyperbilirubinemia management of hyperbilirubinemia in the newborn infant 35 or more weeks of gestation. *Pediatr* 2004; 114: 297-316.
11. Olusanya BO, Kaplan M, Hansen TW. Neonatal hyperbilirubinaemia: a global perspective. *Lancet Child Adolesc Health* 2018; 2: 610-20.
12. Olatubi ML, Ibitoye OF, Sadibo O, Bolarinwa OS, Adamolekun MM. Prevalence of neonatal jaundice at a tertiary health institution in Ondo state, Nigeria. *J Pre-Clin Clin Res* 2019; 13.
13. Abbas H, Hassan S, Arif K, Zameer S, Ahmed N, Haq AA. Neonatal hyperbilirubinemia: a retrospective study. *J Saidu Med Coll* 2020; 10.
14. Tioseco JA, Aly H, Milner J, Patel K, El-Mohandes AA. Does gender affect neonatal hyperbilirubinemia in low-birth-weight infants? *Pediatr Crit Care Med* 2005; 6: 171-4.
15. Tikmani SS, Warraich HJ, Abbasi F, Rizvi A, Darmstadt GL, Zaidi AK. Incidence of neonatal hyperbilirubinemia: a population-based prospective study in Pakistan. *Trop Med Int'l Health* 2010; 15: 502-7.
16. Mitra S and Rennie J. Neonatal jaundice: aetiology, diagnosis and treatment. *Brit J Hosp Med* 2017; 78: 699-704.
17. Oppong J, Ampofo H, Boakye-Danquah C *et al*. Prevalence and risk factors associate with neonatal jaundice at Cape Coast Teaching Hospital (CCTH), Cape Coast. *Int J Innovat Res Adv Studies* 2019; 6:1-6.
18. Wells C, Ahmed A, Musser A. Strategies for neonatal hyperbilirubinemia: a literature review. MCN: *Amer J Maternal/Child Nurs* 2013; 38: 377-82.
19. Yu ZB, Han SP, Chen C. Bilirubin nomograms for identification of neonatal hyperbilirubinemia in healthy term and late-preterm infants: a systematic review and meta-analysis. *World J Pediatr* 2014; 10: 211-8.
20. Olusanya BO, Osibanjo FB, Slusher TM. Risk factors for severe neonatal hyperbilirubinemia in low and middle-income countries: a systematic review and meta-analysis. *PlOS One* 2015; 10: 0117229.
21. Farouk ZL, Usman F, Musa BM, Ezeaka VC, Okolo A. Societal awareness on neonatal hyperbilirubinemia: a systematic review and meta-analysis. *Sem Perinat* 2021; 45: 151361.
22. Slusher TM, Zamora TG, Appiah D *et al*. Burden of severe neonatal jaundice: a systematic review and meta-analysis. *BMJ Pediatr Open* 2017; 1.
23. Slusher TM, Zipursky A, Bhutani VK. A global need for affordable neonatal jaundice technologies. *Sem Perinat* 2011; 35: 185-191.
24. Boskabadi H, Rakhshanizadeh F, Zakerihamidi M. Evaluation of maternal risk factors in neonatal hyperbilirubinemia. *Arch Iranian Med* 2020; 23: 128-40.
25. Oppong J, Ampofo H, Boakye-Danquah C *et al*. Prevalence and risk factors associate with neonatal jaundice at Cape Coast Teaching Hospital (CCTH), Cape Coast. *Int'l J Innovat Res Adv Stud* 2019; 6: 1-6.