

Knowledge about Neonatal Jaundice among Nepalese Mothers

S Shrestha¹, S Maharjan², S Shrestha³, MA Petrini⁴

¹Karnali Academy of Health Science, Jumla, ²Asian College for Advance Studies, Lalitpur, ³Iwamura College of Health Science, Bhaktapur, ⁴Wuhan University, Hope School of Nursing, China

Abstract:

Background: Worldwide, Neonatal Jaundice is one of the most common disorders and causes of avoidable brain damage and physical and mental impairment, and probable death in newborns. It is an important contributor to the high neonatal morbidity and mortality in Nepal.

Objective: To assess among mothers the knowledge about neonatal jaundice.

Method: A descriptive cross-sectional study was conducted among 177 mothers in selected village with convenient sampling technique.

Results: Findings revealed that around half of the mothers (49.90%) had low level of knowledge (score <50%), 28.60% mothers had moderate level of knowledge (score 50-75%) and only 22% mothers had adequate level of knowledge (score >75%) regarding neonatal jaundice. A large proportion of mothers (84%) believed that danger sign of neonatal jaundice was unable to feed the baby. Few 11% mothers believed that mental retardation and death was the complication of neonatal jaundice. Few mothers (12%) were aware about the cause of neonatal jaundice. Around 74% believed that exposing the baby to the sunlight is the primary management of neonatal jaundice but only 2% heard about the phototherapy.

Conclusion: Knowledge about neonatal jaundice was low among Nepalese mothers. Awareness should be created among the expecting mothers about neonatal jaundice and encourage them to take preventive measures to avert neonatal mortality and morbidity.

Keywords: Knowledge, Neonatal Jaundice

Introduction

Neonatal jaundice (NNJ) is a common condition that pediatricians encounter in their practice. It is still a leading cause of preventable brain damage, physical and mental handicap, and early death among infants in many countries, especially in developing country like Nepal. An estimated 50% of term and 80% of preterm infants develop jaundice, typically 2-4 days after birth.¹ Newborns show clinical signs which tend to start on the head and face and then spread

down the trunk and limbs as a result of high serum levels of bilirubin.

Jaundice in newborns is a result of increased release of haemoglobin from breakdown of red cells due to high haemoglobin at birth, as well as due to reduced lifespan of newborn red blood cells (70-80 days) compared to that of adults (90-120 days) and reduced hepatic metabolism of bilirubin due to immature hepatocytes. Most of this newborn hyperbilirubinemia is a natural transition which resolves by the first week of life with maturing of the liver.² Hyperbilirubinemia is an important cause of morbidity in the neonatal period, especially in

Address for correspondence

Dr. Sharmila Shrestha

Karnali Academy of Health Science, Jumla

Email: sharmila_shr@hotmail.com

the first week of life.³ The maximum risk of hyperbilirubinemia is Kernicterus because of accumulation of unconjugated bilirubin in serum. According to a study, Kernicterus causes at least 10% of mortality and 70% of morbidity. However, correct use of phototherapy and blood exchange to control serum bilirubin level, can prevent complications.² The sign and symptoms of NNJ are lethargy, poor feeding, high pitched cry, hypertonia, seizures, high-frequency hearing loss, cerebral palsy and mental retardation.

The growth and development of some infants are unhealthy because of their mother's lack of knowledge or the use of in-appropriate or potentially harmful traditional child-rearing practices.^{4,5} Mothers need information related to baby care, childhood diseases, immunizations, and infant feeding, during postpartum period.^{6,7} Neonatal jaundice is one of the common responsible reasons for admission of the neonates in the hospital. Neonatal jaundice is a condition which can be cured easily if it is diagnosed on time. But due to lack of knowledge and ignorance of the mother about the neonatal jaundice, the neonates are not getting the treatment on time. As a result, the neonates are facing various types of complication like: mental retardation, deafness, brain damage and many other problems. In Nepal, a study that was conducted at Kanti Bal Hospital which reported that most of the babies with the physiological jaundice 94.5% were cured and 5.5% were death.³ A study conducted in Myanmar reported that neonatal jaundice was the major cause of neonatal morbidity and mortality and was responsible for 46% of hospital admission of neonates in the country.⁸

