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Nursing care with the eye protector of newborns submitted to phototherapy

ABSTRACT | ABSTRACT | Objective: To evaluate nursing care with eye protection for newborns. Method: Descriptive investigative study, with a qualitative approach, carried out in a teaching hospital, located in the city of Fortaleza-Ceará, Brazil, January to February 2016. The study included 15 nurses who cared for newborns undergoing phototherapy, at the Intermediate Care and Intensive Care. Data collection took place through unstructured interviews. Results: The eye protector is used to prevent injury to the retina of newborns, and there are risks in the use of this artifact and, to avoid damage, essential care directed to newborns under phototherapy is performed. Conclusion: The care that nurses provide to newborns is carried out in a systematic way, combining humanization and technology.
Keywords: Newborn; Phototherapy; Nursing care; Neonatal Intensive Care Units; Eye Protection Devices.

RESUMEN | Objetivo: Evaluar los cuidados de enfermería con protección ocular para recién nacidos. Método: Estudio descriptivo de investigación, con abordaje cualitativo, realizado en un hospital universitario, ubicado en la ciudad de Fortaleza-Ceará, Brasil, de enero a febrero de 2016. Participaron del estudio 15 enfermeras que asistieron a recién nacidos en fototerapia, en el Intermedio. Cuidados y cuidados intensivos. La recolección de datos se realizó mediante entrevistas no estructuradas. Resultados: El protector ocular se utiliza para prevenir daños en la retina del recién nacido, existen riesgos en el uso de este artefacto y, para evitar daños, se realizan cuidados esenciales dirigidos al recién nacido sometido a fototerapia. Conclusión: La atención que brindan las enfermeras al recién nacido se realiza de manera sistemática, combinando humanización y tecnología.
Palabras claves: Recién nacido; Fototerapia; Cuidado de enfermera; Unidades de Cuidados Intensivos Neonatales; Dispositivos de protección ocular.

RESUMO | Objetivo: Avaliar os cuidados de enfermagem com o protetor ocular em recém-nascidos. Método: Estudo investigatório descritivo, com abordagem qualitativa, realizado em hospital-escola, localizado na cidade de Fortaleza-Ceará, Brasil, janeiro a fevereiro de 2016. Participaram do estudo 15 enfermeiras que prestavam cuidados a recém-nascidos em fototerapia, na Unidade de Cuidados Intermediários e Terapia Intensiva. A coleta dos dados ocorreu por meio de entrevista não estruturada. Resultados: O protetor ocular é utilizado na prevenção de lesão na retina de recém-nascidos, sendo que existem riscos na utilização desse artefato e, para evitar danos, são realizados cuidados essenciais direcionados aos recém-nascidos sob fototerapia. Conclusão: Os cuidados que as enfermeiras prestam aos recém-nascidos são realizados de forma sistematizada, aliando humanização e tecnologia.
Palavras-chaves: Recém-nascido; Fototerapia; Cuidados de Enfermagem; Unidades de Terapia Intensiva Neonatal; Dispositivos de Proteção dos Olhos.

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INTRODUCTION

Jaundice is characterized by being the most evident clinical manifestation of hyperbilirubinemia in plasma, being able to be noticed when serum levels of total bilirubin are above 5-7mg/dl. One of the most frequent changes in newborns (NB), about 60% to 70% full-term newborns (FTN) and 80% to 90% preterm newborns (PTNB) develop jaundice. [1]

Neonatal jaundice is known worldwide, its frequency varies widely among the population of different institutions, due to racial differences, breastfeeding practices, hemolytic and genetic conditions. Risk factors in neonatal hyperbilirubinemia involve breastfeeding, prematurity, blood incompatibility (Rh or ABO), infection, cephalomatoma, asphyxia, glucose-6-phosphate dehydrogenase, and genetic variants. [2]

