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Original Research Article

Study of aetiological factors and clinical profiles of neonatal jaundice in the special newborn care unit of tertiary care hospital of Government Medical College, Rajouri, Jammu and Kashmir union territory: a hospital-based study

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ABSTRACT

Background: Neonatal hyperbilirubinemia may be physiological or pathological. Neonatal hyperbilirubinemia is a common condition requiring inpatient treatment and monitoring and many time requires readmission to hospital. Estimated incidence of jaundice in neonates is 60% to 84% of late term and term infants. Present study was undertaken to study clinical profile of neonates with jaundice at our tertiary care centre.
Methods: This prospective observational study was conducted in neonates with jaundice admitted in SNCU ward during study period with serum bilirubin more than 10 ml/dl.
Results: During study period 339 neonates were considered for presented study. 192 newborns (56.63%) developed jaundice after 72hrs. of birth. Only 28.90% newborns developed jaundice within 24 hrs. Of birth. 61.65% babies were male as compared to 38.34% female babies. Jaundice was most commonly noted in babies delivered at more than 34 weeks gestational age (60.17%), while only 10.02% babies were delivered between 28-32 weeks gestational age. 2500-4000 gm birth weight babies were 60.14% while only 39.82% babies had weight less than 2500 gms. Incidence of neonatal jaundice was 60.06%, 30.38%, 08.55% in vaginal, caesarean section and instrumental delivery respectively. Physiological jaundice (30.67%), prematurity (25.30%), Rh incompatibility (10.91%), breast feeding/jaundice (10%), ABo incompatibility (6.19) and idiopathic (5.01%) were most common causes noted in our study.
Conclusions: Male gender, 2500-4000 gm birth weight, vaginal delivery, physiological delivery, prematurity were common causes associated neonatal jaundice in our study. Parent counselling and monitoring of baby is most important in management of neonatal jaundice.

Keywords: Neonatal jaundice, Physiological, ABo incompatibility, Rh incompatibility, Idiopathic

INTRODUCTION

Jaundice is the most common problem in the first week of life worldwide. It is observed in 60% of full-term infants and 80% of preterm infants in the first week.[1] Jaundice is also the commonest reason for delayed hospital discharge and readmissions in the first week of life.[2,3]

Severe neonatal jaundice has the potential to cause bilirubin encephalopathy (kernicterus) which can evolve into chronic permanent neurological sequelae. Thus, survivors may suffer from severe neurological handicaps like cerebral palsy, gaze palsies and deafness. This sequel is irreversible, but can be prevented by early diagnoses and appropriate treatment of neonatal jaundice. For the

management to be appropriate, identification of the etiological and risk factors of paramount importance.

Jaundice is yellow discolouration of the skin and sclera that occurs when levels of bilirubin are increased. Bilirubin is a product of heme catabolism, and 80% to 90% of hyperbilirubinemia occurs due to the breakdown of haemoglobin. Neonatal hyperbilirubinemia occurs due to a variety of factors. It may be physiological or pathological. Physiologic hyperbilirubinemia is seen in neonates due to multiple factors such as an increased number of red cells with a shorter life span prone for haemolysis.[4,5]

Also, neonates have increased enter hepatic circulation due to decreased gastrointestinal tract motility during initial few days of life, causes bilirubin reabsorption. Physiologic volume restriction due to the low volumes of breast milk is also seen in neonates. Introduction of delayed cord clamping can also be a risk factor. Few pathological causes of hyperbilirubinemia in neonates are ABO incompatibility, rhesus in compatibility, sepsis, asphyxia, and exposure to haemolytic agents. However, the aetiology of neonatal hyperbilirubinemia may remain obscured in more than half of the cases.[6] Neonatal hyperbilirubinemia is a common condition requiring inpatient treatment and monitoring, and many times requires readmission to hospital.[7] Estimated incidence of jaundice in neonates is 60% to 84% of late term and term infants.[8]

5–10% of the new-born with jaundice need to be treated due to pathological hyperbilirubinemia, but risk of neurologic damage always remains, especially with very high bilirubin level, in presence of certain risk factors and in cases where management remains inappropriate.[9]

Since multiple management protocols are adapted to reduce incidence of neonatal jaundice such as early initiation of breast feeding, anti-D prophylaxis to prevent Rh D disease, effective phototherapy, exchange transfusion, and intravenous immunoglobulin for treatment of hyperbilirubinemia, neonates presenting with severe hyperbilirubinemia and bilirubin encephalopathy are not uncommon.

