

Malaysian Mothers' Knowledge & Practices on Care of Neonatal Jaundice

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SUMMARY

This study aimed to determine the gaps of knowledge and practices of care of neonatal jaundice among Malaysian mothers. It was a cross sectional study of 400 mothers who attended the obstetric clinics or were admitted to the obstetric wards of a general hospital. They were surveyed with a structured set of questionnaire. The results showed that a majority (93.8%) of them knew about neonatal jaundice, and 71.7% knew that jaundice lasting more than 2 weeks was abnormal. However, only 34.3% of them were aware that jaundice appearing during the first 36 hours of life was abnormal. Less than 20% knew about glucose-6-phosphate dehydrogenase deficiency and that fetal-maternal blood group differences could cause jaundice. Although 71.7% and 69.7%, respectively, of the mothers knew that severe jaundice could cause death and brain damage, only 38.4% of them were aware that severe jaundice could result in hearing impairment. A very low proportion (27.1%) of them was aware that putting jaundiced infants under the direct sun could result in dehydration and worsening of jaundice. Out of a maximum score of 15, the mean maternal knowledge score was 7.4 (95% confidence intervals: 7.1, 7.7). Majority (83.1%) of the multiparous mothers with a past history of having children developing neonatal jaundice (n=154) practiced placing their infants under the direct sun. This study revealed that there was a wide knowledge gap among Malaysian mothers on care of neonatal jaundice. Placing infants under the direct sun was still a common practice.

KEY WORDS:

Maternal knowledge, Neonatal jaundice, Sunning

INTRODUCTION

Neonatal jaundice is a condition characterized by the yellow discoloration of the skin and sclera of newborn infants. It is caused most commonly by the accumulation of unconjugated serum bilirubin. Unconjugated hyperbilirubinemia usually reflects a normal transitional phenomenon in most infants. However, when serum bilirubin levels rise excessively, it is a cause for concern because unconjugated bilirubin is neurotoxic and can cause death in newborns and lifelong neurologic sequelae (kernicterus), including cerebral palsy and hearing loss, in the survivors¹⁻⁴. For these reasons, infants who develop jaundice need close monitoring and severe neonatal jaundice requires immediate medical attention. Hence, some knowledge about

the risks, complications, early detection of neonatal jaundice and its management by mothers is important.

A search via the Pubmed using the term neonatal jaundice yielded a total of 2358 articles/journals published between the years 1985-2007. Of these reports, only nine were surveys of parental knowledge of neonatal jaundice. Five of them were written in foreign language and only four were in the English language⁵⁻⁸.

Neonatal jaundice is a very common problem in Malaysia. Various Malaysian healthcare facilities, including the Malaysian Ministry of Health and private hospitals, have produced educational pamphlets on neonatal jaundice. However, they are not widely and systematically distributed to the public. No studies have been reported previously on how well Malaysian mothers were informed about neonatal jaundice. Neither was there any studies reported on parental knowledge and practices in dealing with neonatal jaundice in Malaysia. The objectives of the present study were to determine the gaps of knowledge and practices about neonatal jaundice in Malaysian mothers.

MATERIALS AND METHODS

This was a cross-sectional study carried out in the Tuanku Jaafar Hospital. The Institutional Scientific and Ethics Committees approved the study protocol.

Universal sampling was carried out on pregnant or postpartum mothers of three major races of Malaysia (Malays, Chinese, and Indians) who attended the obstetric clinics or were admitted to the obstetric wards in the Hospital Tuanku Jaafar from 1 March 2008 to 31 July 2008, on days when the investigators were available to conduct the interviews. Written informed consent was obtained from all participants before conducting the survey. The method of collecting data from the respondents was via a self-administered questionnaire, with assistance from the investigators whenever requested by the interviewees. The questionnaire consisted of 31 structured questions with set-responses and was divided into three main sections assessing maternal knowledge, practices and sources of education about neonatal jaundice. To facilitate the participants in understanding the questions, the questionnaires were prepared in 3 different languages – English, Malay and Chinese languages. For Indian participants who were not able to understand English, Malay or Chinese, a Tamil translator was used. All

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information given by the participants were kept confidential and they were used solely for the purpose of this study. Prior to the commencement of the study, the questionnaires in the three languages were tested on a small group of mothers of the three ethnic groups to ensure comprehensibility of the questions.

