e-ISSN: 0975-5160, p-ISSN: 2820-2651

Available online on www.ijtpr.com

International Journal of Toxicological and Pharmacological Research 2023; 13(10); 245-249

Original Research Article

# A Hospital-Based Study to Assess the Clinical Profile of Neonates with Jaundice: A Descriptive Study

**Pawan Kumar Yadav**

Senior Resident, Department of Pediatrics, JLNMCH, Bhagalpur, Bihar, India

**Received: 12-05-2023 / Revised 20-06-2023 / Accepted 23-07-2023**
**Corresponding author: Dr. Pawan Kumar Yadav**
**Conflict of interest: Nil**

**Abstract:**

**Aim:** The aim of the present study was to assess the clinical profile of neonates with jaundice.

**Methods:** The descriptive study was conducted in the Department of Paediatrics. Total study duration was of 2 years. Total 800 neonates were admitted in NICU and post natal ward during this period. Out of them, 200 newborns were having jaundice (Serum bilirubin > 10 mg/dl). 200 cases in total were enrolled in the study.

**Results:** 116 neonates (58%) developed jaundice after 72 hours of birth. Only 39% developed jaundice within 24 hours of birth. 64% babies were male as compared to 36% female babies. Surprisingly neonatal jaundice was most commonly noted in babies delivered at more than 37 weeks gestational age (60%), while only 10% babies were delivered between 28-32 weeks gestational age. 2500-4000 gm birthweight babies were 62%, while 38% babies had birthweight less than 2500 gm. Incidence of neonatal jaundice was 60%, 32% and 8% in vaginal delivery, caesarean section, instrumental delivery respectively. Physiological jaundice (32%), prematurity (24%), breast feeding (10%), idiopathic (4%), were most common causes noted in our study. Less common causes noted in our study were ABO incompatibility (6%), sepsis (3%), Rh incompatibility (11%), cephalhematoma (6%), haemolytic anemia (1%), G6PD deficiency (0.50%), and hypothyroidism (4.50%). Yellowish discolouration with good activity (25%), Jaundice with refusal of feeds (30%) were most common symptoms noted. History of delayed cry (18%), fever (15%), and vomiting (12%) symptoms were noted in our study.

**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.

**Keywords:** Neonatal jaundice, Physiological, ABO incompatibility, Rh incompatibility, Idiopathic.



## Introduction

Neonatal jaundice is a very common condition worldwide occurring in up to 60% of term and 80% of preterm newborns. [1] It is one of the main reasons for neonatal admissions and morbidity especially during the first week of life. Jaundice in newborns can be physiological or pathological. Jaundice attributable to physiological immaturity of neonates to handle increased bilirubin production is termed as physiological jaundice. [2] The elevated bilirubin in newborns is due to the immature hepatic metabolism of bilirubin, the increased red blood cell turnover, and the shorter lifespan of red blood cells.

Pathological jaundice is defined as any newborns requiring either phototherapy or exchange transfusion for the treatment of jaundice. [2] Severe neonatal jaundice is defined as any pathological jaundice whose Total Serum Bilirubin (TSB) level falls above the exchange transfusion range3. The TSB level depends upon the age and gestation age of the baby. Neonatal jaundice may not be a major cause of mortality but is still an important cause of morbidity especially in developing countries. Severe neonatal jaundice can lead to serious and irreversible neurodevelopment consequences if not treated timely. Studies around the world have described various clinical profile and incidence of severe neonatal jaundice. The incidence of severe neonatal jaundice was found to be highest in low to middle income countries like in Southeast Asian region. The lowest incidence was found in more developed regions. [3,4] In 2016, neonatal death due to neonatal jaundice was ranked seventh globally among all causes of neonatal deaths. [4]

Survivors suffer from severe neurological handicaps, such as cerebral palsy, gaze palsies and deafness. [5,6] Sequela is not reversible but it is

prevented by early diagnosis and appropriate neonatal jaundice management. Identification of etiological and risk factors is of utmost importance for the management of neonatal jaundice. The neonatal jaundice's incidence, etiological and contributory factors vary according to ethnic and geographic differences. [7] As a result of racial, cultural and environmental differences, in developing countries, these factors may be different from those of developed nations. To identify additional risk factors that may be particular, the need for more robust epidemiological studies in low and middle income studies was highlighted. [8]

Neonatal hyperbilirubinemia is a common condition requiring inpatient treatment and monitoring, and many times requires readmission to hospital. [9] Estimated incidence of jaundice in neonates is 60% to 84% of late term and term infants. [10] 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. [11]

The aim of the present study was to assess the clinical profile of neonates with jaundice.