In 2015, a cross sectional study was conducted in Islamabad among 200 respondents to assess the knowledge of mother regarding neonatal jaundice. The study showed that 52.5% mothers had inadequate score while 47.5% mothers had adequate knowledge score.⁹ A study conducted in Nigeria among 350 mothers found that 34% of the mothers had knowledge about complication of neonatal jaundice that is brain damage (kernicterus), 270 mothers (75.4%) had never heard about the complication of neonatal jaundice. About 58% mothers accepted that exposing the babies to sunlight could prevent the condition. It concluded that knowledge about NNJ was low and utilization of preventive practices was ineffective.¹⁰

Another study conducted in Nigeria showed that about 92.4% mothers were aware of neonatal jaundice, 67% admitted taking their jaundiced babies to hospital, 19.4% followed the traditional medication, and 13.2% mothers neither took their neonates to hospital nor followed any traditional medication. The study revealed that there is existence of the knowledge gap among the mothers of the babies with neonatal jaundice.¹¹ A study conducted by Adebami¹² showed that 217 mothers (63.5%) had appropriate knowledge, 215 mothers (36.5%) had no knowledge about neonatal jaundice. This study also showed that the knowledge of neonatal jaundice was better with increased parity, maternal age and maternal social class and attendance of antenatal care. In 2015, a study was conducted in Lucknow, India among 240 mothers to assess the knowledge of mothers with children aged 0-23 months regarding neonatal jaundice which revealed that the mothers had inadequate knowledge about neonatal jaundice. In this study, about 80%

mothers had heard about neonatal jaundice, about 68.7% mothers responded that fever is the danger sign of NNJ.¹³

In Nepal, most of the mothers are not aware about NNJ due to lack of education and awareness, inexperience, and traditional and cultural beliefs. As a result, the neonates are not getting proper treatment. Hence, this research was conducted among mothers to study about knowledge regarding neonatal jaundice which may help reduce the number of neonate hospitalization and, also, neonatal mortality and morbidity.

Materials and methods

Study Design: A descriptive cross-sectional study was conducted.

Study area /site: The research was conducted at Sunakothi Sub-metropolitan city ward No. 27, Lalitpur.

Sample size and Sampling method: The sample size was determined using the formula, $n = z^2 pq / l^2$ (Cochran, 1997). The prevalence rate of knowledge about neonatal jaundice was 22%.¹⁴ Total 177 mothers were included for data collection. Non-probability purposive sampling technique was adopted. The duration of data collection was two months.

Participants

The mothers who had child less than two years old and both primi and multi parity mothers were included in the study. The mothers who had sick and unstable child and mothers with twin baby were excluded.

Data collection procedures

The data was collected by using structured questionnaire through interview method. The questionnaire was developed by author by an

extensive review of the literature and consulting with subject expertise. Educational midwives again reviewed the draft questionnaire and then the tool was pretested. To ensure face validity, the questionnaire was given to three subject matter experts, who were required to evaluate the items with respect to problems, ambiguity, relativity, proper terms and grammar, and understandability. For content validity, three experts in midwifery were consulted and they were asked to assess the qualitative aspect of content validity. The questionnaire was modified based on their advice. Then, the instrument was pretested in 10 mothers who met the inclusion criteria and were not included in the study. Pretesting was done to assess the clarity of language, time required for completion of interview and feasibility of the interview. At the end, internal consistency of the items was assessed, using Cronbach's alpha method. According to the expert judgments, content validity ratio was 0.81. Besides, the reliability of the questionnaire was confirmed with Cronbach's alpha= 0.78. The demographic information was collected using a simple self-designed questionnaire, including the age, educational status, occupation, ethnicity etc. There were 15 questions with single choice which were related to knowledge of: causes, danger signs, complications and treatment of NNJ. Each item was scored as 1= correct answer (best one) and 0= wrong answer and no answer. The sum of the scores comprises the NNJ knowledge score of the participants. The highest possible score is 15 (100%), and knowledge levels are categorized as low (<50%), moderate (50-75%) and adequate (>75%).