Statistical analysis

The Statistical Package for Social Sciences (SPSS) version 11.5 (Chicago, IL, USA) was used for statistical analysis. The Chi square test was used for analysis of categorical variables, and the Student t test or one-way analysis of variance (ANOVA) for analysis of continuous variables with normal distribution. The maternal knowledge score was computed by assigning a score of "1" for correct answer and a score of "0" for either "not sure" or wrong answers for all each of the questions related to maternal knowledge on neonatal jaundice. The maximum score for maternal knowledge was 15. The association between maternal knowledge scores and the respondents' socio-demographic characteristics was analyzed using either independent sample t test (2 tailed) for linear variables with two categories, or ANOVA for variables with more than two categories. Scheffe test was used for post hoc analysis of ANOVA. P values of less than 0.05 were considered statistically significant.

RESULTS

During the study period, 400 women were recruited, consisting of 200 Malays, 100 Chinese and 100 Indians. Their mean age was 29.5 (SD=5.7) years. Their mean duration of education was 11 (SD=2.7) years. Majority (47.7% or n=191) of them were housewives, 23 (5.8%) were professionals, 81 (20.3%) were skilled workers, 100 (25.0%) were semi-skilled workers, and 5 (1.3%) were of unknown occupation. Majority (n=171 or 42.8%) of them had two to five children, 100 (25.0%) had one child, 11 (2.8%) had six or more children, and the remaining 118 (29.5%) had no children.

There was no significant difference in the mean age of mothers among the three ethnic groups (Table I). ANOVA showed that there was significant difference in the duration of education among the three ethnic groups (p<0.0001). Post hoc tests showed that there was no significant difference in the duration of education between the Malays and the

Chinese (p=0.1), and between the Chinese and the Indians (p=0.2). However, when compared with the Malay mothers, the Indian mothers received significantly shorter duration of education (p<0.0001). There was no significant difference in the number of children among mothers of the three ethnic groups. Neither was there any significant difference in the proportions of mothers engaged in different categories of occupation among the three ethnic groups (p=0.2)

Majority (93.8%) of the mothers knew about neonatal jaundice (Table II), and more than 70% knew that neonatal jaundice was a common neonatal problem, and jaundice lasting more than 2 weeks was abnormal. Less than 50% of the mothers were aware that jaundice appearing during the first 36 hours of life was abnormal, that preterm infants had higher risk of developing jaundice, and that infection in the newborn and certain food taken by the breast feeding mothers could cause jaundice. Twenty percent or less of them knew that breast feeding could cause jaundice, were aware of the condition called glucose-6-phosphate dehydrogenase (G6PD) deficiency and that fetal-maternal blood group differences could cause jaundice. Regarding the sequelae of jaundice, 71.7% and 69.7%, respectively, of the mothers knew that severe jaundice could cause death and brain damage, but only 38.4% of them were aware that severe jaundice could result in hearing impairment. Majority (88.7%) of them knew that jaundiced infants needed blood tests to monitor the severity of jaundice. However, only 27.1% of them were aware that putting jaundiced infants under the sun could result in dehydration and worsening of jaundice (Table II).

Out of a maximum score of 15, the mean maternal knowledge score on neonatal jaundice was 7.4 (95% confidence intervals (CI): 7.1, 7.7). The Malays had significantly higher knowledge scores (mean score: 8.0, 95% CI: 7.6, 8.4) than the Chinese (mean score 6.8, 95% CI: 6.2, 7.3) (p=0.002) and the Indians (mean score: 7.0, 95% CI: 6.4, 7.6) (p=0.01). There was, however, no significant difference in the knowledge scores between the Chinese and Indians (p=0.9). The maternal knowledge scores were significantly higher among mothers who already had other children (mean scores: 7.7, 95% CI: 7.4, 8.0) than nulliparous mothers (mean scores: 6.8, 95% CI: 6.2, 7.3) (p= 0.004). For mothers who already had children, those with a past history of children developing neonatal jaundice scored higher (mean score: 8.0, 95% CI: 7.6, 8.4)

