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Neonatal Jaundice: Knowledge and Practice of Iranian Mothers with Icteric Newborns

¹Abdolahad Amirshaghghi, ²Kamyar Ghabili, ²Mohammadali M. Shoja and ³Hossein Kooshavar

¹Department of Pediatrics, Children's Hospital, Tabriz University of Medical Sciences, Tabriz, Iran

²Tuberculosis and Lung Disease Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

³Faculty of Health and Nutrition, Tabriz University of Medical Sciences, Tabriz, Iran

Abstract: The present study was conducted on a group of Iranian mothers with icteric newborn in order to identify any wrong knowledge and improper practices related to the neonatal jaundice. Such an estimate of knowledge and practices of mothers may be required for implementing the educational programs on which the preventive measures of kernicterus are principally thought to be depended. Between June 2004 and February 2007, 1666 mothers with icteric newborn hospitalized at a single center were enrolled. A questionnaire was used to assess the participants' knowledge and practice of neonatal jaundice. A knowledge score was calculated based on the responses. The mean knowledge score was 3.38 ± 1.23 (out of 6). About 77% of the mothers had moderate-to-high level of knowledge of neonatal jaundice. Approximately one-third of the mothers consulted a physician within 24 h of appearance of jaundice and 13.8% declared that they waited and managed their children with traditional remedies until they sought medical advices. Furthermore, 32.2% of the mothers discontinued feeding their icteric offspring with colored foods and colostrums. Hence, 42.8% of the mothers acted weakly with regard to their icteric offspring. The health care workers were the participants' major source of information about neonatal jaundice. The present study determined a fairly adequate knowledge of Iranian mothers about the neonatal jaundice with incomparable level of related practices. The findings of this study should be considered seriously by the local health centers and the medical professionals to provide consistent information about jaundice and its causes for the parents.

Key words: Neonatal jaundice, knowledge, hyperbilirubinemia, kernicterus

INTRODUCTION

Neonatal jaundice is the most common condition for which the newborns are hospitalized. This also substantially contributes to the neonatal morbidity and mortality in developing countries (Willis *et al.*, 2002; Ogunfowora and Daniel, 2006). During the first week of life, nearly 1 to 4% of full-term infants are admitted to the hospital for neonatal jaundice (Madlon-Kay, 2002). If left untreated, neonatal jaundice may lead to encephalopathy (kernicterus) resulting in a neurological handicap and early death of the affected infants (Ogunfowora and Daniel, 2006). The short post-delivery hospital stays, delays in obtaining a post-discharge appointment, increased frequency of breastfeeding, lack of concern about high bilirubin levels among both the parents and pediatric care providers and failure to treat hyperbilirubinemia at the recommended levels are considered as factors associated with the occurrence of kernicterus (Ogunfowora and Daniel, 2006; Suresh and Clark, 2004; Harris *et al.*, 2001). Detection of infants at risk

for developing significant hyperbilirubinemia and early treatment are of utmost importance in decreasing the likelihood of kernicterus (Petrova *et al.*, 2006).

Numerous strategies have been proposed to reduce the development of kernicterus in icterus infants. However, many of these are thought to significantly increase health care costs without certain benefits (Suresh and Clark, 2004). One of the strategies, probably not leading to increased costs, is to provide parents with adequate educational materials including the information about neonatal jaundice (Madlon-Kay, 2002; Suresh and Clark, 2004). In other words, it seems that any action taken by mothers is partially influenced by their knowledge of neonatal jaundice. In order to implement educational programs in this context, it is essential to have an estimate of mothers' knowledge and practices toward neonatal jaundice. To the best of our knowledge, no survey has hitherto been performed worldwide to assess mothers' level of knowledge about neonatal jaundice and their practices. Therefore, the present study was designed and performed on a group of Iranian mothers with icteric

newborn to identify any wrong knowledge and improper practices related to the neonatal jaundice. This would potentially assist the health care providers to implement goal-directed educational programs.

MATERIALS AND METHODS

Between June 2004 and February 2007, 1666 mothers whose newborns were hospitalized at a single center (Children's Hospital, Tabriz University of Medical Sciences) due to the neonatal jaundice (total bilirubin >12 mg dL⁻¹) were enrolled in this study. Exclusion criteria were those with newborns diagnosed with sepsis, pneumonia, hypoxemia or other secondary causes of jaundice.

