

INFECTION PREVENTION AND CONTROL
IN NEONATAL INTENSIVE CARE UNITElisiane LORENZINI^a, Tatiane Costa da COSTA^b, Eveline Franco da SILVA^c

ABSTRACT

This study was aimed to identify the knowledge of the nursing team of a Neonatal Intensive Care Unit (NICU) on infection control, identifying the factors that facilitate or hinder the prevention and control of Healthcare Associated Infections (HCAI). A descriptive study using a qualitative research method conducted with three nurses and 15 nurse technicians, who work in a NICU of a charitable organization, in southern Brazil. It became evident that the nursing staff had great knowledge about the factors that facilitate the prevention and control of HCAI in NICU, the most important factor being proper hand hygiene. Among the factors that hinder infection prevention and control are to overcrowding and excessive workload. The efficient performance of the nursing staff is an important part of the strategy for prevention and control of HCAI.

Descriptors: Infection control. Cross infection. Neonatal nursing. Intensive care units, neonatal.

RESUMO

Objetivou-se identificar o conhecimento da equipe de enfermagem de uma Unidade de Terapia Intensiva Neonatal (UTIN) sobre o controle de infecção, identificando os fatores que facilitam ou dificultam o controle e prevenção das Infecções Relacionadas à Assistência a Saúde (IRAS). Estudo descritivo com abordagem qualitativa, realizado com três enfermeiras e 15 técnicas de enfermagem, que atuam em uma UTIN de uma instituição filantrópica, na região sul do Brasil. Evidenciou-se que a equipe de enfermagem possui grande conhecimento sobre os fatores que facilitam a prevenção e controle das IRAS em UTIN, sendo o principal, a higienização das mãos. Entre os fatores que dificultam o controle e prevenção, estão a superlotação e a excessiva carga de trabalho. A atuação eficiente e qualificada da equipe de enfermagem constitui-se em estratégia de prevenção e controle das IRAS.

Descritores: Controle de infecções. Infecção hospitalar. Enfermagem neonatal. Unidades de terapia intensiva neonatal.

Título: Prevenção e controle de infecção em unidade de terapia intensiva neonatal.

RESUMEN

Se objetivó identificar los conocimientos del equipo de enfermería de una Unidad de Terapia Intensiva Neonatal (UTIN), sobre el control de infección, identificando los factores que facilitan o dificultan el control y prevención de las Infecciones Relacionadas a la Atención a la Salud (IRAS). Estudio con abordaje cualitativo, realizado con tres enfermeras y quince técnicas de enfermería, que actúan en una UTIN de una institución filantrópica, en la región sur de Brasil. Se ha evidenciado que el equipo de enfermería tiene gran conocimiento sobre los factores que facilitan la prevención y control de las IRAS en UTIN, siendo la principal, higienización de las manos. Entre los factores que dificultan el control y prevención están el hacinamiento y la excesiva carga de trabajo. La actuación eficiente y cualificada del equipo de enfermería se constituye de estrategias de prevención y control de las IRAS.

Descriptorios: Control de infecciones. Infección hospitalaria. Enfermería neonatal. Unidades de cuidado intensivo neonatal.

Título: Prevención y control de la infección en la unidad de cuidados intensivos neonatal.

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INTRODUCTION

Healthcare Associated Infections (HCAI) are a major problem for the safety and quality of life of the patient. Besides, their impact may result in death, prolonged hospitalization, long term disability, considerable financial impact on healthcare institutions and high cost for patients and their family members⁽¹⁾.

Due to the high incidence of HCAI in Brazil, it is estimated that 3% to 15% of hospitalized patients develop Nosocomial Infection (NI)⁽²⁾, the Ministry of Health created the Nosocomial Infection Control Program (PCIH), which is a set of actions carried out deliberately and systematically, in order to reduce to a minimum the incidence of these infections. Ordinance No 2.616/98 regulates the National Infection Control Program (CCIH) and the establishment of the Committee of Nosocomial Infection Control (CCIH). Among the various duties of the CCIH is continuing education with the purpose of prevention and control of these HCAI⁽³⁾.

Despite all the efforts of the WHO and the Ministry of Health, a recent publication in an international journal reveals that one important challenge faced by Brazil is reducing healthcare acquired infections. The authors consider this problem of a great magnitude, once many hospitals count on poorly-structured PCIHs and do not prioritize sanitary surveillance⁽⁴⁾. There is also evidence that these infections are a major cause of neonatal morbimortality in developing countries⁽⁵⁾.