Ethical considerations

Ethics approval was obtained from Institutional Review Board of Asian College for Advance Studies affiliated by Paranchal University and study venue. The purpose of research was explained to each respondent and written informed consent was obtained. Participants were informed that they were free to withdraw any time without reason and promised that the data would be kept private and confidential.

Data analysis

The data obtained was entered into a computer and descriptive analysis was done using statistical analysis software SPSS version 17.

Results

Table 1 represents the demographical characteristic of the respondents. Majority of the respondents (57%) were at the age of 25-30 years and least of the respondents (5%) were below 20 years. More than half (51%) mothers had the education above class 10 and least of the respondents (7%) were illiterate. Majority (82%) followed the Hindu religion; around 69% mothers were from Janajati. About 43% mothers were housewives and only 5% mothers had agriculture as an occupation. Almost all the mothers (99%) had attained antenatal visit during their pregnancy and only 1% had not and more than half of the mothers (55%) were primiparous.

Table 1: Demographic characteristic (N=177)

Categories	n	%
Age ranges (years)		
≤ 20	9	5
21- 25	32	18
25- 30	101	57
31- 35	35	20
Religion		
Hindu	145	82
Muslim	5	3
Buddhist	18	10
Christian	9	5
Occupation		
House maker	76	43
Job	74	42
Student	18	10
Agriculture	9	5
Caste		
Janajati	121	69
Chhetri	35	20
Brahmin	14	8
Dalit	7	4
Education		
Illiterate	5	7
Primary (1- 5Class)	9	12
Secondary (5- 10 class)	24	31
college (above 10 class)	39	51
ANC visit		
Yes	175	99
No	2	1
Parous		
Primiparous	97	55
Multiparous	80	45

In the study, only 22% mothers had adequate, 49% mothers had moderate and 29% mothers has low level of knowledge regarding NNJ (Table 2).

Table 2: Level of Knowledge about NNJ among respondents (N= 177)

Level of knowledge about NNJ	(N= 177)	
	n	%
low (<50%)	51	29%
Moderate (50- 75%)	87	49%
Adequate (>75%)	39	22%

Table 3 shows the results of the assessment of maternal knowledge regarding NNJ. Among the 177 respondents, 154 (87%) respondents correctly identified jaundice as yellowish discoloration of the eyes. Few respondents, 9 (5%) responded that jaundice is the infection of skin. Almost all respondents 172 (97%) knew NNJ is common in newborn. Around half of respondents knew that physiological jaundice occurs in 2-3 days in newborn baby while 26% didn't know about it. Around two thirds 131 (74%) respondents could not identify any cause of jaundice. One hundred and forty (79%) mothers identified that jaundice was first noticed in eyes. Most 135 (76%) of the respondents believed that treatment is mainly by exposing in sunlight, while only 1% respondents knew that the correct form of treatment of NNJ was phototherapy. Regarding the danger signs, 84% mothers answered refusal to eat, 70% high pitched cry, 46% fever and 43% didn't know about it. About the effect of NNJ, only 10% respondents correctly identified about brain damage. About the maternal knowledge about primary management of NNJ, most of the respondents answered that they need to avoid keeping oil to the baby and to expose the baby in sunlight at early morning as early management of NNJ. Almost all the mothers (95%) had knowledge about the need of exclusive breastfeeding during NNJ.

Approximately two-thirds of the respondents (78%) had knowledge about traditional/ cultural belief of giving herbal medicine in NNJ. A majority 138 (78%) of the respondents were willing to have treatment in hospital.