For the treatment of hyperbilirubinemia in newborns, phototherapy is the most used, as it is a non-invasive method, with a high impact in reducing plasma bilirubin levels, without restrictions, with regard to the newborn's maturity, the existence or not of hemolysis or degree of skin pigmentation. [1] It consists of placing the newborn under a fluorescent light source. Since the discovery, several models have been proposed for the mechanism of the action of light on the skin. It is accepted that the absorbed light degrades the bilirubin impregnated in the skin, transforming it into water-soluble derivatives that will be eliminated from the organism, without the previous need for hepatic conjugation. [3]

The newborn submitted to phototherapy requires special care and needs a multidisciplinary team, particularly nursing, who assist him 24 hours, thus requiring professionals able to diagnose and perform interventions with agility and efficiency in intercurrences. [1]

To ensure the effectiveness of the treatment, some precautions are necessary, such as removing the newborn to facilitate the incidence of light rays over the largest possible extension of the body surface and properly protecting the eyeballs with an opaque mask, in order to avoid damage to the retina. [4]

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Perceptions about phototherapy treatment symbolize uneasy situations for mothers, such as fear of light and sadness. These feelings need to be perceived with special attention on the part of nursing professionals, so that guidance is given to these mothers. In this way, what causes the greatest negative impression on the treatment is associated with the use of ocular blindfolds, referred by mothers as uncomfortable and that hurt the baby's eyes, in addition to preventing them from experiencing the sensation of the "eye to eye" interaction. [4] Thus, some nursing care is essential for the care with the newborn's eye protector, such as fixation, maintenance of the protector, effectiveness in eye protection and knowledge of the nursing team about the care related to phototherapy.

Faced with the considerations on the theme, the need arose to seek answers to the question: what are the nursing care with the eye protector of newborn infants undergoing phototherapy?

In this way, the study will serve as a subsidy for professional practice in view of the essential care provided to newborns undergoing phototherapy, who use eye protection. In addition, it will contribute to the fundamental scientific knowledge for nursing and other works related to the theme.

Considering this problem, the objective was to evaluate nursing care with eye protection in newborns undergoing phototherapy.

METHOD

This is a descriptive investigative study, with a qualitative approach, carried out in a teaching hospital, at a tertiary level, located in the city of Fortaleza-Ceará, Brazil, from January to February 2016.

Fifteen nurses participated in the study, aged between 25 and 51 years, with experience in the area varying between 10 and 15 years. The inclusion criteria established for the study were: nurses, of both sexes, regardless of age, training time and experience in the

area, who would provide direct care to newborns in phototherapy at the NICU (Neonatal Intermediate Care Unit) and the Neonatal Intensive Care Unit of the referred institution, during the data collection period. Professionals who were away from the units, by any nature, were excluded. Thus, the number of subjects in the research is based on the saturation criterion [5], before the speeches of the participants.

Data collection took place through unstructured interviews and indirect observation, carried out individually with nurses working at The neonatal intermediate care units and the Neonatal Intensive Care Unit about nursing care with the eye protector in newborns under phototherapy, upon invitation direct to professionals. The interviews lasted, on average, 30 minutes and the information was recorded with the aid of a voice recorder. It is important to mention that the speeches were transcribed in full and the empirical data from these reports were read, grouped by similarity and, finally, categorized through content analysis.

The study was approved by the Ethics Committee of the referred Institution, according to opinion No. 1.356.305, respecting the ethical and legal aspects of Resolution 466/12 of the National Health Council. [6] In order to guarantee the anonymity of the participants, they were identified in the text by the letter E, referring to the term nurse, followed by Arabic numerals.

RESULTS

From the nurses' speeches, three major categories emerged about the use of care with the standard eye protector in newborns under phototherapy: Use of eye protector to prevent risks to the newborn's health; Essential care with the eye protector for newborns under phototherapy; and Factors intervening in the care of the eye protector.

