

Original Research Article

Neonatal jaundice: assessing the knowledge and intending practice of clinical medical students of Bingham University Teaching Hospital, Jos Nigeria

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ABSTRACT

Background: Neonatal jaundice is one of the major causes of neonatal morbidity and mortality in Nigeria. There is the need therefore to equip our young upcoming doctors about the disease. Aim of this study was to assess the knowledge of clinical medical students of Bingham University Teaching hospital on Neonatal Jaundice (NNJ).

Methods: This was a cross-sectional study carried on clinical medical students of Bingham University Teaching Hospital, Jos. Ethical approval was obtained from the Ethical committee of the Hospital. A semi-structured questionnaire was used to obtain data from 400-600L students using convenience sampling method for all those that consented to the study.

Results: A total of 181 students were assessed with a M: F ratio of 1:1.2, age ranged of 18-30 years. About 98% of the students got the definition of jaundice correctly. There was no significant correlation between the definition of NNJ with age, sex educational level and tribe of the students. The major source of information was from their lectures and seminars accounting for 80% of sources. The assessment of the knowledge on the cause of NNJ was good with 145(80%) knowing that hematological/hereditary disease is a cause, 4(2.2%) did not know the cause of NNJ. The highest score for danger signs of NNJ was 98(54%) which was high pitch cry. About 60% of the students knew that blue light is the best colour of light for effective phototherapy, while 42(23%) did not know the answer. There was correlation between the intending practice and the educational level of the students $p=0.016$.

Conclusions: The knowledge of some of the causes and the treatment of NNJ among the BHUTH was good and others were poor, therefore, more teachings and exposures need to be done.

Keywords: Bingham University Teaching Hospital, Jaundice, Jos, knowledge, Neonatal, Students

INTRODUCTION

Neonatal jaundice (NNJ) is the yellowish discolouration of the sclera, skin and mucous membrane in a baby of 0-28 days of life due to accumulation of bilirubin in the body.¹ Jaundice also known as hyperbilirubinemia is a consequence of excessive production, decreased hepatic

uptake or impaired conjugation of bilirubin, intra-hepatic cholestasis, hepatocellular injury and extra hepatic obstruction.^{2,3} Newborns are predisposed to more bilirubin production due to the fact that they have red cells with a shorter life span, a higher rate of hemolysis, inadequate caloric intake with increased enterohepatic circulation, and an underdeveloped conjugating system.⁴⁻⁶

Neonatal jaundice is one of the most common conditions seen in newborn babies that needs urgent medical attention.⁷ About 75% of neonates develop clinically apparent jaundice in the first week of life.⁸ Neonatal jaundice is seen in about 50% of full-term newborn babies and 80% of preterm babies. It accounts for about 75% of hospital re-admissions worldwide.⁹⁻¹⁰

Unconjugated hyperbilirubinemia that is not urgently and properly managed can cause acute bilirubin encephalopathy. Acute bilirubin encephalopathy leads to brain damage (kernicterus), a chronic neurological problem that causes a lot of neurological handicap and early deaths in affected infants. Untreated neonatal unconjugated hyperbilirubinemia remains a leading cause of preventable brain damage, mental handicap, physical disabilities and early death among infants.¹¹

One of the important contributors to the high morbidity and mortality rate seen in sub-Saharan Africa is neonatal jaundice (NNJ).^{12,13} This is in contrast to developed country, where morbidity and mortality from complications of neonatal unconjugated hyperbilirubinemia is between 0.4 to 2.7 cases per 100,000 live birth in North America and Europe.² The study done by Bhutani et al, documented that twenty-four million which was 18% of 134 million live births of ≥ 32 weeks of gestational age from 184 (mostly underdeveloped) countries were found to be at risk for neonatal hyperbilirubinemia associated with adverse outcomes.¹⁴