Objectives

The objective of this study was to study the clinical profile and the underlying aetiological factors leading to neonatal jaundice in this rural setting.

METHODS

This prospective, observational study was conducted in department of paediatrics GMC Rajouri. Total study duration was of 12 months (from April 2021 to March 2022). Proper approval was taken from institutional ethical committee.

Inclusion criteria

Neonates with jaundice admitted in NICU or neonatology ward during study period, with serum bilirubin more than 10 mg/dl were included.

Exclusion criteria

Neonates with jaundice not admitted in NICU, attending outpatient department only, neonates with jaundice who opted discharge against medical advice, parents of neonates not willing to participate in this study were excluded.

Purpose of the present study was explained to the parents and a written informed consent was taken for their participation. Detailed history was taken for all the babies along with maternal antenatal and delivery details.

Clinical examination was done with special attention for assessment of severity of jaundice. Examination was done in natural day light in a white background. Laboratory investigations such as total serum bilirubin and its fraction, blood groups (Rh and ABO) for both jaundiced new-born and mother were done for each patient.

Other tests like direct Coombs test, G6PD screen, reticulocyte count, haematocrit, sepsis screening etc. were done when needed. Follow up was kept till 30 days of neonatal age. Data was collected in a predesigned format and analysed accordingly.

RESULTS

During study period 339 new-borns were considered for present study, as they were satisfying inclusion and exclusion criteria. 192 new-borns (56.63%) developed jaundice after 72 hours of birth. Only 28.90% developed jaundice within 24 hours of birth. 61.65% babies were male as compared to 38.39% female babies. Surprisingly neonatal jaundice was most commonly noted in babies delivered at more than 37 weeks gestational age (60.17%), while only 10.02% babies were delivered between 28-32 weeks gestational age. 2500-4000 gm birthweight babies were 60.17%, while 39.82% babies had birthweight less than 2500 gm. Incidence of neonatal jaundice was 60.06%, 30.38% and 8.55% in vaginal delivery, caesarean section, instrumental delivery respectively (Table 1).

Physiological jaundice (30.67%), prematurity (25.36%), breast feeding (10.02%), idiopathic (5.01%), were most common causes noted in our study. Less common causes noted in our study were ABO incompatibility (06.91%), sepsis (03.83%), Rh incompatibility (10.91%), cephalhematoma (4.42%), haemolytic anemia (1.17%), G6PD deficiency (0.88%), and hypothyroidism (1.47%) (Table 2).

Yellowish discolouration with good activity (24.77%), Jaundice with refusal of feeds (30.08%) were most

common symptoms noted. History of delayed cry (17.69%), fever (13.86%), and vomiting (13.56%) symptoms were noted in our study (Table 3).

Table 1: General characteristics.

Characteristics (total 339)	No. of newborns	Percentage
Age of onset of jaundice (hours)		
0-24	98	28.90
24-72	49	14.45
>72	192	56.63
Gender		
Male	209	61.65
Female	130	38.34
Gestational age at birth (weeks)		
28-32	34	10.02
33-36	101	29.79
>37	204	60.17
Birth weight (gm)		
<2500	135	39.82
2500-4000	204	60.17
>4000	NA	-
Mode of delivery		
Vaginal delivery	207	60.06
Instrumental delivery	29	8.55
C-section delivery	103	30.38

Table 2: Etiology.

Etiology	No. of newborn	Percentage
Physiological	104	30.67
Prematurity	86	25.36
Breast feeding	34	10.02
Idiopathic	17	05.01
Abo incompatibility	21	06.19
Sepsis	13	03.83
Rh incompatibility	37	10.91
Cephalhematoma	15	04.42
Haemolytic anemia	4	01.17
G6PD deficiency	3	0.88
Hypothyroidism	5	01.47
Total	100	

Table 3: Symptoms.