Use of eye protection in the prevention of risks to the health of newborns

In the speeches, some participants pointed out the retinal injury as one of the main risks in the use of this artifact:

> It is extremely important for the baby using phototherapy to avoid injury to the retina. (E-1)
> The eye protector is essential in phototherapy because it prevents damage to the newborn's retina. (E-2)
> Without it, we would have a lot of retinopathy as a result of phototherapy. (E-3)

Essential care with eye protection for newborns under phototherapy

The participants mentioned some essential care with the eye protector, directed to newborns under phototherapy.

> The eye protector that has to be maintained continuously, this eye protector has to be renewed, [...] every 24 hours, you have to take care also for the size of the protector, not to be a protector that is too small or too large. Too small because it won't protect or too large, because sometimes it occludes the nostril, making it difficult to breathe. (E-1)
> It is the fixation, because when the babies are bigger and become more active, they are not able to make it really seal well and, sometimes, the child removes [...] the proper fixation, because, sometimes, they see adhesive tape that goes from the glasses to the scalp. (E-2)
> Protector fixation; proper closing of the eyes. (E-13)

In addition, some nurses even emphasized the way of using the eye protector, handling and the need for removal.

> At the time of handling to do eye hygiene; at the time of the parents' visit, so that contact occurs; if the NB is breastfeeding at the time of breastfeeding. (E-7)
> It can be withdrawn at the time of breastfeeding to strengthen the mother-child bond, however, the newborn's status and bilirubin values must be evaluated. (E-9)

Factors intervening in the care of the eye protector

Some difficulties were noticed in relation to the care with the standard eye protector, that is, those made in an improvised way.

> Our biggest difficulty here is the maintenance of this protector, because, sometimes, we cannot fix it to the baby's skin, so it does not stick well, so it is one of the biggest difficulties we have. So, we use the micropore in direct contact with the skin and then put on the glasses and the adhesive tape on top. Since the tape should never come into contact with the baby's skin and, sometimes, the micropore, if the baby is more hairy and everything, it can loosen, so, we have a little difficulty in fixing the baby, premature babies extremes, we have used hydrocolloid instead of micropore because, sometimes, we get better results. (E-1)
> The difficulty is because there are no glasses that are, well, ready. They are manufactured here at the NICU, the nursing techniques are the ones that make these glasses and, sometimes, the size, here at the NICU, when they are extremely premature, there are cases of babies weighing 500, 600 grams and the glasses, sometimes,

> are too big for them. Another difficulty that I find is the fixation, because sometimes it gets loose and we find a baby with tape that is totally wrong, it can be attached to the hair, the baby's hair and everything. (E-3)

As for the use of other models of eye protection, the nurses replied:

> There is a protector that is a sponge, it protects well, it can even be reduced when it comes to fixation, it is well sealed, now in relation to it being 100%, it will never be, that this sponge is just a tiara, so it remains mobile in the same way, because it does not fix. (E-2)
>
> Protectors manufactured by the industry in various sizes with adequate safe and comfortable coverage. (E-10)
>
> Something adjustable to the head circumference of each newborn individually (tapes with velcro, for example), covered with suitable material and preferably disposable. (E-13)

DISCUSSION

Nurses working in the investigated service demonstrated to understand the importance of some care with the eye protector for the effectiveness of phototherapy treatment in newborns. However, in order for the treatment to be more effective, several precautions are extremely necessary, to adequately protect the globes and prevent damage to the retina. [4] During the procedure that can last for hours and days, the NB must wear eye protection to prevent progressive retinal damage caused by light rays. [7]

In view of the eye risks resulting from phototherapy, it is pertinent that eye care should be given extra attention by the nursing team, given that the absence of this care is capable of causing loss of visual capacity, representing adverse consequences on the newborn. [8] For this reason, the use of perfect eye protection is essential. [7]

It should be noted that, despite its broad benefits, phototherapy is not without risks. According to the nurses who participated in the study, phototherapy may cause damage to the retina, however, the risks are not restricted to this only, and may also cause water loss in the newborn, increased bowel movements, changes in red blood cells, lethargy, erythema, decrease growth in second childhood, tanning, burns, and the possibility of injuring the retina. [2] In another study [1], when asked the professionals about the possible side effects and/or complications that may occur in newborns undergoing phototherapy, 25,8% indicated only retinal injury and 19,3% did not know how to inform.