The HCAI in the Neonatal Intensive Care Units (NICU) are those acquired in the intrapartum period (of maternal origin and occurring in the first 48 hours of life), during hospitalization, or 48 hours after discharge, except for transplacental infections⁽⁶⁾. Newborns need special attention and care, because their skin is the main port of entry for these infections⁽⁷⁾. Thus, the nursing team of neonatal intensive care units and CCIH must work together to detect possible failures in order to improve the quality of life of the newborn⁽⁸⁾.

There are several risk factors in a NICU, including: invasive procedures, length of stay, low birth weight, early contact with parents. All these factors can trigger a higher proliferation of HCAI,

impairing the recovery and the quality of life of the newborn⁽⁹⁾.

The motivation for choosing this theme occurred in the classes of the discipline Infection Control in Healthcare Services, during the undergraduate course in nursing of one of the authors. After much research on electronic databases, it was found that, despite the importance of the topic in healthcare, few studies were conducted on the prevention and control of HCAI in NICU. In this context, the present research concerns the questions about the knowledge of professionals about the risks of infection in neonatal intensive care and how to prevent them.

In view of these considerations, this study aimed to identify the knowledge of the nursing team of a Neonatal Intensive Care Unit (NICU) on infection control, identifying the factors that facilitate or hinder the control and prevention of Healthcare Associated Infections (HCAI).

METHOD

This is a descriptive study using a qualitative research method. We chose this approach because it implies the understanding/interpretation of the meanings and significances that an individual gives to the referred phenomena⁽¹⁰⁾.

The investigation was performed in a neonatal ICU of a charitable institution located in a city of the southern region of Brazil. Eighteen (18) members of the nursing staff (three nurses and 15 nurse technicians) participated in this study). The inclusion criterion was: being a NICU employee hired more than three months ago. Nurses with management positions were excluded. The determination of the number of participants was based on the saturation based criterion, defined when the information collected contain a large number of repetitions, that is, the researcher understands that new statements are negligible in view of the objectives initially proposed for the study⁽¹⁰⁾.

Data collection was performed during the month of September 2012, through semi-structured interviews elaborated by the researchers, composed of 11 questions on infection control in neonatal ICUs. The interviews were scheduled with the participants and individually conducted in the facilities of the referred institution. With

permission of the participants, the interviews were recorded on a digital recorder and then transcribed for better use of the data.

The processing of the data was based on the technique of thematic content analysis, which is aimed to obtain descriptions of the content of the messages, through systematic and objective procedure. This analysis involves three stages: 1) pre-analysis, for organization of the materials, in order to facilitate the understanding of the ideas. Thus, there were thorough and repeated readings of data transcripts; 2) the exploration of the material, which is the systemic administration of decisions taken previously, that is, the selection of the statements of the participants interviewed and the organization of categories; 3) and in the third stage the results and their interpretation were processed⁽¹¹⁾. The thematic categories listed a priori were: factors that contribute to prevention and control of HCAI in NICU, and factors that hinder the prevention and control of HCAI in NICU.

The study observed the guidelines of Resolution 196/96 of the National Health Council, was authorized and approved by the Research Ethics Committee of the charitable institution under number 82.629/2012. To guarantee the anonymity of the respondents, these were identified by letter I (interviewee) followed by a number according to the chronological order of the interviews (I01, I02, ..., I18).

RESULTS AND DISCUSSION

The characterization of the participants showed that all were females in the age range 20-43. Eight participants had one to five years of education; eight had six to ten years of education and two had more than ten years of education. Two of the three nurses interviewed had completed a postgraduate course *lato sensu* (neonatology and pediatric and adult emergency).