Symptoms	No. of newborns	Percentage
Yellowish discolouration with good activity	84	24.77
Jaundice with refusal of feeds	102	30.08
History of delayed cry	60	17.69
Fever	47	13.86
Vomiting	46	13.56

DISCUSSION

Neonatal jaundice is one of the most common causes of hospitalization of neonates in the first month after birth. In most cases, neonatal jaundice is transient and usually resolving at the end of the first week after birth. But when severe hyperbilirubinemia is present, there is a potential risk for acute bilirubin encephalopathy and kernicterus. This can lead to death in the first months, and infants who are still alive often suffer from mental retardation, movement and balance disorders, seizures, hearing loss at high frequencies, and speech impairment. So, timely diagnosis and treatment of neonatal jaundice are very important to prevent further complications. In our study, majority of the babies with neonatal jaundice were more than 37 weeks gestation (60.17%) and 10.02% were early preterm. Other studies found a higher percentage of premature babies admitted for neonatal jaundice in their studies.[10] Higher percentage of term babies in our study was mainly due to early pickup from postnatal wards, aggressive care for preterm babies, etc. Male gender is a known risk factor for hyperbilirubinemia.[11] Higher incidence of significant hyperbilirubinemia in male babies as compared to female babies was found in various other studies.[12]

In the present study 60.06% new-borns were delivered vaginally, 8.55% were instrumental deliveries and 30.38% were delivered by LSCS. Higher incidence of neonatal jaundice was associated with babies delivered vaginally compared to those born by LSCS. Similar findings are noted in various other studies.[13,14] Physiological jaundice was noted in 30.67% babies in our study and this is most common group. Normally some icterus appears on the second to third day, reaching its maximum on the second to fourth day and decreasing on the fifth to seventh days, mainly due to liver enzymes have not evolved enough. This jaundice is called physiologic jaundice. Various factors such as maternal diabetes, race, premature infant, medication use of mother, male gender, cephalohematoma, breastfeeding, weight loss, delayed stools in the baby may be correlated with physiologic jaundice.[15] Since most of these are normal physiological findings, it also increases overall contribution of physiological jaundice in cases of neonatal jaundice. Second most common cause was prematurity (25.36%), which is an important cause of neonatal hyperbilirubinemia and has been well documented in the literature.[9,16]

Breast milk jaundice occurs with the bilirubin level usually peaking in the 6th to 14th day of life which is later than physiological jaundice. This late onset jaundice may develop in up to one third of healthy breast-fed infants.[17] Postulated mechanism is that, beta glucuronidases and non-esterified fatty acids in maternal milk, may inhibit normal bilirubin metabolism.[18] We noted 5.01% babies with idiopathic aetiology. Various studies observed idiopathic cause as an aetiology in 15.5-25.4% cases.[19,20]

In our study we identified Abo incompatibility (06.19%) and Rh incompatibility (10.91%) as a risk factor for neonatal jaundice. Neonatal jaundice in babies with ABO incompatibility and Rh incompatibility is mainly due to haemolysis. These both are noted as a significant risk factor in many studies.[11,21]

Sepsis noted as a cause of neonatal jaundice in 03.83% babies and many studies also noted sepsis as a significant risk factor for jaundice.[22] Cephalhematoma (04.42%), haemolytic anemia (01.17%), G6PD deficiency (0.88%), hypothyroidism (01.47%) were least common causes noted in our study. Cephalhematoma is collection of blood, mostly due to injury during delivery, commonly instrumental delivery.

This is an avoidable cause. Jaundice in hemolytic anemia and G6PD deficiency is due to hemolysis mainly. Jaundice in hypothyroidism is mainly due to polycythemia seen in such cases.

CONCLUSION

Male gender, 2500-4000 gm birthweight, vaginal delivery, physiological jaundice, prematurity were common causes associated with neonatal jaundice in our study. Parental counselling and monitoring of baby is most important in management of neonatal jaundice. Though there is less incidence of progression to severe hyperbilirubinemia, complications associated to severe hyperbilirubinemia are dangerous.