Mothers were consulted by the interview team and were verbally informed about the aims of the study. A pre-designed questionnaire including several items on mothers' knowledge of neonatal jaundice and practices was used. The questionnaires were filled by trained interviewers speaking both the Persian and Turkish languages. The questionnaire consisted of four sections; (1) demographic items consisting of both maternal (4 items) and neonatal (7 items) subsections, (2) questions covering the general information concerning jaundice and its causes (6 items), (3) questions related to the mothers' practices toward their icteric newborns (4 items) and (4) a question about the source of mothers' information (1 item).

Initially, the questionnaire was pre-tested on a group of 150 mothers in order to increase the clarity of the questions and to calculate the required sample size with an error of estimation of 0.03 and a 95% confidence interval. Thus, the sample size of 1666 mothers was obtained. The pre-tested mothers were excluded from the final study population.

The total correct answers to the 6-item knowledge section were summed up and mothers' knowledge was classified into low (0-2 correct responses), moderate (3-4 correct responses) and high (5-6 correct responses) levels. Further examinations were made by the pediatricians in order to determine the signs of kernicterus (poor sucking reflex, hypotonia, impaired consciousness and poor neonatal reflexes) at the time of discharge from the hospital. In this study, SPSS for Windows version 12.0 was used for coding and data analysis. Data were presented in mean±Standard Deviation (SD).

RESULTS

Approximately, 8% of mothers were illiterate and 12% had university-level education. Thirteen percent of mothers declared that they previously had an icteric newborn of which 1.4% had persistent complications (Table 1).

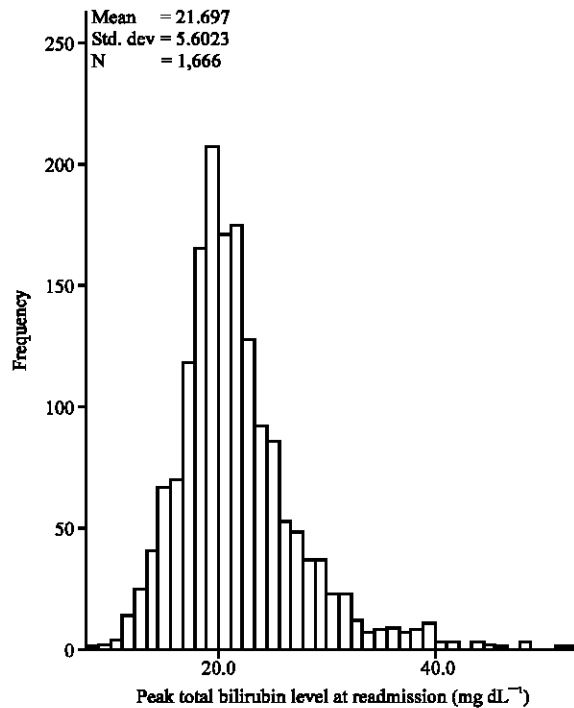


Fig. 1: Neonates' peak total bilirubin level at readmission

Table 1: Mothers' demographic characteristics (n = 1666)

Characteristic	No. (%)
Place of residence	
City	1114 (68.4)
Town	235 (14.4)
Rural area	280 (17.2)
Educational level	
University	196 (12)
High school	555 (34)
Guidance school	285 (17.5)
Primary school	460 (28.2)
Illiterate	135 (8.3)
Previous sibling with jaundice	
Yes	220 (13.5)
No	1409 (86.5)
Previous sibling with complications due to the neonatal jaundice	
Yes	23 (1.4)
No	1605 (98.6)

Fifty seven percent (n = 937) of the infants were male and 43% (n = 729) were female. The mean peak serum bilirubin level reported at the readmission was 21.6±5.6 mg dL⁻¹ (range 8-53 mg dL⁻¹) (Fig. 1). Subsequent to the treatment, a virtually two-fold decline in the mean peak bilirubin level was noticed (10.1±1.7 mg dL⁻¹, range 2-23 mg dL⁻¹) (Fig. 2). In addition, the mean time at which the jaundice appeared was 3.5±1.9 day of birth. The features of the neonates are presented in Table 2.

The mean knowledge score was calculated 3.38±1.23. About 77% of mothers had moderate-to-high level of knowledge about neonatal jaundice. A list of knowledge