In phototherapy, effectiveness is directly dependent on the amount of energy released in the wavelength corresponding to the absorption of light by the bilirubin molecule, the wavelength (color) and the intensity of the irradiance (energy) of the source used. [1] Still, the effectiveness of phototherapy depends mainly on the intensity and wavelength of the light and the proportion of body surface area exposed to light. Simple Phototherapy (SP) is the most commonly used method and, when bilirubin levels approach the threshold for blood transfusion, intensive phototherapy is indicated. Another study reported that phototherapy in the presence of bilirubin resulted in a marked drop in ATPase activity and greater susceptibility to lipid peroxidation in neonatal erythrocytes. [2]

Thus, eye protection is necessary, and degeneration of the retina due to exposure to light may occur as a complication, so it is essential to use excellent eye protection. No statistically significant association has yet been found regarding the use of phototherapy and changes in the conjunctiva. Opaque and adequate eye protection should be used on the eyes, removing only during breastfeeding, bathing and visits, taking care not to be out of phototherapy for more than half an hour. [1]

Therefore, the need to monitor the irradiance measurement of phototherapy devices, the neonate's exposure to light, the distance of the neonate to the light source, the change of position, eye protection and water replacement are highlighted as important factors that interfere with the effectiveness of phototherapy treatment. [1]

However, in a study carried out with nursing professionals who assist NBs from two teaching hospitals in Alagoas-PE, among nurses, 67% reported having routine eye hygiene, 27% denied the existence and a professional did not answer this question. Of those who responded positively, 40% said they used saline or distilled water; 30%, saline; 10%, distilled water; and 20% did not inform the solution used. [8]

In the present study, it was mentioned about the newborn's eye hygiene with eye protector under phototherapy, however it was noticed that the nursing team found difficulties in providing care to the newborn, with regard to the eye protector, given that they need to have time with the care plans and a considerable number of NBs in the unit (not to be greater than the number supported), so that the team is able to closely monitor the displacement of the protector that occurs when the NB moves or pulls the protector.

Using improvised eye protectors can cause damage to the newborn, such as superficial irritation of the epidermis caused by adhesives or minor injuries. An eye protector has already been designed to be used during phototherapy applications in newborns that provides the elimination of all disorders perceived when protection is improvised. [8]

It was evidenced in the statements that care about fixing the protector should be taken, since they are usually attached improperly, with adhesive tape that can

pull the newborn's skin, in addition to attacking the skin that, many times, is not fully formed and still very sensitive. When the NBs arrive at the unit, the protector is often already made, becoming larger or smaller for the size of the NB, given that they do not have a device to regulate it, according to its head circumference. The protector can be produced with any resistant opaque, sterile or sterile material (cotton fabric, flexible plastic film, pressed cellulose fiber, or with a combination of these materials), with an anatomical design that allows the superficial positioning in the eye sockets and, through cut in the middle portion, adapts to the projection of the nose. [7]

In the researched hospital, the protectors are made and developed by the institution's professionals, with products that they have in the service, such as cotton wrap, gauze, micropore and adhesive tape (for fixation). However, this method can compromise the baby's retina and, in addition, its fixation is flawed, requiring professionals to provide part of the service time to make these protectors and send them for sterilization.

