

ORIGINAL ARTICLE

Maternal Knowledge and Awareness of Neonatal Jaundice in Term Neonates admitted to the Neonatal Intensive Care Unit of the Tamale Teaching Hospital

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Newborn jaundice is a common presentation in the first week of life. In its severe form it can lead to both mortality and long-term disability. Knowledge and awareness on this condition has been shown to vary according to the setting. In this cross-sectional study, we interviewed mothers of babies admitted to the Neonatal Intensive Care Unit (NICU) with jaundice in order to document their knowledge and awareness. We also documented comorbidities in the neonates that could predispose them to severe jaundice. Of the 786 babies admitted over the period, 76 (9.7%) had jaundice. Majority (n=44, 57.9%) were male, of normal birth weight (n=63, 90%) and delivered in a health care facility (n=61, 80.2%). The maternal awareness on jaundice (n=13, 17.1%) and ability to detect the condition (n =9, 11.8%) were low. Neonatal sepsis was the most common risk factor (n=52, 68.4%), followed by ABO blood group incompatibility (n=11, 14.5%) and G6PD defect (n=8, 10.5%). More than 70% (n=54) of babies had total serum bilirubin > 25 mg/dl at presentation. Maternal knowledge and awareness in our cohort was low although most of the babies had major risk factors for developing severe jaundice

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INTRODUCTION

Globally, neonatal jaundice is a very common condition occurring in up to 60% of term neonates in the first week of life (Slusher *et al.*, 2004; Haque *et al.*, 2000) and contributing significantly to both morbidity and mortality, especially in the developing world (Ogunlesi, 2004). Each year, neonatal jaundice contributes about 1.2% of the global neonatal deaths and it is also a leading cause of long-term complications such as kernicterus (GBD, 2013).

Although neonatal jaundice is quite common, severe forms requiring intervention develops in a relatively small percentage of neonates. Early detection and

intervention to prevent progression significantly reduces the morbidity and mortality due to this condition. This depends on the alertness of both health care providers and parents of newborns.

The incidence, etiological and contributory factors to this condition vary according to ethnic and geographical differences (Olusanya *et al.*, 2015). Unlike the developed countries where fetomaternal blood group incompatibilities are the main causes of severe neonatal jaundice, it is mostly prematurity, G6PD deficiency, infective causes as well as effects of negative traditional and social practices such as consumption of herbal medications in pregnancy, application of dusting powder on baby, use of camphor balls to store baby's clothes that mainly constitute the etiology in developing countries (Oladokun *et al.*, 2009; Olusanya *et al.*, 2009; Owa and Ogunlesi, 2009).

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Severe neonatal jaundice can therefore be said to have modifiable risk factors particularly in developing countries (Sarici *et al.*, 2004).

Parental awareness and knowledge, screening for jaundice before discharge and early initiation of phototherapy are key strategies to avoid complications from severe neonatal jaundice (Maisels, 2006).

Studies conducted in this regard however have shown mixed results (Egube *et al.*, 2013; Eneh and Ugwu, 2009) and because many neonates are discharged early from hospitals in developing countries, targeted or general screening opportunities are lost.

In Ghana, a few studies have been conducted on knowledge and awareness of neonatal jaundice among mothers/expectant mothers, both of which were in the southern part of the country (Adoba *et al.*, 2018; Amegan-Aho *et al.*, 2019). Both studies found low knowledge on causes but maternal awareness was reported to be high in one (Amegan-Ahao *et al.*, 2019).

This study was conducted to assess maternal knowledge and awareness of neonatal jaundice in term neonates and to document risk factors for severe jaundice at a Neonatal Intensive Care Unit (NICU) of a tertiary hospital in Northern region, Ghana.

MATERIAL AND METHODS

Study setting

The study was conducted at the NICU of the Tamale Teaching Hospital (TTH), a tertiary facility serving approximately 3 million people at the time of the study. The facility also serves as the clinical teaching site for the University for Development Studies School of Medicine and Health Sciences in Tamale, Northern region of Ghana. The NICU had 20 cots and incubators and four functioning phototherapy units during the study period.