Ogunfuwa et al, in Lagos found out that only 51% of community health workers (CHW) knew the correct and adequate definition of NNJ, 54% knew the effective treatment, while 15% and 10% will give drugs and sunlight as the treatment respectively and herbal medication was also mentioned as a source of treatment by 3% of the health workers.⁹ Aggarwal et al, found that only 15% knew phototherapy/ EBT as a form of treatment for NNJ.¹⁵ Another study by Orimadegun et al, in Ibadan among CHW also showed that 82% had poor knowledge and 46% had wrong practice on NNJ.¹⁶

Health workers are known to be a major source of information to mothers.¹⁷ It is not surprising then that studies done by Goodman et al, in Lagos among mothers, showed that only 34% knew that brain damage is a complication of untreated NNJ and 64% taught that sunlight is an adequate form of therapy for NNJ.⁸

Ezeakar et al, also in Lagos found out that only 25% of mothers knew the correct definition of NNJ and 79% got the treatment wrong.¹⁸ Egube et al, in Benin found that 52% of mothers don't know the danger signs of NNJ.¹⁹

Studies done in Africa and other developing countries also showed that the knowledge, attitude and practice of mothers to NNJ is poor.²⁰⁻²³ There was an association between knowledge, attitude and practice with some

demographic factors like age, occupation, religion, parity, ethnicity and level of education.^{15,20,23-26}

There seems to be a gap in the knowledge on NNJ by some health workers who are the major source of information to mothers. Therefore, it is necessary to evaluate the knowledge of medical students who will soon become a major force among health workers so as to breach the gap in knowledge.

To the best of my knowledge there has not been a study to assess the knowledge of medical students on NNJ. The study done by Naveed et al on NNJ was done among Pharmacy students and it showed that 70% of them knew the causes of NNJ while about 63% had knowledge about the treatment. The study assessed the knowledge of the clinical students of BHUTH on NNJ.

METHODS

This was a cross-sectional study done for the 400L, 500L and 600L students of Bingham University Teaching hospital, Jos. The study population were the clinical students of Bingham University Teaching Hospital Jos. The survey instrument was a self-designed questionnaire by the authors, consisting of a 23-item questionnaire.

The questionnaire had two sections which covered questions on socio-demographic characteristics like age, sex, tribe, religion, level of education of the students and knowledge/intending practice regarding neonatal jaundice. Questionnaires were administered after obtaining informed consent from the students. A convenience sampling method was used to obtain the calculated sample size of 181.

Inclusion criteria

- All clinical medical students of BHUTH, Jos who consented to the study.

Exclusion criteria

- All clinical medical students of BHUTH, Jos who did not consent to the study.
- All non-clinical medical students of Bingham University.

Ethical approval was obtained from the Ethical Committee of BHUTH before the commencement of the study. The study was conducted from April 2019-June 2019. Data collected were analyzed using Statistical Package for Social Science (SPSS) version 22.

Tables and Pie charts were used to show frequencies, Chi-square statistical test and Fisher's exact test were used to test association between the socio-demographic characteristics of the students and their knowledge and intending practice towards neonatal jaundice. The level of significance was set at p value less than 0.05.

RESULTS

The socio-demographic variables of the students showed that the male to female ratio was 1:1.2, the age range with the highest frequency was 21-25 years with about 86%. The least number of students recruited were those in 400L with 23% Table 1. The knowledge on the definition of NNJ revealed that 178(98%) of the students got the definition correctly.

Only 3(2%) got the definition wrong. There was no significant difference with the definition of NNJ and all the demographic variables Table 2. Assessment on the cause of NNJ showed that, the most known causes are hematological/hereditary disease with 145(80%), followed by blood group incompatibility 139(77%).

The commonest site to look for jaundice was the eyes with 178(98%). The least complication of NNJ known by the students was arching of the back 42(23%). Table 3.

Phototherapy as the treatment for NNJ was known by 161(89%) of the students, and 128(80%) also knew that Exchange blood transfusion (EBT) is a form of treatment. As high as 58(33%) did not know the effective colour of the light used for phototherapy Table 4.

Table 1: Demographic distribution of the study.