Table I: Demographic data of mothers according to ethnic distribution

Demographic data	Malays n=200	Chinese n=100	Indians n=100	P values
Age in years				
Mean (SD)	30.1 (5.7)	29.4 (5.7)	28.6 (5.7)	0.1
Years of education, mean (SD)	11.6 (2.5)	10.8 (2.9)	10.1 (2.5)	<0.0001
Number of children (%)				
No children	56 (28.0)	24 (24.0)	38 (38.0)	0.05
One child	55(27.5)	25 (25.0)	20 (20.0)	
2-5 children	80 (40.0)	51 (51.0)	40 (40.0)	
> 5 children	9 (4.5)	0	2 (2.0)	
Occupation (%)				
Housewife	88 (44.0)	42 (42.0)	60 (60.0)	0.2
Professionals	13 (6.5)	5 (5.0)	5 (5.0)	
Skilled workers	45 (22.5)	21 (21.0)	15 (15.0)	
Semi-skilled workers	52 (26.0)	29 (29.0)	19 (19.0)	
Unknown	1 (0.5)	3 (3.0)	1 (1.0)	

Table II: Knowledge of neonatal jaundice among mothers of the three ethnic groups

Knowledge on neonatal jaundice	Total no. of infants n=400 (%)	Malay n=200 (%)	Chinese n=100 (%)	Indians n=100 (%)
Aware of a condition in newborn, which is characterized by yellow discoloration of skin	375 (93.8)	197 (98.5)	91 (91.0)	87 (87.0)
Jaundice in newborn is a common problem	284 (71.4)	162 (81.8)	63 (63.0)	59 (59.0)
Jaundice lasting more than 2 weeks is abnormal	286 (71.7)	160 (80.0)	68 (68.7)	58 (58.0)
Jaundice appearing during first 36 hours is abnormal	137 (34.3)	76 (38.2)	33 (33.0)	28 (28.0)
Breast-feeding can cause jaundice	50 (12.6)	16 (8.1)	12 (12.0)	22 (22.2)
Premature infants have higher risk of jaundice	169 (42.7)	105 (53.3)	30 (30.0)	34 (34.3)
Know about G6PD deficiency	74 (19.5)	47 (25.3)	16 (16.3)	11 (11.5)
Infants have higher risk of jaundice if mother and baby's blood groups are different	79 (20.2)	45 (23.0)	12 (12.0)	22 (22.0)
Infection will cause jaundice	158 (40.0)	83 (42.1)	34 (34.1)	41 (41.0)
Certain food taken by breast-feeding mothers can cause jaundice in their infants	170 (43.1)	85 (43.6)	43 (43.0)	42 (42.0)
Severe jaundice can cause death in a newborn infants	286 (71.7)	155 (77.9)	65 (65.0)	66 (66.0)
Severe jaundice can cause brain damage	278 (69.7)	152 (76.4)	59 (59.0)	67 (67.0)
Severe jaundice can damage hearing	153 (38.4)	82 (41.2)	34 (34.0)	37 (37.4)
Jaundice infants needs to have their blood level monitored by medical personnel	354 (88.7)	183 (92.0)	86 (86.0)	85 (85.0)
Sunning a jaundiced infants will increase its risk of dehydration and worsen the jaundice	108 (27.1)	36 (18.1)	33 (33.0)	39 (39.0)

G6PD = glucose-6-phosphate dehydrogenase deficiency,

Table III: The practices of care of jaundiced newborn infants among mothers of different ethnic groups in Tuanku Jaafar Hospital

