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Neonatal resuscitation – knowledge and practice of nurses in western Nigeria

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Background. Appropriate resuscitation techniques are crucial to the survival of newborn infants.

Objective. To assess knowledge of nurses in western Nigeria about neonatal resuscitation.

Method. A cross-sectional survey of the nurses attached to secondary health facilities in western Nigeria was done using a closed-ended questionnaire that tested evaluation and appropriate action aspects of neonatal resuscitation.

Results. One hundred and seventy-nine nurses were interviewed. Of these, 72.6% had worked in the labour room and the special care baby unit within the last 5 years while only 14.0% had attended neonatal resuscitation training course within the last 5 years. Similarly, 31.8%, 53.1%, 58.1% and 35.2% had access to radiant warmers, ambu-bags, suction machine and oxygen delivery units, respectively. The knowledge of the respondents was better for evaluation than for appropriate action (95.5% v. 49.7%).

Conclusion. The knowledge of the respondents about appropriate actions to be taken during neonatal resuscitation was poor. Frequent and intensive courses on neonatal resuscitation are highly desired.

Early neonatal death is often due to perinatal events such as severe perinatal asphyxia, infections and prematurity, and is a major contributor to infant mortality.[1] A difficult delivery can result in perinatal asphyxia if appropriate resuscitation is not available.[2] Improvement in the quality of neonatal resuscitation (NR) techniques is therefore crucial to the reduction of early neonatal deaths and, by extension, reduction in the infant mortality rate in the developing world.[3]

The few deliveries that take place in orthodox health facilities are mostly conducted by nurses. This is similar to reports from West Bengal[4] and Zimbabwe.[5] It is imperative that these nurses are versatile in appropriate cardiopulmonary resuscitation of newborn babies.[6] The objective of this study was to assess nurses' knowledge about NR at a secondary health care level in western Nigeria.

Methods

This was a cross-sectional survey of nurses attached to general and state hospitals (secondary health care level) in the south-western geopolitical zone of Nigeria, conducted between February and March 2006. The participants were drawn from four hospitals located at Ibadan, Ijebu-Ode, Ijero-Ekiti and Ilesa, using the random sampling technique. One general or state hospital was randomly selected from four states in the zone. Each selected hospital was visited on a single day between 08h00 and 16h00 and all the nurses met on duty during this period were surveyed after obtaining informed verbal consent.

We did not use the Neonatal Resuscitation Index[7] because its scope is beyond the focus of this study. However, similar to the study conducted in Cambodia,[8] the tool for this survey was derived from a standard reference.[6] This tool was a self-administered, close-ended questionnaire that was pre-tested in another general hospital. Following the pre-test, the questionnaire was redesigned to reflect better relevance and clarity of the questions. The questionnaire sought demographic data and also contained 20 simple statements arranged in two sections. Section I tested the evaluation and identification of babies requiring assistance (Table I), while section II tested appropriate decisions and actions such as appropriate warming, stimulation, airway clearance and ventilation techniques (Table II). The answers were 'Yes', 'No' or 'Do not know'. Every correct response earned 1 mark while incorrect responses earned no mark. 'Do not know' was also regarded as an incorrect answer. A minimum score of 75% defined adequate knowledge in each section and for overall assessment.

The survey data were analysed with SPSS version 11.0 software using the odds ratio (OR) and its 95% confidence intervals (CI). Statistical significance was established when confidence intervals for the odds ratio did not include unity or p-values were ≤0.05 in two-tailed tests.

TABLE I. THE TOOL USED TO ASSESS KNOWLEDGE OF EVALUATION IN NEONATAL RESUSCITATION

1*	Meconium-stained liquor does not suggest that the newborn may require neonatal resuscitation.
2*	Mucus extractor and infant Ambu-bags are not always required in a delivery room.
3	Respiratory efforts, colour and heart rate (or cord pulsation) are used to decide if a newborn infant requires resuscitation.
4*	After warming, sucking and drying, if an infant remains apnoeic, the least important step is to Ambu-bag.
5	After delivery, it is important to ascertain that the heart rate is above 100/min.
6	Cyanosis and heart rate less than 100/min are danger signs in newborn infants.

*Negatively framed statements.

Results

A total of 179 nurses were interviewed. The durations of their nursing practice after qualification were as follows: <5 years – 49 (27.4%), 5 - 10 years – 48 (26.8%), 11 - 20 years – 36 (20.1%), and >21 years – 46 (25.7%).

Exposure of participants to neonatal care and resuscitation

Only 25 (14%) participants had attended a NR training course in the last 5 years. Ninety-one (50.8%) and 39 (21.8%) had worked in the delivery rooms and special care baby units, respectively, within the last 5 years. The others worked in the lying-in ward (17; 9.5%) and in other wards and clinics not directly related to neonatal care (32; 17.9%).

