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Awareness about retinopathy of prematurity among nurses working at neonatal intensive care unit of Nampula central hospital in Mozambique, 2021

Abstract

Introduction: Retinopathy of prematurity is a bilateral dysfunction of abnormal retinal vascularization in preterm infants, especially those with very low birth weight. The consequences range from normal vision to blindness. In recent years, the survival rate for the extreme group of patients with prematurity has increased from 8% to 35% in middle-income countries, as well as its early identification of retinal damage and institution of appropriate treatment to prevent blindness and provide children with better overall development. The natural evolution of the disease generates a high social and financial cost for the entire community, since in its more advanced stages it causes severe and irreversible damage to vision, also impairing the entire cognitive and psychomotor development of the affected child.

Objective: The aim of the study was to document the awareness about Retinopathy of Prematurity among nurses working at neonatal intensive care unit of Nampula Central Hospital in Mozambique.

Methods: A questionnaire was designed on awareness pattern. The questionnaire included questions about nurses education and experience, knowledge of screening guidelines, risk factors for Retinopathy of Prematurity, diagnose and treatment and it was applied to16 nurses working at neonatal intensive care unit of Nampula Central Hospital in Mozambique. It was a self-administered questionnaire, collected in October 2021.

Results: The total number of the sample was 16 nurses, 87.5% were female and 12.5% were male. The mean age of study participants was 35.9 ± 7.3 years old. It was observed that the age of respondents shows predominance towards 40 years and above. Regarding the working experience at the neonatal intensive care, 43.75% of participants ranged from 1-4 years. Among the most cited risk factors; indicated professional to perform the eye exam; timing to perform the eye exam and the indicated treatment for Retinopathy of Prematurity, the following stand out: Low gestational age (56.25%);Retina Specialist(75.0%); Depends of Gestational Age (56.25%) and Cryotherapy alongside with Laser Photocoagulation and surgery (31.25%).

Conclusion: The results of the study suggest that most nurses working in the neonatal Intensive care unit services of Nampula Central Hospital were aware about the prevention, diagnose and treatment of Retinopathy of Prematurity. The findings indicate the need for dissemination of information through seminars, workshops and internal educational activities to improve nurses' awareness about the clinical condition.

Keywords: Awareness, Pre-term, Neonatology, Retinopathy of Prematurity

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Abbreviations: ROP, retinopathy of prematurity; PTNB, preterm newborns; GA, gestational age; IVH, intraventricular haemorrhage; IMR, infant mortality rate; NICU, neonatal Intensive care unit

Introduction

The first years of life are very significant for the development of eyes and vision, any interruption in this phase can cause severe visual impairment or even blindness. The eye examination in children is not only a child's right, but also a necessity to monitor and assess the eyes and visual structure.[1] In recent years, interest in the mechanism of ocular neovascularization has grown a lot. Several authors agree that vasculogenesis and angiogenesis are the result of complex interactions between growth factors or locally and systemically produced mitogens, which stimulate the inhibition of differentiation, proliferation, migration and construction of endothelial cells. This process is responsible for diseases such as diabetic retinopathy or retinopathy of prematurity.[2] Retinopathy of Prematurity (ROP) is a vasoproliferative disease secondary to inadequate retinal vascularization that occurs in preterm newborns (PTNB).[3]

The most consistent risk factors for the appearance of ROP are birth weight ≤ 1,500 grams, gestational age(GA) ≤ 32 weeks and high concentration oxygen therapy for a long period of time. Among the less consistent factors are lack of vitamin E and A, exposure to bright light, sepsis, prolonged mechanical ventilation, Apgar score, pulmonary complications, anaemia, intraventricular haemorrhage (IVH) and necrotizing.[4,5] Retinopathy of Prematurity is one of the most important causes of treatable childhood blindness in industrialized countries and has become increasingly prevalent in lower-middle income countries. The guidelines for neonatal screening in the search for the disease were defined and focused on the following risk group: preterm infants with Birth Weight ≤ 1500 grams and/or with a GA ≤ 32 weeks.[6-8]

ROP is under constant study around the world due to the increased survival of newborns from preterm birth, within the groups at greatest

risk for the onset of this disease: very low birth weight and extremely premature babies. In recent years, the survival rate for the extreme group of patients with prematurity has increased from 8% to 35% in middle-income countries, as well as its early identification of retinal damage and institution of appropriate treatment to prevent blindness and provide children with better overall development.[9,10]