Table 3: Knowledge of Participants about NNJ (N= 177)

Categories	n	%
Definition of NNJ		
Yellowness of the eyes	154	87
Redness of the eyes	14	8
Infection of the skin	9	5
Common problem in newborn		
Yes	172	97
No	5	3
Foods taken by mothers can cause jaundice in neonates		
Yes	154	87
No	23	13
Visibility of physiological jaundice in neonates		
2- 3 days	83	47
don't know	46	26
7- 8 days	35	20
5- 6 days	14	8
Causes of NNJ		
Don't know	131	74
Infection	21	12
Blood incompatibility	17	10
Prematurity	8	5
Part of the body where jaundice is first noticed		
Eyes	140	79
Face	14	8
All over the body	12	7
Hands and feet	12	7
Treatment of NNJ		
Herbal medications	135	76
Consult the Doctor	25	14
Phototherapy	16	9
Exchange transfusion	2	1
Danger signs of NNJ		
Refusal of feeds	149	84
High-pitched cry	124	70
Fever	81	46
Don't know	76	43
Effects of NNJ		
Liver damage	140	79
Brain damage	18	10
Mental Retardation	16	9
Death	3	2
Early management of NNJ		
Avoid keeping oil to the baby.	168	95
Exposing in sunlight early in morning.	154	87
Taking the baby to hospital.	21	12
don't know	5	3
Knowledge about primary management of NNJ		
Put baby in the sun	131	74
Put baby in the sun	21	12
Give herbs	12	7

Hospital treatment	9	5
Give sugar water	5	3
None		
Knowledge about Traditional/ cultural practice about NNJ *		
Exposure to sunlight	154	87
Herbal medicine	138	78
Restrict oil message	115	65
Nothing	71	40
Knowledge about breastfeeding during NNJ		
Exclusively breastfed	168	95
Breast and formula	2	1
Breast milk and sugar water	7	4
Food Restrictions followed by the mother		
Avoiding food containing turmeric	53	30
Have only milk and rice	46	26
Avoiding meat and meat products	41	23
No need any restriction	37	21
Willingness to take baby to hospital		
Yes	138	78
No	39	22

Discussion

This study explored the level of knowledge among mothers about NNJ. To reduce the neonatal morbidity and mortality, the acquisition of knowledge, positive attitude and effective management by mothers is viewed as key strategies. Adequate maternal knowledge, early perception and care seeking behavior are fundamental components of effective management of NNJ.¹⁴ In this study, only 22% mothers had adequate level of knowledge about NNJ whereas a study conducted in Egypt shows that 52.3% of participants had adequate knowledge about NNJ.¹⁵ The majority (87%) of respondents knew that NNJ was yellowness of the eyes and 79% of the mothers correctly indicated the eyes as the part of the body where jaundice is first noticed. This finding supported previous studies.^{10,16-18} The knowledge of the causes of NNJ was low as 74% of the respondents did not know any cause and 15% had reported wrong causes, such as: blood

incompatibility and prematurity. This finding was similar to other findings in Iran and Nigeria.^{10,16-18} In this study, around half (47%) mothers knew that neonatal jaundice was visible after two to three days of the delivery. Regarding the knowledge of danger signs, 84% of respondents answered that the newborn refusing to feed was a danger sign. Around half (43%) of the respondents answered that they did not know any. This finding was similar to other finding in Nigeria.¹⁰ A large population of mothers (79%) had a low knowledge about the effect of jaundice. But this finding was opposite in a study conducted in Malaysia which found that 70% of mothers knew that jaundice could cause death and brain damage.¹⁹ In our study, only 9% of respondents were aware of phototherapy as a standard treatment for neonatal jaundice. The study conducted in Sri-Lanka found that 44% of respondents were aware of phototherapy as a standard treatment for NNJ because in this study, majority of them (54%) were mothers who were working in the health sector as a nurse and midwifery.²⁰ Regarding willingness to take baby to the hospital if their babies developed NNJ, majority (78%) of respondents were willing. A study conducted by Goodman¹⁰ shows that majority (90.4%) of respondents had willingness to take the baby to hospital. Majority of respondents (74%) had knowledge about exposing the newborns to sunlight as a primary treatment practice for NNJ. In sub-Saharan Africa also, exposure of newborn with jaundice to sunlight was a common practice.^{21,22} The traditional practice about NNJ in Nepal was to expose the newborn in sunlight (87%) and used herbal medicine (78%) which was similar to the study in Vietnam.²³ About 30% mothers avoid food