Maternal practices	Total n=154 (%)	Malay n=96 (%)	Chinese n=34 (%)	Indian n=24 (%)
Management of care				
Followed doctor's advice	141 (91.6)	89 (92.7)	28 (82.4)	24 (100)
Followed advice of friends or relatives	4 (2.6)	1 (1.0)	3 (8.8)	0 (0)
Fed infant with goat's milk	5 (3.2)	5 (5.2)	0	0
Bathed infant with Chinese Herbs	3 (1.9)	1 (1.0)	2 (5.9)	0
Others	1 (0.6)	0(0)	1 (2.9)	0
Age of infant when mothers searched for jaundice in their infants:				
Everyday during first 2 weeks	114 (74.0)	66 (68.0)	29 (87.9)	19 (79.2)
Everyday during first 4 weeks	14 (9.1)	12 (12.4)	2 (6.1)	0 (0)
Not sure	26 (16.9)	19 (19.6)	2 (6.1)	6 (20.8)
Looked for jaundice in baby's eyes	117 (76.0)	85 (88.5)	15 (44.1)	17 (70.8)
Looked for jaundice by pressing on baby's skin	132 (85.7)	83 (86.5)	28 (33.3)	21 (87.5)
Looked for jaundice on infant's skin without pressing it	36 (23.4)	18 (18.8)	14 (41.2)	4 (16.7)
Did not look for jaundice	6 (3.9)	3 (3.1)	2 (5.9)	1 (4.2)
When did mothers consult doctors about their infants after jaundice was detected?				
As soon as jaundice was detected	90 (58.1)	57 (58.2)	20 (58.8)	13 (56.5)
Depended on advice of visiting nurse	60 (38.7)	38 (38.8)	12 (35.3)	10 (43.5)
Waited till jaundice was more obvious	3 (1.9)	2 (2.0)	1 (2.9)	0 (0)
Did not seek medical help	2 (1.3)	1 (1.0)	1 (2.9)	0 (0)
Practiced sunning her jaundiced infant	128 (83.1)	76 (79.2)	29 (85.3)	23 (95.8)
Methods of sunning her infant				
Placed infant naked near windows but away from direct sun	65 (50.8)	47 (61.8)	9 (31.0)	9 (39.1)
Placed infant naked directly under the sun	47 (36.7)	22 (28.9)	15 (51.7)	10 (43.5)
Place infant fully dressed under the sun	15 (11.7)	6 (7.9)	5 (17.2)	4 (17.4)
Others	1 (0.8)	1 (1.3)	0 (0)	0(0)

Table IV: Parental experience and view on health education on neonatal jaundice

Health Education	Total no. of infants n=400 (%)	Malay n=200 (%)	Chinese n=100 (%)	Indian n=100 (%)
Have received health information on neonatal jaundice	198 (49.5)	123 (61.5)	34 (34.0)	41 (41.0)
Agreed that mothers should be educated on neonatal jaundice	376 (94.0)	194 (97.0)	94 (94.0)	88 (88.0)
The most effective method to educate mothers on neonatal jaundice				
One-to-one counseling by a doctor	184 (46.0)	67 (33.5)	68 (68.0)	49 (49.0)
Regular antenatal talk	160 (40.0)	105 (52.5)	17 (17.0)	38 (38.0)
Regular TV program	22 (5.5)	13 (6.5)	3 (3.0)	6 (6.0)
Regular radio program	3 (0.8)	1 (0.5)	1 (1.0)	1 (1.0)
As part of health education in school	5 (1.3)	2 (1.0)	1 (1.0)	2 (2.0)
Regular newspaper write-up	8 (2.0)	2 (1.0)	4 (4.0)	2 (2.0)
As articles in magazine	9 (2.3)	5 (2.5)	2 (2.0)	2 (2.0)
Others	9 (2.3)	5 (2.5)	4 (4.0)	0 (0)

than those who did not have children developing jaundice previously (mean scores: 7.3, 95% CI: 6.8, 7.9); however, this difference was not statistically significant ($p=0.06$).

Among the 282 women who already had children, 154 (54.6%) of them had a past history of their children developing neonatal jaundice. A majority (91.6%) of this latter group ($n=154$) of mothers followed the advice of their doctors in the management of their jaundiced infants (Table III). However, when compared with the Malay mothers, a significantly lower percentage (82.4%) of the Indian mothers followed their doctors' advice ($p=0.03$). Feeding jaundiced infants with goat's milk as a traditional mode of treatment was not a common practice and was confined mainly to the Malays. Bathing jaundiced infants with Chinese herbs as a traditional mode of treatment was also not common and was practiced mainly by the Chinese. Majority (74.0%) of these mothers looked for jaundice in their newborns during the first week of life. Most (76.0%) of them looked at the eyes of their infants and pressed the skin of their infants to look for the presence of jaundice. These practices, however, were least common among the Chinese than the other two ethnic groups. As soon as jaundice was detected in their infants, 58.1% of the mothers of all ethnic groups consulted their doctors themselves, and 38.7% of mothers sought treatment only upon the advice of the visiting nurses. There were a small percentage of mothers who sought treatment only when the jaundice of their infants was more obvious (1.9%) or they sought no treatment at all (1.3%). Majority (83.1%) of the mothers sunned their jaundiced infants. Among them, 48.3% placed their infants directly under the sun, with or without clothing. This practice was more common among the Chinese and Indian than the Malay mothers (Table III).