Although the prevalence of childhood blindness is very high in countries with an infant mortality rate (IMR) of more than 60 per 1000 people born as is the case in sub-Saharan Africa, very little or no ROP is recorded in these countries because of the lack of facilities of intensive care for preterm infants and their low survival rates. In industrialized countries with IMRs in less than 10 per 1000 live births, ROP is responsible for 6-20% of childhood blindness.[11] Diagnosis is performed with the aid of eye exams between the 4th and 6th week of life and must be performed by an experienced ophthalmologist with competent training in the diagnosis and treatment of retinal diseases in paediatric patients.[12] During the last decade, Neonatal care has changed with increasing centralization, implementation of new therapies and provision of intensive care for extremely low gestational age infants. These changes have contributed to a growing population of survivors in Neonatal Intensive Care Units today. The incidence of ROP in these extremely premature babies is therefore still a topic of discussion.[13, 14]

The natural evolution of the disease generates a high social and financial cost for the entire community, since in its more advanced stages it causes severe and irreversible damage to vision, also impairing the entire cognitive and psychomotor development of the affected child.[15] The treatment of choice for ROP has long switched from cryotherapy to peripheral diode laser photocoagulation soon after clinical studies showed that laser therapy is superior to cryotherapy. However, the acute risks of laser photocoagulation include corneal edema, intraocular hemorrhage, and cataract formation.[16] Although laser treatment of infants at risk for severe ROP decreases retinal detachment and reduces blindness by 25%, eye morbidity due to blindness is not reduced by treatment and makes preventive efforts desirable.[17] The importance of ROP lies in its frequency and prevention of blindness due to this condition, as, once diagnosed and treated, it is unlikely to develop into complete loss of vision. The incidence of blindness varies between countries and is influenced by the level of newborn care and the existence of screening programs for early diagnosis.[18]

Timely screening and detection of ROP at the correct time can save the vision and change the life of the child. ROP can be treated successfully, only if detected at the right time. The role of nursing staff in the neonatal intensive care unit is critical in the successful prevention of ROP induced blindness. They also provide counseling on the importance of follow-up eye examination after discharge from the neonatal intensive care unit. We designed a cross-sectional study to assess the awareness related to ROP among nurses involved in Neonatal care at Nampula central Hospital in Mozambique. To the best of our knowledge, no studies were done in Mozambique concerning ROP screening or awareness among Nurses working at neonatal Intensive care unit. The findings of this study would provide a strong foundation to develop strategies towards the enhancement of their knowledge about ROP.

Objective

To document the awareness about Retinopathy of Prematurity among Nurses working at neonatal intensive care unit of Nampula Central Hospital in Mozambique.

Methods

Prior to data collection, the research protocol was reviewed and approved by the Lúrio University Institutional Bioethical Review Board. The study followed the ethics guidelines of the Declaration of Helsinki (2013). Because the data were collected only by using the interviewer administered questionnaire, written informed consent was obtained from each of the study participants. The written informed consent was approved by the Lúrio University Institutional Review board. All the study participants were informed about the purpose of the study, their right to refuse and withdraw from the study at any time. Participants confidentiality was fully protected through an anonymous questionnaire by excluding identifiers and using codes. Moreover, personal data was secured by storing data in a password-protected computer not used by others. It was a cross-sectional non-interventional descriptive study, conducted in a governmental and north Mozambique regional reference Hospital that contains neonatal intensive care unit and has an ophthalmology department. There is not a protocol as a referral guidance that allows communication between intensive neonatal care unit and Ophthalmology department to screen cases with high risk for ROP. The data were collected in October 2021. A self-administered semi-structured questionnaire was framed on the awareness about the risk factors, screening timing and professionals as well as the treatment pattern. It was gathered and modified from other questionnaires of similar published researches to assess knowledge, screening, referral barriers and treatment of ROP. The Questionnaire was translated to Portuguese by a Portuguese specialist Lecturer at Lúrio University. Therefore the back translation was performed to ensure language equivalence between the English and Portuguese versions of the scale by an English specialist lecturer at Lúrio University. Three optometry experts provided opinions about meaning and content sufficiency. A pilot study was conducted with 5 nurses of a similar population from 1st to 5th October 2021 to determine whether there were any unclear questions in the scale. The data from the pilot study were then excluded from the final data analysis. All nurses who were on leave due to prior notice, maternity leave and vacations, and those who refused to participate in the study or abandon the study midway through its course and those whose questionnaires were not legible to the point of compromising the understanding of the information were not included in the survey. Data from the study forms was coded and entered in an MS Excel spread sheet. The distribution of responses is presented as a proportion. Frequency distribution and central tendency measures (mean, median and standard deviation) were used to summarize the descriptive part of the study.

Results

Demographic characterization of study population

The mean age of study participants was 35.9 ± 7.3 years old, 12.5% were male and 87.5% were female. The most representative age group was above 40 years consisting of 37.5% when compared with those aged 30 to 34 corresponding 25.0%; 25 to 29 comprising 18.75%. The representative working time of the participants in the Neonatal Care Unit ranged 1 to 4 years, corresponding to 43.75% when compared to those ranged below 1 year with 31.25% and those which have between 5 to 9 years of experience with 18.75% while the participants with more or equal to 10 years of experience were the minority, represented by 6.25%.The Whole information regarding the basic Characteristics of the study population is demonstrated in the Table 1.