containing turmeric while their baby had jaundice. Maternal education is an important factor influencing newborn health and illness. Education helps to prepare mothers to cope with new situations while caring the infants.²⁴

Limitations and future research

There were some limitations in this study. This study was conducted in a small community within a short duration of data collection. Therefore, a replication of the study should be conducted in different communities and different geographic areas with large population of postnatal mothers. The small sample size in our study limits our ability to draw conclusions about the level of maternal knowledge on NNJ among mothers in Nepal. The questionnaire was a newly-developed one in this study, so, needs to be used in various studies in different countries, especially in developing countries. Future studies should be conducted with a larger sample size including different health centers and communities, and long-term follow-up care should be arranged.

Conclusion

This study shows that only 22% of the respondents had adequate knowledge regarding NNJ. The respondents' knowledge of causes, danger signs, complications, treatment, primary management of NNJ was low. Neonatal care has always been neglected in our country as yet Nepalese people are not properly educated. Although almost all the mothers had ANC visit, they didn't have enough knowledge about the neonatal jaundice; thus, need more attention in antenatal care clinics. Awareness should be created among the expecting mothers about neonatal jaundice and encourage them to take

preventive measures to avert neonatal mortality and morbidity.

Acknowledgement

We would like to thank all the women who volunteered for this research.

References

1. Woodgate P, Jardine LA. Neonatal jaundice: phototherapy. *BMJ clinical evidence*. 2015;1-21.
2. Stoll BJ, Kliegman RM. Jaundice and hyperbilirubinemia in the newborn, *Nelson textbook of Pediatrics*. 19th edition, 2012. pp 603-18.
3. Nepal D, Bastola D, Dhakal AK, Mishra U, Mahaseth C. Neonatal Hyperbilirubinemia and its outcome. *Journal of Institute of Medicine*. 2009; 31(3):17-20.
4. Senarath U, Fernando DN, Vimpani G, Rodrigo I. Factors associated with maternal knowledge of newborn care among hospital-delivered mothers in Sri Lanka. *Transactions of the Royal society of tropical medicine and hygiene*. 2007 Aug 1; 101(8): 823-30.
5. Newbrander W, Natiq K, Shahim S, Hamid N, Skena NB. Barriers to appropriate care for mothers and infants during the perinatal period in rural Afghanistan: a qualitative assessment. *Global Public Health*. 2014 Jul 21; 9(sup1): S93-109.
6. Gupta P, Srivastava VK, Kumar V, Jain S, Masood J, Ahmad N, Srivastava JP. Newborn care practices in urban slums of Lucknow city, UP. *Indian journal of community medicine*. 2010 Jan; 35(1): 82.
7. Shrestha S, Adachi K, Petrini MA, Shrestha S. Factors associated with post-natal anxiety among primiparous mothers in Nepal.