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REFERENCES

1. Barabara JS, Kliegman RM. Jaundice and Hyperbilirubinemia in the new born. In: Kliegman RM, Behrman HB. Jenson HP, editors. Nelson textbook of paediatrics, 17th ed. Philadelphia: Elsevier Saunders. 2004;592-8.
2. Zipursky A, Blencowe H, Khanna R, Sgro M, Ebbesen F, Ebbesen F, et al. Neonatal newborn: incidence and impairment estimates for 2010 at regional and global levels. Pediatr Res. 2013;74(1):86-100.
3. Mwaniki MK, Atieno M, Lawn JE, Newton CRJC. Long-term neurodevelopmental outcomes after intrauterine and neonatal insults: A systematic review. Lancet. 2012;379:445-52.
4. 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(9):660-4.
5. Stokowski, Laura A. Fundamentals of phototherapy for neonatal jaundice. Adv Neonat Care. 2011;11.
6. Narang A, Kumar P, Kumar R. Neonatal jaundice in very low birth weight babies. Indian J Pediatr. 2001;68:307-9.
7. Escobar GJ, Greene JD, Hulac P, Kincannon E, Bischoff K, Gardner MN, et al. Rehospitalisation after birth hospitalisation: patterns among infants of all gestations. Arch Dis Child. 2005;90(2):125-31.
8. Kliegman RM, Stanton BMD, St Geme J, Schor NF, Behrman RE. Nelson Textbook of Pediatrics. 19th Edition. St Louis, MO: Elsevier Saunders. 2011.
9. Mishra S, Agarwal R, Deorari AK, Paul VK. Jaundice in the newborns. Indian J Pediatr. 2008;75:157-63.
10. Bhutani VK. On Evidence based issues regarding the neonatal hyperbilirubinemia. Paediatrics Rev. 2005;114:130-53.
11. Najib K, Saki F, Hemmati F, Inaloo S. Incidence, risk factors and causes of severe neonatal hyperbilirubinemia in South of Iran. Iran Red Cres Med J. 2013;15(3).
12. Pathak U, Chawla D, Kaur S, Jain S. Bilirubin nomogram for prediction of significant hyperbilirubinemia in north Indian neonates. Indian Pediatr. 2013;50(4):383-9.
13. Varvarigou A, Fouzas S, Skylogianni E, Mantagou L, Bougioukou D, Mantagos S. Transcutaneous bilirubin nomogram for prediction of significant neonatal hyperbilirubinemia. Pediatrics. 2009;124(4):1052-9.
14. Keren R, Bhutani VK, Luan X, Nihtianova S, Cnaan A, Schwartz JS. Identifying newborns at risk of significant hyperbilirubinaemia: a comparison of two recommended approaches. Arch Dis Child. 2005;90(4):415-21.
15. Stoll BJ, Kliegman RM. Jaundice and hyperbilirubinemia in the newborn. Nelson textbook of pediatrics. 19th ed. Philadelphia: WB Saunders. 2011;562-96.
16. Sarici SU, Serdar MA, Karkmaz A, Erdem G, Oran O, Tekinalp G, et al. Incidence, course and prediction of hyperbilirubinemia in near term and term newborns. Pediatrics. 2014;113(4):775-80.
17. Porter ML, Dennis BL. Hyperbilirubinemia in the term newborn. Am Fam Physician. 2002;65(4):599-606.
18. Gartner LM, Herschel M. Jaundice and breast-feeding. Pediatr Clin North Am. 2001;48:389-99.
19. Singh SK, Singh SN, Kumar M, Tripathi S, Bhriguvanshi A, Chandra T, et al. Etiology and clinical profile of neonates with pathological unconjugated hyperbilirubinemia with special reference to Rhesus (Rh) D, C, and E incompatibility: A tertiary care centre experience. Clin Epidemiol Global Health. 2016;4:95-100.
20. Heydarian F, Majdi M. Hydarian F, Majdi M. Severe neonatal hyperbilirubinemia; Causes and contributing factors leading to exchange transfusion at Ghaem Hospital in Mashhad. Acta Med Iran. 2010;48(6):399-402.

21. Shetty A, Kumar BS. A study of neonatal hyperbilirubinemia in a tertiary Care Hospital. Int J Med Sci Public Health. 2014;3:1289-92.
22. Kaplan M, Wong RJ, Sibley E, Stevenson DK. Neonatal jaundice and liver disease. 9th edition. Martine RJ, Fanaroff AA, Walsh MC, editors. Neonatal – Perinatal Medicine: Diseases of Fetus and Infant. Volume 2. St Louis: Elsevier Mosby. 2011;1443.

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