Variable	Frequency	Percentage
Age group		
15-20	12	6.6
21-25	155	85.6
26-30	12	6.6
31-35	2	1.1
Total	181	100.0
Sex		
Male	83	45.9
Female	98	54.1
Total	181	100.0
Tribe		
Yoruba	27	14.9
Igbo	21	11.6
Hausa	3	1.7
Others	130	71.8
Total	181	100.0
Student level		
400	41	22.7
500	91	50.3
600	49	27.1
Total	181	100.0

Table 2: Correlation between the definition of NNJ and demographic variables.

Variable	What is neonatal jaundice			X ²	Df	p
	Correct	Wrong	Total			
Sex						
Male	81(97.6)	2(2.4)	83(100)	0.532	1	0.595*
Female	97(99.0)	1(1.0)	98(100)			
Total	178(98.3)	3(1.7)	181(100)			
Age group						
15-20	12(100.0)	0(0.0)	12(100.0)	0.512	3	1.000*
21-25	152(98.1)	3(1.9)	155(100.0)			
26-30	12(100.0)	0(0.0)	12(100.0)			
31-35	2(100.0)	0(0.0)	2(100.0)			
Total	178(98.3)	3(1.7)	181(100.0)			
Student level						
400	39(95.1)	2(4.9)	41(100.0)	4.187	2	0.071*
500	91(100.0)	0(0.0)	91(100.0)			
600	48(98.0)	1(2.0)	49(100.0)			
Total	178(98.3)	3(1.7)	181(100.0)			
Tribe						
Yoruba	27(100.0)	0(0.0)	27(100.0)	1.197	3	1.00*
Igbo	21(100.0)	0(0.0)	21(0.0)			
Hausa	3(100.0)	0(0.0)	3(100.0)			
Others	127(97.7)	3(2.3)	130(100.0)			
Total	178(98.3)	3(1.7)	181(100.0)			

*= Fischer's exact test.

Table 3: Assessment on the causes, sites to look for jaundice and danger signs of NNJ.

Variable	Frequency(n=181)	Percentage	
Causes of neonatal jaundice.	Blood group incompatibility	139	76.8
	Hematological/hereditary disease	145	80.1
	Infectious disease	91	50.3
	Breastmilk jaundice	91	50.3
	Use of naphthalene balls	76	42.0
	Some medications given during labour	54	29.8
	G6pd- deficiency	112	61.9
	I don't know	4	2.2
	Prematurity	68	37.6
	Delayed breastfeeding	33	18.2
What are the sites to look for jaundice?	Eyes	178	98.3
	Skin	160	88.4
	Soles/palms	80	44.2
	Colour of stool/urine	66	36.5
	What are the danger signs?		
	Fever	95	52.3
	High pitch cry	98	54.1
	Weakness	71	39.2
	Upwards rolling of the eyes	50	27.6
	Refusal to feed	80	44.2
	Convulsions	86	47.5
	Arching of the back	42	23.2
	Fast breathing	45	24.9

Table 4: Assessment on the types of treatment, effective colour of light used for treatment and the complication of NNJ.

Variable	Frequency (n=181)	Percentage
What is the treatment for neonatal jaundice?		
Expose to sunlight	78	43.1
Herbal medication	1	0.6
Antibiotics	25	13.8
Phototherapy	161	89.1
Glucose water	10	5.5
Exchange blood transfusion	128	70.7
I don't know	5	2.8
What's the effective colour of light for phototherapy?		
Red	1	0.6
Green	1	0.6
Blue	101	55.9
White	26	14.4
I don't know	58	33.0
Do you think NNJ has complication?		
Yes	173	95.6
No	6	3.3
No response	2	1.1
What are the complications of NNJ?		
Blindness/deafness	56	30.9
Delayed developmental milestones	123	70.1
Death	101	58.8
Cerebral palsy	103	57.0
Seizure disorder	79	43.6
I don't know	15	8.3

Table 5: Assessment on the prevention and the drugs used for the treatment of NNJ.