-
- International nursing review. 2014 Sep; 61(3): 427-34.
8. Arnolda G, Nwe HM, Trevisanuto D, Thin AA, Thein AA, Defechereux T, Kumara D, Moccia L. Risk factors for acute bilirubin encephalopathy on admission to two Myanmar national paediatric hospitals. *Maternal health, neonatology and perinatology*. 2015 Dec; 1(1): 22.
 9. Yaqub A, Safdar F, Ghani Z. To assess the knowledge of mothers regarding neonatal jaundice presenting to Rawal Institute of Health Sciences Islamabad. *Isra Medical Journal*. 2016; 8(1): 28-31.
 10. Goodman OO, Kehinde OA, Odugbemi BA, Femi-Adebayo TT, Odusanya OO. Neonatal jaundice: knowledge, attitude and practices of mothers in Mosan-Okunola community, Lagos, Nigeria. *Nigerian Postgraduate Medical Journal*. 2015 Jul 1; 22(3): 158.
 11. Onyearugha CN, Chapp-Jumbo A, George IO. Neonatal jaundice: evaluating the knowledge and practice of expectant mothers in Aba, Nigeria. *Journal of Health Science Research*. 2016 Sep 6; 1(2): 42-7.
 12. Adebami OJ. Appraisal of maternal knowledge of neonatal jaundice in Ilesa, South-western Nigeria: What implications for persistence of acute bilirubin encephalopathy in developing countries. *Basic Res J Med Clin Sc*. 2015 Jun; 4(6): 156-6.
 13. Shukla M, Agarwal M. Knowledge of mothers regarding neonatal jaundice attending immunization clinic at a tertiary care hospital of Lucknow. *Int J Appl Res*. 2016; 2: 297-9.
 14. Ezeaka CV, Ugwu RO, Mukhtar-Yola M, Ekure EN, Olusanya BO. Pattern and predictors of maternal care-seeking practices for severe neonatal jaundice in Nigeria: a multi-centre survey. *BMC health services research*. 2014 Dec; 14(1): 192.
 15. Moawad EM, Abdallah EA, Ali YZ. Perceptions, practices, and traditional beliefs related to neonatal jaundice among Egyptian mothers: A cross-sectional descriptive study. *Medicine*. 2016 Sep; 95(36): e4804.
 16. Khalesi N, Rakhshani F. Knowledge, attitude and behaviour of mothers on neonatal jaundice. *The Journal of the Pakistan Medical Association*. 2008 Dec; 58(12): 671.
 17. Amirshaghghi A, Ghabili K, Shoja MM, Kooshavar H. Neonatal jaundice: knowledge and practice of Iranian mothers with icteric newborns. *Pak J Biol Sci*. 2008 Mar 15; 11(6): 942-45.
 18. Egube BA, Ofili AN, Isara AR, Onakewhor JU. Neonatal jaundice and its management: knowledge, attitude, and practice among expectant mothers attending antenatal clinic at University of Benin Teaching Hospital, Benin City, Nigeria. *Nigerian journal of clinical practice*. 2013; 16(2): 188-94.
 19. Boo NY, Gan CY, Gian YW, Lim KS, Lim MW, Krishna-Kumar H. Malaysian mothers' knowledge & practices on care of neonatal jaundice. *Med J Malaysia*. 2011 Aug; 66(3): 239-43.
 20. Rodrigo BK, Cooray G. The knowledge, attitude & behaviour on neonatal jaundice of postnatal mothers in Provincial General Hospital, Badulla. *Sri Lanka Journal of Child Health*. 2011;40: 164-8.
 21. Ogunlesi TA, Abdul AR. Maternal knowledge and care seeking behaviors for
-

- newborn jaundice in Sagamu, Southwest Nigeria. *Nigerian Journal of clinical practice*. 2015; 18(1): 33-40.
22. Onyearugha CN, Chapp-Jumbo A, George IO. Neonatal jaundice: evaluating the knowledge and practice of expectant mothers in Aba, Nigeria. *Journal of Health Science Research*. 2016 Sep 6; 1(2): 42-7.
23. Le LT, Partridge JC, Tran BH, Le VT, Duong TK, Nguyen HT, Newman TB. Care practices and traditional beliefs related to neonatal jaundice in northern Vietnam: a population-based, cross-sectional descriptive study. *BMC pediatrics*. 2014 Dec; 14(1): 264.
24. Shrestha S, Adachi K, Petrini MA, Shrestha S, Khagi BR. Development and evaluation of a newborn care education programme in primiparous mothers in Nepal. *Midwifery*. 2016 Nov 1; 42: 21-8.