In this way, phototherapy, in addition to preventing the mother/baby love relationship, is a treatment that needs special care and specific guidance for the caregiver and, especially, for the mothers who play an important role in the participation of the care for the child. It is necessary, therefore, to praise the effective communication of the health team with the mother of the newborn under phototherapy, so that she is aware of the treatment, risks and benefits, so that she can experience the experience of witnessing her child under phototherapy in a lighter way. [7] The participation of the nursing team is exposed as valuable in reducing communication barriers.[8]

For mothers of newborns undergoing phototherapy, it is understood that if there is no effective communication between the health team and the parents and/or family members, there may be greater problems, especially for the mother who, due to being hospitalized in the maternity hospital and, therefore, closer to the baby, she feels responsible for transmitting information to the family, which she herself does not know and does not understand. [7]

Mothers feel insecure, frightened and worried, in addition to believing that phototherapy can cause more harm than good to their children.[4,9,10] Therefore, there is a need to provide mothers with the necessary information, considering beliefs, feelings and cultural values, so that they feel valued and calm in relation to the benefits of this therapeutic modality.

The protectors available on the market are varied and follow the same principle for protection: better fixation, adhesion easily, without causing damage to the newborn's skin and different sizes. Therefore, the importance of using more modern technologies that aim to reduce skin lesions, to optimize time in service, quality and safety for professionals and to reduce risks, such as the injuries that phototherapy causes in the newborn's retina, favoring the recovery of the newborn under phototherapy and sensitizing nurses to the effective use of the eye protector.

CONCLUSION

The study revealed that nurses provided care to newborns using eye protectors submitted to phototherapy, which were carried out in a systematic way, combining science, humanization and technology.

For more effective care, an alternative found would be the eye protector available on the market, but at a high cost, not having easy consent by SUS, thus limiting adherence to it.

The scarcity of few studies in the literature limited the depth of the discussion on the theme of this research. Therefore, it is clear that in order to provide qualified nursing care, knowledge, training, humanization and material resources are urgent, since these patients need more specific care because of this comorbidity. This nursing assistance in phototherapy must be based on practices based on scientific evidence, so that it can improve the direction of care for the eyes of newborns when using the eye protector.

References

1. Gomes NS, Teixeira JBA, Barichello E. Cuidados ao recém-nascido em fototerapia: o conhecimento da equipe de Enfermagem. Rev Eletr Enferm. 2010; 12(2):342-7.
2. Chagas F, Benito L. Encefalopatia bilirrubínica em neonatos: revisão de literatura [monografia]. Brasília (DF): Faculdade de Ciências da Educação e Saúde; 2014.
3. Durán M. Efectividad de la fototerapia en la hiperbilirrubinemia neonatal. Enfermería Universitaria. 2015; 12(1):41-5.
4. Menezes P, Vasconcelos M. Tratamento fototerápico: repercussão do conhecimento e atitude das mães no cuidado ao filho [dissertação]. Recife (PE): Centro de Ciências da Faculdade Federal de Pernambuco; 2012.
5. Minayo MCS. Análise qualitativa: teoria, passos e fidedignidade. Ciênc Saúde Coletiva. 2012; 17(3):621-6.
6. Ministério da Saúde (BR). Conselho Nacional de Saúde. Comissão Nacional de Ética em Pesquisa - CONEP. Resolução nº 466, de 12 de dezembro de 2012. Diretrizes e Normas Regulamentadoras de Pesquisa Envolvendo Seres Humanos. Brasília: Ministério da Saúde; 2012.
7. Oliveira C, Casati P, Fernandes JJ, Oliveira AR, Alves ED, Oliveira CS. Fototerapia, cuidados e atuação da enfermagem. UNICIENCIAS. 2011; 15(1):141-52.
8. Gonçalves PA, Moreira TFR, Lúcio IML, Mascarenhas MLVC, Lisboa CB, Oliveira LM. Cuidados oculares ao recém-nascido sob fototerapia: conhecendo a prática de enfermagem. J Nurs UFPE. 2016; 10(7):2386-94.
9. Lima F, Félix L. Compreensão das mães sobre o tratamento fototerápico [trabalho de conclusão de curso]. Aracaju (SE): Universidade Tiradentes; 2015.
10. Campos ACS, Barroso MGT. A enfermagem e a fototerapia: a luz que cuida e a luz que trata. Revista Nursing. 2003; 59(6):34-37.