Variable		Frequency (n=181)	Percentage
How to prevent neonatal jaundice?	Prevent prematurity	71	39.2
	Prevent infections	84	46.4
	Prenatal screening and follow up	136	75.1
	Give ampiclox	7	3.9
	Early initiation of exclusive breast feeding	70	38.7
What drugs are used in the treatment of NNJ?	Ampiclox	12	6.6
	Glucose water	11	6.1
	Other antibiotics/injections	28	15.5
	Herbal concoctions	2	1.1
	Early morning sunlight	53	29.3
	Phenobarbitone	35	19.3
	Multivitamin	23	1.7
	I don't know	41	22.7

Table 6: Correlation between intending practice and sociodemographic variables.

Variable	Intending practice on NNJ			X ²	Df	p
	Correct	Wrong	Total			
Sex						
Male	73(88.0)	10(12.0)	83(100.0)	3.997	1	0.046
Female	94(95.9)	4(4.1)	98(100.0)			
Total	167(92.3)	14(7.7)	181(100.0)			
Age group						
15-20	12(100.0)	0(0.0)	12(100.0)	1.272	3	0.865*
21-25	142(91.6)	13(8.4)	155(100.0)			
26-30	11(91.7)	1(8.3)	12(100.0)			
31-35	2(100.0)	0(0.0)	2(100.0)			
Total	167(92.3)	14(7.7)	181(100.0)			
Student level						
400	35(85.4)	6(14.6)	41(100.0)	6.985	2	0.016*
500	83(91.2)	8(8.8)	91(100.0)			
600	49(100.0)	0(0.0)	49(100.0)			
Total	167(92.3)	14(7.7)	181(100.0)			
Tribe						
Yoruba	27(100.0)	0(0.0)	27(100.0)	3.710	3	0.345*
Igbo	20(95.2)	1(4.8)	21(100.0)			
Hausa	3(100.0)	0(0.0)	3(100.0)			
Others	117(90.0)	13(10.0)	130(100.0)			
Total	167(92.3)	14(7.7)	181(100.0)			
Source of information						
Health care worker	18(100.0)	0(0.0)	18(100.0)	4.228	3	0.164*
Social network	11(84.6)	2(15.4)	13(100.0)			
Lectures/seminar	134(92.4)	11(7.6)	145(100.0)			
Relatives/friends	3(75.0)	1(25.0)	4(100.0)			
Total	166(92.2)	14(7.8)	180(100.0)			

*= Fischer's exact test.

To prevent NNJ, 136(75%) believed that prenatal screening and follow up will help, and 7(3.9%) believed that the giving of ampiclox to the baby will prevent NNJ. The use of early morning sunlight is believed to be a form of treatment of NNJ by 53(29%) of the students. Table 5. There was no significant association between the

demographic variables and the intending practice on NNJ by the students Table 6. Figure 1 showed that the major source of information about NNJ was gotten from lectures/seminars with 80%, while the least was gotten from friends and relatives with 3%.

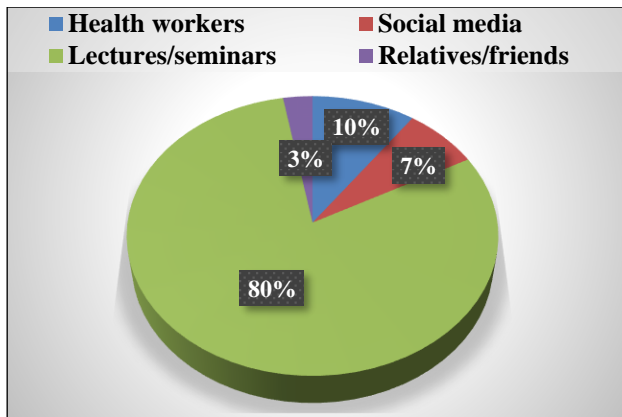


Figure 1: Sources of information.

DISCUSSION

There were 181 students that filled the questionnaires. The 400L, 500L and 600L students made up 23%, 50% and 27% respectively. The male to female ratio is 1:1.2. They were all Christians and highest tribe was Yoruba with about 15%, followed by Igbo with 11%. The remaining 72% was shared by all the other tribes in Nigeria.