Less than 50% (Table IV) of the mothers previously received health information on neonatal jaundice. The proportion of mothers receiving such information was significantly higher among the Malays than the Chinese and the Indians ($p<0.001$). A majority of the mothers (94.0%) opined that all Malaysian mothers should received health education on neonatal jaundice. One-to-one counseling by the doctors and antenatal talks by health professionals were the most preferred methods of health education on neonatal jaundice. A significantly larger proportion of the Chinese and Indians

preferred one-to-one counseling by the doctors while a significantly higher proportion of the Malay mothers preferred antenatal talks than the Chinese and Indians ($p<0.001$).

DISCUSSION

The results of the present study showed that, despite a majority of the mothers had received secondary education, their knowledge was inadequate for them to deal with their infants with neonatal jaundice. Chinese and Indian mothers had significantly lower knowledge scores than Malay mothers. This could be partly attributed to their lower education level.

We found a large proportion of the mothers were not aware that neonatal jaundice of early onset was abnormal and needed urgent treatment. They were also not aware that breast-feeding and infection was associated with an increased risk of jaundice. Despite the fact that G6PD deficiency is a common condition in Malaysia, many of the mothers were not aware of the existence of this condition and its role in neonatal jaundice. Although about 70% of them were aware that severe jaundice can cause brain damage and death, only a small percentage of them were aware that hearing loss is common sequela. Our findings were consistent with those of a study reported from Singapore, which found that most of the Chinese parents did not know the causes of neonatal jaundice and its serious consequences⁵.

Similar to the studies reported elsewhere⁵⁻⁷, the present study revealed that placing a jaundiced infant, either naked or fully dressed, directly under the sun was a common practice among Malaysian mothers, and that many of them were not aware that this was not a safe and effective practice. Many were not aware that sunning a jaundiced infant in such a manner increased the risk of dehydration and worsened the severity of jaundice. A report from Singapore⁵ found that most of the Chinese parents got to know about sunning their infants as a method of treating neonatal jaundice from layman instead of healthcare providers. In an Australian study⁶, it was found that a majority of post-partum Australian mothers sunned their infants when they suspected their infants were having jaundice², and most of them sunned

their infants under direct sunlight. In Turkey the idea of exposing jaundice infants under direct sun was based on cultural health beliefs, and Turkish mothers continued with this practice despite the fact that healthcare providers taught them the correct method of sunning their infants⁷.

The findings of the present study show that there is a need to improve the delivery and content of health education to the Malaysian women on neonatal jaundice. There is a need to emphasize to the Malaysian mothers the danger of placing their infants under the direct sun and delaying medical care for their jaundiced infants. In view of the different education levels and cultural practices, these factors should be taken into consideration during the design of education materials and its methods of delivery. As antenatal talks could help educate a larger number of mothers than one-to-one counseling by doctors, further studies should be carried out to explore why a large proportion of the Chinese and Indians did not like antenatal talks by health professional. Factors such as their lower education level and their inability to grasp the contents of the lectures in Bahasa Malaysia could be the barrier to their attendance.

Despite its association with the development of neonatal jaundice, breast feeding should be promoted given its immense benefits to the young infants. To this end, medical professionals should continue to provide one-to-one support for breast-feeding mothers when their newborns develop jaundice. A study by Willis *et al*⁸ showed that interactions with medical professionals emerged as the most important factor in mediating the impact of neonatal jaundice on breastfeeding. They found that breastfeeding orders and the level of encouragement from medical professionals toward breastfeeding had the strongest effect on feeding decisions.

In conclusion, there is still a wide gap of knowledge existing among Malaysian mothers on care of neonatal jaundice. Further systematic efforts to improve the delivery and contents of health education on neonatal jaundice for the Malaysian mothers should be carried out by the Malaysian health authority to close this gap.

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