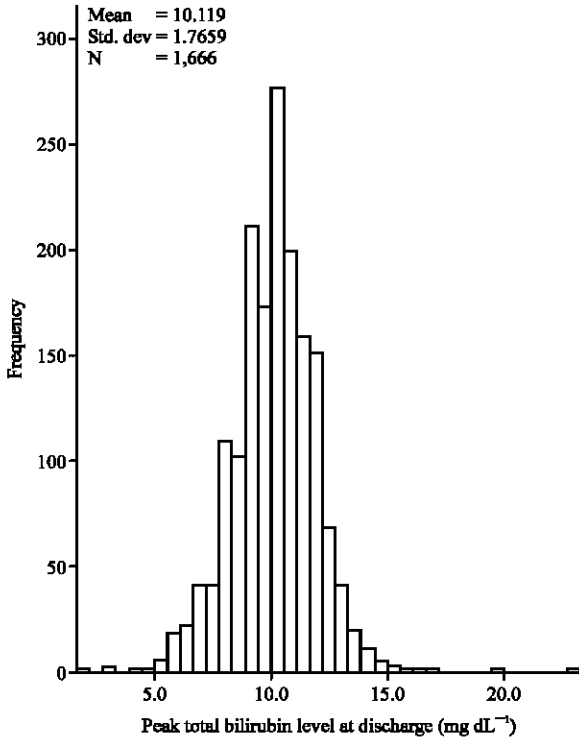


Fig. 2: Neonates' peak total bilirubin level at discharge

Table 2: Neonates' demographic characteristics (n = 1666)

Characteristic	Mean±SD*
Sex, male, No. (%)	937 (57.1)
Birth weight (g)	3043.7±558.1
Weight at readmission (g)	3080.1±567.9
Age at readmission (day)	6.84±3.9
Onset of icterus (day)	3.5±1.9

SD: Standard deviation. *Unless stated otherwise

Table 3: The knowledge questions and respondents' correct answers (n = 1666)

Questions	Correct answer (%)
Is it necessary to consult a physician immediately after the newborn's yellow skin is noticed?	1597 (95.9)
Is there a relation between neonatal icterus and blood groups?	489 (29.4)
Is neonatal jaundice a serious and alarming condition?	1215 (72.9)
Is there a relation between neonatal icterus and consumption of the colored foods?	528 (31.7)
Is neonatal icterus associated with feeding the newborn with colostrums?	593 (35.6)
Is jaundice harmless to the infant?	1204 (72.3)

questions and the percentage of mothers' correct responses are provided in Table 3.

Approximately one-third of the mothers consulted a physician within 24 h of the appearance of jaundice and 13.8% declared that they waited and managed their children with traditional remedies until they sought medical advices. Furthermore, 27.5 and 4.7% of the mothers discontinued feeding their icteric offspring with

colored foods and colostrums, respectively. Hence, 42.8% of mothers acted weakly toward their icteric offspring and postponed the medical consultation.

The majority of the respondents indicated that the health care providers (pediatrician and hospital staff) were the major sources of their information about the neonatal jaundice (58.4%) followed by mass media and relevant books and magazines. About 95% of mothers declared that no jaundice related information was given by the gynecologist in the course of gestational period.

DISCUSSION

The present study observed a fairly adequate knowledge of the participants about the neonatal jaundice. However, their practices toward their icteric newborns were generally not satisfactory, being not comparable to their knowledge level. In our study, approximately one-third of mothers thought that the neonatal jaundice may be associated with feeding the newborn with colostrum milk. Hannon and colleagues have reported a 55% of Spanish and English-speaking respondents who had attributed the breastfeeding to the neonatal jaundice (Hannon *et al.*, 2001). In the present survey, surprisingly, the respondents' incomplete information on the causes of neonatal icterus did not essentially lead their newborns to be deprived of colored foods and colostrum.

About 40% of mothers in this study initially postponed the medical consultation and employed traditional approaches. In comparison, few participants in the studies from Turkey (Aladag *et al.*, 2006) and Nigeria (Ogunfowora and Daniel, 2006) indicated the traditional remedies as an alternative treatment for the neonatal jaundice. Since no empirical data has justified the role of traditional remedies, which are mainly based on the wrongly-held traditional beliefs, phototherapy and exchange transfusion have remained the standard treatment of neonatal hyperbilirubinemia (Ogunfowora and Daniel, 2006; Schwoebel and Gennaro, 2006).

Although health care staff was the main source of information in more than half of the respondents' questionnaires in this study, there is a need to reinforce the knowledge of community health workers about the neonatal jaundice and its complications. The findings of this study should be considered seriously by the local health centers and the medical professionals to provide consistent information about the neonatal jaundice and its causes such as breastfeeding for the parents. This may maintain a successful breastfeeding as an important part of mother-child relationship. In the present study, experienced qualified interviewers, careful structuring of

interview checklists and comprehensively calculated sample size of the study minimized the potential for bias. Taken altogether, the authors believe that the data generated important issues for the future educational programs. Furthermore, the authors recommended that the similar researches on mothers' level of knowledge and their practices toward icteric newborns be installed throughout the region in order to get more accurate and comprehensive findings for designing the related educational programs.

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