## Materials and Methods

The descriptive study was conducted in the Department of Paediatrics, JLNMCH, Bhagalpur, Bihar, India. Total study duration was of 2 years( Nov 2016 to October 2018). Total 800 neonates were admitted in NICU and post natal ward during this period. Out of them, 200 newborns were having jaundice (Serum bilirubin > 10 mg/dl). 200 cases in total were enrolled in the study.

### 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

**Table 1: General Characteristics**

| Characteristics | No. of newborns | Percentage |
|---|---|---|
| **Age of onset of jaundice (hours)** | | |
| 0-24 | 50 | 30 |
| 24-72 | 24 | 12 |
| >72 | 116 | 58 |
| **Gender** | | |
| Male | 128 | 64 |
| Female | 72 | 36 |
| **Gestational age at birth (weeks)** | | |
| 28-32 | 20 | 10 |
| 33-36 | 60 | 30 |
| >37 | 120 | 60 |
| **Birth weight (gm)** | | |
| <2500 | 76 | 38 |
| 2500-4000 | 124 | 62 |
| >4000 | NA | - |
| **Mode of delivery** | | |
| Vaginal delivery | 120 | 60 |
| Instrumental delivery | 16 | 8 |
| C-section delivery | 64 | 32 |

116 neonates (58%) developed jaundice after 72 hours of birth. Only 39% developed jaundice within 24 hours of birth. 64% babies were male as compared to 36% female babies. Surprisingly neonatal jaundice was most commonly noted in babies delivered at more than 37 weeks gestational age (60%), while only 10% babies were delivered between 28-32 weeks gestational age. 2500-4000 gm birthweight babies were 62%, while 38% babies had birthweight less than 2500 gm. Incidence of neonatal jaundice was 60%, 32% and 8% in vaginal delivery, caesarean section, instrumental delivery respectively.

**Table 2: Etiology**

| Etiology | No. of newborn | Percentage |
|---|---|---|
| Physiological | 64 | 32 |
| Prematurity | 48 | 24 |
| Breast feeding | 20 | 10 |
| Idiopathic | 8 | 4 |
| Abo incompatibility | 12 | 6 |
| Sepsis | 6 | 3 |
| Rh incompatibility | 22 | 11 |
| Cephalhematoma | 12 | 6 |
| Haemolytic anemia | 2 | 1 |
| G6PD deficiency | 1 | 0.50 |
| Hypothyroidism | 5 | 4.50 |
| Total | 200 | 100 |

Physiological jaundice (32%), prematurity (24%), breast feeding (10%), idiopathic (4%), were most common causes noted in our study. Less common causes noted in our study were ABO incompatibility (6%), sepsis (3%), Rh incompatibility (11%), cephalhematoma (6%), haemolytic anemia (1%), G6PD deficiency (0.50%), and hypothyroidism (4.50%).

**Table 3: Symptoms**

| Symptoms | No. of newborns | Percentage |
|---|---|---|
| Yellowish discolouration with good activity | 50 | 25 |
| Jaundice with refusalof feeds | 60 | 30 |
| History of delayed cry | 36 | 18 |
| Fever | 30 | 15 |
| Vomiting | 24 | 12 |

Yellowish discolouration with good activity (25%), Jaundice with refusal of feeds (30%) were most common symptoms noted. History of delayed cry (18%), fever (15%), and vomiting (12%) symptoms were noted in our study.

## Discussion

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. [12] Jaundice is also the commonest reason for delayed hospital discharge and readmissions in the first week of life. [13,14] 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 are 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. [15,16]

116 neonates (58%) developed jaundice after 72 hours of birth. Only 39% developed jaundice within 24 hours of birth. 64% babies were male as compared to 36% female babies. Similar results were observed in Narang et al [17], Effiong et al [18] and Korejo et al [19] studies in which majority of babies were males. Surprisingly neonatal jaundice was most commonly noted in babies delivered at more than 37 weeks gestational age (60%), while only 10% babies were delivered between 28-32 weeks gestational age. 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. [20,21] 2500-4000 gm birthweight

babies were 62%, while 38% babies had birthweight less than 2500 gm. 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. [22]