One hundred and seven participants (59.8%) had personally resuscitated newborn babies within the past year, while the remaining 72 (40.2%) had not.

Availability of resuscitation equipment

The following resuscitation equipment was available to the participants: radiant warmer (57; 31.8%), oxygen (63; 35.2%), neonatal Ambu-bag (95; 53.1%), electrical suctioning device (104; 58.1%) and disposable mucus extractor (170; 95%).

Assessment of knowledge of NR

Overall, 78.8% of the participants had adequate knowledge of NR (sections I and II). Specifically, 95.5% had adequate knowledge of evaluation (section I) while 49.7% had adequate knowledge of appropriate decisions and actions (section II).

Of the participants 150 (83.8%) had adequate knowledge about identification of neurologically depressed newborn infants, while 130 (72.6%), 162 (90.5%), 130 (72.6%) and 173 (96.6%) had adequate knowledge about provision of warmth, tactile stimulation, airway clearance and ventilation, respectively.

Relationship between NR experience of participants and knowledge of NR

Participants who had previously worked in the delivery room and special care baby unit had better knowledge of NR than those who had not, and this difference was statistically significant (83.1% v. 67.3%; OR 2.38, CI 1.05 - 5.40, p=0.022). Similarly, a significantly higher proportion of participants

Although most of the participants had adequate knowledge about evaluation of newborn infants, their knowledge of appropriate decisions and actions during NR was low.

TABLE II. THE TOOL USED TO ASSESS KNOWLEDGE OF APPROPRIATE DECISIONS AND ACTIONS IN NEONATAL RESUSCITATION

1	The correct order of INITIAL resuscitative measures include: *Keeping warm, sucking, positioning, drying* and *stimulation.*
2*	Determination of Apgar score is the first step in neonatal resuscitation.
3	The first step in INITIAL resuscitation is warming the infant up.
4*	Hydrocortisone injection is important in neonatal resuscitation.
5*	One pre-warmed towel is adequate for neonatal resuscitation.
6*	The nose of a newborn infant should be suctioned before the mouth.
7	The Ambu-bag appropriate for a newborn must cover the nose, mouth and chin.
8*	Suctioning of the airways should be continuous when secretions in the airways are 'excessive'.
9	Chest compressions (external cardiac massage) must be accompanied by Ambu-bagging.
10*	Holding aloft and slapping the buttocks is an acceptable way to stimulate an apnoeic baby.
11	The BEST way to assess the success of Ambu-bagging is to observe a rise and fall in the chest wall.
12*	Exposure to HEAT (provided by a hot water bottle) may stimulate a newborn baby who has apnoea.
13	During Ambu-bagging, breaths should be delivered at the rate of 40 - 60 times per minute.
14	When co-ordinating ventilation and chest compression, one session of ventilation is done after every 3 chest compressions.

*Negatively framed statements.

who had recently attended an NR training course than of participants who had no such training had adequate knowledge of NR (96% v. 76%; OR 7.59, CI 1.03 - 155.78, p=0.023).

Discussion

The findings in this study suggested that although most of the participants had adequate knowledge about evaluation of newborn infants, their knowledge of appropriate decisions and actions during NR was low. This study focused on the secondary health care level nurses who often attend to obstetric cases referred from the primary health care level.[4]

The better performance among participants who had attended NR training courses, as well as those who had previously worked in the delivery room and the special care baby units, lent credence to the need to specifically acquire knowledge of NR and have the opportunity to put the knowledge into practice.

Almost all the participants had adequate knowledge about evaluation, while knowledge of appropriate decisions and actions skills was low. This translates into inability to act appropriately even when a baby who needs resuscitation has been identified. The reason for this disparity is not clear, but we speculate that it may reflect the persistence of certain obsolete nursing practices.

The lack of essential neonatal resuscitative equipments observed in this study has also been reported in Zimbabwe and South Africa[9,10] and may be a reason why good NR skills are failing to develop, since the acquired knowledge cannot be put into practice.

Frequent NR training needs to be organised for better retention of the skills acquired and better performances during NR,[11] since attendance at NR courses has been shown to improve NR skills in Malaysia.[12]

The restriction of participants to secondary health facilities may be a limitation of this study, but our findings are reliable since the participants were drawn from urban, semi-urban and rural parts of south-western Nigeria.

Conclusion

The introduction of routine and periodic NR training programmes may improve the NR skills of nurses, who often attend deliveries in the developing world. This is essential for improved survival of newborn infants.

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