Table 1 Demographic Characteristics of study population

Variable	Frequency	Percent
Gender	2	12.5
Male	14	87.5
Female		
Age (Years)		
20-24	1	6.25
25-29	3	18.75
30-34	4	25
35-39	2	12.5
≥ 40 Years	6	37.5
Years of experience in the NICU		
< 1 Year	5	31.25
1-4	7	43.75
5-9	3	18.75
≥ 10 Years	1	6.25

Awareness about risk factors and who performs screening for retinopathy of prematurity

Regarding the awareness of risk factors, 56.25% of the study participants mentioned low gestational age, 25.0% mentioned sick required oxygen, and 12.5% appointed weight less than 1800g and 6.25% were not aware about the causes of retinopathy of prematurity.

About who performs the screening for retinopathy of prematurity, 75.0% of the participants responded towards retinal specialist and 25.0% indicating a paediatric ophthalmologist. Table 2 shows the percentage of Nurses with respect to their awareness about the risk factor and who performs the eye test.

Table 2 Awareness about the risk factors and who performs the screening of retinopathy of prematurity

Variable	Category	Frequency	Percent
Causes of ROP	Low gestational age	9	56.25
	Weight less than 1800 g	2	12.5
	Sick require oxygen	4	25
	Don't know	1	6.25
Eye test to be performed By	Retina Specialist	12	75
	Pediatric ophthalmologist	4	25
	Don't know	0	0

Awareness about screening timing and Treatment of retinopathy of prematurity

In this study, 56.25% of the nurses mentioned that the period for the first eye examination depends of gestational age, 31.25% appointed the period of 4-6 weeks of age and 12.5% were not aware about the period for the first eye exam.

About the treatment, 31.25% equal mentioned Cryotherapy, Laser and Surgery as elective choice of treatment for retinopathy of prematurity and 6.25% were not aware about. Table 3 summarize the information regarding the awareness of the nurses towards the timing of screening and the treatment of ROP

Discussion

Retinopathy of Prematurity (ROP) is a multifactorial disease and a leading cause of blindness in children. If it is not discovered and treated, during the children's stay in the Neonatal Intensive Care Unit, it can cause significant visual sequel or total and irreversible blindness.[19]

Table 3 Awareness of participants regarding the timing of screening and the treatment of ROP

Variable	Category	Frequency	Percent
Period for first eye Exam	4-6 Weeks of Age	5	31.25
	6-12 Weeks of Age	0	0
	Depends of Gestational Age	9	56.25
	Don't Know	2	12.5
Treatment of ROP	Cryotherapy	5	31.25
	Laser	5	31.25
	Surgery	5	31.25
	Don't Know	1	6.25

A careful anamnesis with a focus on maternal and neonatal risk factors, in addition to family members, with ophthalmological evidence, should be routine, as should the adoption of a known screening test.[20] In our study we found that only 56.25% of the Nurses were aware about the risk factors of ROP and 100.0% knew about who should perform the eye exam. Only 31.25% knew that the first eye exam should be performed between 4-6 week of age and 31.25% mentioned the laser Photocoagulation as the elective treatment alongside with cryotherapy.

The existence of a neonatal care unit neonatologist or pediatrician is important to ensure proper screening for ROP in infants. It is also important that general practitioners and family physicians are aware of the guidelines and timing of triage, especially in areas where there are fewer Neonatal support services. It is equally important to train more ophthalmologists in the diagnosis and management/treatment of ROP as well as improving awareness of screening criteria and guidelines.[21] In the best of our knowledge, there is no study published on awareness for ROP among nurses in Mozambique. According to Santos *el al*.[22] regarding the screening timing for ROP, 87.5% of nurses believed that the exam should start between the 4th and 6th week of life.[22] This finding is much higher than the one funded in the current study. The study performed by Thuileiphy *et al*.[23] demonstrated that 100% of the nurses were able to correctly identify the risk factors for ROP. [23] This Finding is very high if compared with the current study.

Conclusion

This is the first study performed in Mozambique to access the awareness about ROP among nurses of Neonatal Intensive care Unit. More studies to provide evidence based data to the policymakers are of extreme importance in order to line up the Health Care System with the need of accurate and solid communication between the Ophthalmologists and neonatal Care unit to the best of the patients care. There are no data regarding the prevalence of ROP in Mozambique, however the number of survivor pre-term babies are growing due to the changes and developments regarding the neonatal care in developed countries, the rate of disability due to ROP in the mid-income countries such as Mozambique may increase proportionally with the number of pre-term babies if considering the lack of strategies to early screen this babies and provide the appropriate care.

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Conflicts of interest

The authors declare they have no conflicts of interest with research performance or manuscript elaboration and publishing.

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