Incidence of neonatal jaundice was 60%, 32% and 8% in vaginal delivery, caesarean section, instrumental delivery respectively. 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. [23] Postulated mechanism is that, beta glucuronidases and non-esterified fatty acids in maternal milk, may inhibit normal bilirubin metabolism. [24] Physiological jaundice (32%), prematurity (24%), breast feeding (10%), idiopathic (4%), were most common causes noted in our study. Less common causes noted in our study were ABO incompatibility (6%), sepsis (3%), Rh incompatibility (11%), cephalhematoma (6%), haemolytic anemia (1%), G6PD deficiency (0.50%), and hypothyroidism (4.50%). Yellowish discolouration with good activity (25%), Jaundice with refusal of feeds (30%) were most common symptoms noted. History of delayed cry (18%), fever (15%), and vomiting (12%) symptoms were noted in our study. 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. [25,26]

## 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.

## References


1. Cloherty JP, Eichenwald EC, Stark AR, editors. Manual of neonatal care. Lippincott Williams & Wilkins; 2008.
2. Ramsesh A, Ashok D. AIIMS Protocol Neonatology 2019. 2nd ed. Delhi, India: Noble Vision Medical Books Publishers; 2019.
3. Slusher TM, Zamora TG, Appiah D, Stanke JU, Strand MA, Lee BW, Richardson SB, Keating EM, Siddappa AM, Olusanya BO. Burden of severe neonatal jaundice: a systematic review and meta-analysis. BMJ paediatrics open. 2017;1(1).
4. Olusanya BO, Kaplan M, Hansen TW. Neonatal hyperbilirubinaemia: a global perspective. The Lancet Child & Adolescent Health. 2018 Aug 1;2(8):610-20.
5. Bhutani VK, Zipursky A, Blencowe H, Khanna R, Sgro M, Ebbesen F, Bell J, Mori R, Slusher TM, Fahmy N, Paul VK. Neonatal hyperbilirubinemia and Rhesus disease of the newborn: incidence and impairment estimates for 2010 at regional and global levels. Pediatric research. 2013 Dec;74(1):86-100.
6. Mwaniki MK, Atieno M, Lawn JE, Newton CR. Long-term neurodevelopmental outcomes after intrauterine and neonatal insults: a systematic review. The Lancet. 2012 Feb 4;379 (9814):445-52.
7. Ipek IO, Bozaykut A. Clinically significant neonatal hyperbilirubinemia: an analysis of 646 cases in Istanbul. Journal of tropical pediatrics. 2008 Jan 21;54(3):211-3.
8. 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 Feb 12;10(2):e0117229.
9. Escobar GJ, Greene JD, Hulac P, Kincannon E, Bischoff K, Gardner MN, Armstrong MA, France EK. Rehospitalisation after birth hospitalisation: patterns among infants of all gestations. Archives of Disease in Childhood. 2005 Feb 1;90(2):125-31.
10. Kliegman RM, Stanton BMD, St Geme J, Schor NF, Behrman RE. Nelson Textbook of Pediatrics. 19th Edition. St Louis, MO: Elsevier Saunders. 2011.
11. Mishra S, Agarwal R, Deorari AK, Paul VK. Jaundice in the newborns. Indian J Pediatr. 2008; 75:157-63.
12. 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.
13. 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.
14. 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.
15. 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.
16. Stokowski, Laura A. Fundamentals of phototherapy for neonatal jaundice. Adv Neonat Care. 2011;11.

17. Narang A, Gathwala G, Kumar P. Neonatal jaundice: an analysis of 551 cases. Indian pediatrics. 1997 May 1; 34:429-32.
18. Effiong CE. Neonatal jaundice in Ibadan. Incidence and etiologic factors born in hospital, Nigeria. Journal of National Medical Association 1975;67(3):208-10.
19. Korejo H. Risk factors for kernicterus in neonatal jaundice, Karachi, Pakistan. GJMS. 2010; 8:1.
20. Varvarigou A, Fouzas S, Skylogianni E, Mantagou L, Bougioukou D, Mantagos S. Transcutaneous bilirubin nomogram for prediction of significant neonatal hyperbilirub inemia. Pediatrics. 2009;124(4):1052-9.
21. 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.
22. Stoll BJ, Kliegman RM. Jaundice and hyperbilirubinemia in the newborn. Nelson textbook of pediatrics. 19th ed. Philadelphia: WB Saunders. 2011;562-96.
23. Porter ML, Dennis BL. Hyperbilirubinemia in the term newborn. Am Fam Physician. 2002 ;65(4):599-606.
24. Gartner LM, Herschel M. Jaundice and breastfeeding. Pediatr Clin North Am. 2001; 48:389-99.
25. 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).
26. Shetty A, Kumar BS. A study of neonatal hyperbilirubinemia in a tertiary care hospital. International Journal of Medical Science and Public Health. 2014 Oct 1;3(10):1289-92.