Study Design

This was a cross-sectional study using a structured questionnaire to assess maternal knowledge and awareness of neonatal jaundice.

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Study population

All mothers of babies admitted with neonatal jaundice at the NICU during the study period (February 2013 to July 2013) were identified and interviewed if they met the inclusion criteria of the study.

Sample size determination

The study was planned to run for six months and to include all mothers of newborns who were admitted with neonatal jaundice and who met the study inclusion criteria. A total of 76 neonates were identified as such during the period and their respective mothers (n=76) enrolled in the study.

Inclusion and exclusion criteria

The study included mothers of all term neonates (delivered at $>_37$ completed gestational weeks) admitted with diagnosis of jaundice or who developed jaundice while on admission, requiring at least phototherapy. We excluded babies born preterm and other term babies who were admitted to the NICU with different medical conditions during the period of study.

Data collection tool and procedure

A well-structured questionnaire formulated in English was administered to the mothers after obtaining an informed consent. Where necessary, interpreters were used to translate the questionnaire to Dagbanli and Twi for those mothers who did not understand English. A data abstraction sheet was also used to collect demographic and clinical information of the neonates and maternal antenatal information from the hospital records. The main data collected in this manner were gender of baby, age at presentation, gestational age at birth, birth weight, place of delivery of baby, physical examination findings at presentation and results of laboratory investigations.

Data Analysis

Data obtained from this study was entered into SPSS version 22.0 and analyzed by using descriptive statistics such as frequencies and percentages.

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Ethical Consideration

Permission to conduct this study was obtained from the Research and Development Department of the TTH. In addition, consent was sought from mothers prior to interviews. Mothers were made aware that they could withdraw their consent at any point during the interview. We did not seek formal ethical clearance as the study did not involve interventions or any invasive procedure.

RESULTS

Seven hundred and eighty-one (781) patients were admitted to the NICU during the study period. Of the total admissions, 76 (9.7%) term babies were diagnosed with neonatal jaundice and included in the study.

There were more males (n=44, 57.9%) than females. The average gestational age at delivery was 40 weeks. Seven (10%) of the babies were of low birth weight (LBW), whereas 86.9% (n=60) of the babies weighed between 2.5-4.0kg at birth and 3.9% (n=3) weighed >_4.0kg. Majority of the cases were born in health care facilities (n=61, 80.2%) (Table 1).

When asked whether they had any knowledge on neonatal jaundice, majority (n=63, 82.9%) of the mothers answered in the negative. Only nine (11.8%) mothers were able to detect the yellowish discoloration of the eyes and skin of their babies. The rest (n=67, 88.2%) were detected by either the medical doctor or midwife on duty when the families reported to the hospital (Table 2).

Among the risk factors for severe jaundice, neonatal sepsis (n=52, 68.4%) was the most common. ABO blood group incompatibility (n=11, 14.5%), G6PD defect (n=8, 10.5%), macrosomia (n=3, 3.9%) and rhesus blood group incompatibility (n=2, 2.6%) were the other risk factors identified (Table 3).

With regards to G6PD defect status of the mothers, five (6.6%) had a partial defect and eight (10.5%) had full defect. The rest were normal. More than 70% (n=54) of the babies presented with total serum bilirubin (TSB) >_ 25 mg/dl and in about 12% (n=9) the TSB > 50 mg/dl (table 4).

DISCUSSION

Severe neonatal jaundice was a common presentation to the NICU during the study period.

It was only less common than the 3 main causes of neonatal morbidity and mortality (sepsis, preterm birth complications and birth asphyxia). Despite this and considering that majority of the babies in our study had one or more major risk factor for developing severe jaundice (Table 3), the maternal knowledge, awareness and ability to detect jaundice in this study was suboptimal. This is problematic because ability to detect jaundice early and report promptly for care is key to preventing serious complications, especially bilirubin induced encephalopathy (Maisels, 2006).

This is especially crucial for our setting where severe jaundice is still a common cause of preventable disability and death and majority of the causes have been found from previous studies to be modifiable (Sarici *et al.*, 2004; Owa & Ogunlensi, 2009).