The definition of NNJ was known by over 98% of the students, all the 500L students got the definition correctly, this could be explained by the fact that the posting of pediatrics where they see and are taught on NNJ occurs in 500L. Although one would expect that all the 600L students should get the definition correctly because they have also been taught, it's possible that they have forgotten and needed a refresher course as they are now concentrating more on their adult medicine, surgical and other postings. The 400L students had the least percentage of correct definition, this is probably because they are just starting their clinical posting and have not been exposed to pediatrics were, they learn more about neonatal jaundice. Generally, the knowledge about definition of NNJ was more in this study compared to that gotten by Ogunfowa et al, where only 51% of the community workers got the accurate definition of NNJ.⁹

This could be explained by the fact that medical students are taught about neonatal jaundice and they are exposed to neonates managed in pediatric wards during their pediatric posting than the community workers. The study done by Ezeakar et al, on the mother's perception on NNJ showed that only 25% of them got the definition of NNJ correctly.¹⁸

The major source of information was their lectures and tutorials with 80% which was not surprising because they are taught on NNJ as medical students. However, 13(7%) got their information from the internet. This is in contrast to the study done by Alfouwais et al, where more than half of the participants got their information on NNJ from relatives and friends and study done by Onyearugha et al, showed that more than half got their information from health care workers.¹⁷

The knowledge on the cause of NNJ was good with more than two-third of the students knowing that hematological/hereditary disease and ABO incompatibility can be a cause NNJ. This is comparable to what Naveed et al got with also about 2/3rd of the pharmacy students getting to know the cause of NNJ. However, this is in contrast with the study done by Egube et al, where only 18% knew that ABO incompatibility is a cause of NNJ. Ezeakar et al, found over 70% of the participants don't know the cause of NNJ, while Alfouwais et al, found 63% don't know any cause of NNJ.^{18,27} The reason for this disparity could be because all these studies were done among mothers while this present study was done among medical students.

For the warning signs of NNJ, 54% of the students recognized high pitch cry and 47% of the student recognized upward rolling of the eyes as a warning sign. About half of the students knew that death could be a complication of NNJ. The low level of knowledge about the danger signs and some complications of NNJ could be because some of the students have had only theoretical knowledge on NNJ and have not done their posting in Pediatrics where they will be exposed to babies with NNJ. This is in contrast with study done by Egube et al, where only 29% and 2% recognized high pitch cry and upward rolling of the eyes as a danger signs.¹⁹ Onyearugha et al, recorded 88% of the responded not knowing any danger signs at all.¹⁷ In the study done by Aggarwal et al, about half of the subjects don't know about the danger signs of NNJ and two-thirds don't know about the long time complications.¹⁵

The knowledge on the treatment of NNJ was good with more than two-third knowing about the use of phototherapy and EBT. This is comparable to what Ogunfuwa et al, obtained among health workers where about 50% of them could identify phototherapy and EBT as the form of treatment in NNJ.⁹ This is in contrast to what was revealed by studies done among mothers by Huq et al, where about 62% will use traditional remedies for their treatment, in Aggarwal et al, 52% of the subjects will use traditional remedies and 40% don't even know of any treatment.^{15,21}

There was a significant relationship between the intending practice of the students on NNJ and their educational level. This is because the students in 500 and 600L had been taught NNJ in lectures, tutorials and seminars and have done their Pediatric posting where they had clinical and practical knowledge on how to identify, investigate and manage a case of NNJ. There was however no association between the intending practice and the other demographic variables. This is similar to what was obtained by Aggarwal et al, Mohammed et al, Rodrigo et al, where the knowledge, attitude and practice was associated with some major demographic variables like level of education, parity and age.^{15,20,26} The reason for the association in these studies could be because the level of education of the mothers in

those studies varied significantly from illiterates, semi illiterates and well educated mothers.

CONCLUSION

The study showed that the knowledge and intending practice of NNJ was generally fair among medical students when compared to other health workers and mothers. There will be need for the medical students to have continued teachings, reminder and exposure on NNJ so they will be able to educate other healthcare workers and mothers when they graduate so as to prevent the severe morbidity and mortality associated with improper and late treatment of NNJ.

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