Having knowledge of a disease condition is a starting point to seeking timely medical attention for it. Majority of the mothers had no knowledge of what neonatal jaundice is. Previous studies have shown that mothers who had knowledge of the condition were more likely to report to health facilities for intervention (Said *et al.*, 2018). Our finding of low knowledge and awareness was similar to a previous study conducted in Efutu in the Central region of Ghana (Adoba *et al.*, 2018) but contrary to another study conducted in Accra, Ghana (Amegan-Aho *et al.*, 2019). In the study in Accra, although awareness was high, knowledge of symptoms was poor and this did not change with educational level of mothers. In the current study both of these were poor. This study did not explore factors influencing awareness and knowledge of neonatal jaundice. This may be a limitation of the study.

Naturally, with the low awareness among the mothers in this study, most of them could not detect jaundice in their babies and this was only done by the health care worker when they presented to the health care facility. This is especially worrisome as > 70% of babies presented with total serum bilirubin > 25mg/dl (table 4), a level high enough to warrant exchange blood transfusion and almost all the babies presented with at least one risk factor for

Table 1: Baseline characteristics of patients admitted with neonatal jaundice

Variable	No. of cases (n)	Percentage (100%)
Sex		
Male	44	57.9%
female	32	42.1%
Age(days)		
1-3	28	36.8%
4-6	25	32.9%
7-10	17	22.4%
>10	6	7.9%
Birth weight(Kg)		
>_4.0	3	3.9.0%
3.94-2.5	60	86.9%
2.4-1.5	7	10.0%
Place of delivery		
TTH	39	51.3%
Other health facility	22	28.9%
Home	15	19.8%

Table 2: Maternal awareness and detection of neonatal jaundice

Variable	No. of mothers (n)	Percentage (%)
Awareness		
Yes	13	17.1%
No	63	82.9%
Jaundice detection		
Mother	9	11.8%
Medical Doctor/ Midwife	67	88.2%

Table 3: Risk factors for severe neonatal jaundice among the study participants

Condition	Number (n)	Percentage (%)
ABO incompatibility	11	14.5%
G6PD defect	8	10.5%
Rh incompatibility	2	2.6%
Neonatal sepsis	52	68.4%
Macrosomia	3	3.9%
Total	76	100.0%

Table 4: Serum bilirubin levels of neonates on admission

Total serum bilirubin (mg/dl)	Number (n)	Percentage (%)
15 – 20	9	11.8%
20.1 -25	13	17.1%
25.1 – 30	13	17.1%
30.1 – 35	7	9.2%
35.1 – 40	9	11.8%
40.1 – 45	9	11.8%
45.1 – 50	7	9.2%
>50	9	11.8%
Total	76	100.0%

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developing severe jaundice (table 3) (AAP, 2004; Maisels, 2006)). As majority of the mothers were delivered in health care facilities, we think this provide a unique opportunity to screen for risk factors and educate mothers on danger signs including jaundice before they are discharged. This can only be achieved if the health care providers themselves are aware of the risk factors for jaundice.

A further study may be required to explore knowledge attitudes and practice in health care providers in this regard.

Our study had a number of limitations. Firstly, the study did not explore factors influencing knowledge, awareness and ability to detect jaundice in mothers assessed. Secondly, the small sample size also made it difficult to draw conclusions on our findings. Despite these limitations, the findings imply that providers along the continuum of care from antenatal clinics to postnatal clinics should seize every opportunity to educate mothers about this important condition. Another strength of the study is that, to the authors knowledge, this is the first study in Northern Ghana that assesses maternal knowledge and awareness of neonatal jaundice, hence the findings constitute valuable information for clinicians and researchers.

Conclusion

In conclusion, this study found low awareness and knowledge of neonatal jaundice in mothers of babies admitted with the condition.

This is despite the fact that majority of the babies were admitted with very high serum bilirubin levels and had risk factors for developing severe jaundice from birth.

Future studies should look at knowledge attitudes and practice among health care providers to guide development of educational programs for both mothers and care providers.

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Conflict of interest: None to declare

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