Factors that contribute to the prevention and control of HCAI in the NICU

In their statements the respondents demonstrated knowledge about prevention and control of HCAI in NICU. Such knowledge became evident when they reported the main methods of control and prevention:

Hand washing, use of alcohol gel, gloves, sterilization at the time of medication [...]. (E01)

I think that hand washing is the most important thing you can do, a good hand washing. (E14)

Hand washing, use of alcohol gel, gloves, and cleaning of incubators. (E18)

In these statements the respondents showed the extent of their knowledge, because they believe that hand hygiene (HH) is the primary method to prevent and control HCAI in the NICU. Studies show that the best way to prevent infections in the hospital setting is correct HH before and after each patient contact^(6,12). This procedure is recognized as the most important and less expensive to prevent the transmission of HCAI⁽¹²⁾. The best way to stop the transmission of antimicrobial resistant organisms is correct HH, to reduce HCAI due to contact with patients, which may contribute to reduce the incidence of resistant bacteria.⁽¹³⁾

However, despite the evidence and the availability of products and techniques for proper HH, many health professionals do not disinfect their hands effectively, failing to perform HH in approximately 60% of the cases where this procedure would be necessary or indicated⁽¹⁴⁾. Other findings corroborate such evidence, reporting that health professionals are aware of proper HH and recognize the importance of this measure in the prevention of cross infections, and yet they do not disinfect their hands correctly^(6,7). Thus, despite the great epidemiological value of HH in the prevention of HCAI, adherence to this measure has been one of the main challenges for the CCIH, since the HCAI are associated to low adherence of health professionals to HH⁽¹⁵⁾.

The use of alcohol gel in HH and the use of 70% alcohol for the cleaning of materials were also mentioned by respondents in this study. The best and safest way to disinfect materials and surfaces is the use of 70% alcohol.⁽¹⁶⁾

Besides HH, the participants of the study recognize other methods that contribute to the prevention and control of HCAI in NICU, as the controlled use of antimicrobials:

[...] do not administer antibiotics unless needed [...]. (E06)

Although the use of antibiotics is recommended only when appropriately described, the nursing team is attentive and aware that their indiscriminate use may cause several health problems to the newborn, because the excessive use of antimicrobial agents is a factor that predisposes to possible HCAI, since bacterial resistance in an individual with a compromised immune system can be potentially fatal. So, we must ensure the rational use of these drugs, preventing the spread of antimicrobial resistance⁽¹⁷⁾.

The participants also stressed the importance of avoiding cross contamination, as follows:

[...] if she is in a room, as in the isolation, that [nurse technician] does not leave the room to prevent contamination [...] if she is assisting a newborn in the isolation room, she will not take care of other babies. (E17)

[...] When performing a procedure you should always be careful to prevent contamination, avoid handling a patient and then touching another one is very important; handling only when needed. (E09)

[...] because if you are not careful you touch a patient, and then another one; so you should always remember to wash your hands before and after touching the newborns [...]. (E03)

It is known that these infections are often spread on the hands of healthcare workers. The skin of infants is the main gateway of pathogenic microorganisms, and around 80% of preterm infants develop some type of skin lesion until the first month of life and approximately 25% of all premature and low birth weight newborns will have at least one episode of sepsis until the third day of life^(5,7).

The guidance for parents regarding the handling of their newborns was mentioned as an important factor that contributes to the prevention of HCAI, as shown in the following excerpt of the statement of C10:

[...] guidance to the parents, many parents come from the streets, they should wear lab coats, and most don't wear [...] but is always good to be more careful, it is always good. (E10)

Health education, through guidance, is an important strategy for preventing infections.

However, one of the major obstacles faced by healthcare professionals is that the family members fail to understand the sources of risks. The close proximity of parents to their newborns is very important because the infants need much care and comfort for their recovery and stability. Besides, parents feel excluded without these gestures. Yet allowing and encouraging parents in the NICU is not sufficient to prevent and control HCAI. It is also necessary to guide infection prevention measures, as well as the proper way to handle their babies, touching them with the utmost possible care, teaching them to prevent and monitor infections in the NICU. It is known that infections are caused by many factors, such as the condition of the patient, the severity of the disease, the number of visits by family members and length of stay. Nevertheless, if there is no control of these factors by the nursing team, there will be a greater tendency of proliferation of HCAI⁽¹⁸⁾.

Factors that hinder the prevention and control of HCAI in NICU

Overcrowding in neonatal intensive care units is common throughout the country. This has a significant impact on HCAI, for it impairs the quality of the care provided to the newborn. This aspect was reported by some respondents, as it can be seen in the statements by E07 and E16:

Overcrowding [...], but we have to provide care to critically ill children, which is a very demanding situation.. When there is a complication we wash our hands, but do not use alcohol, or do not wear gloves. [...]. (E07)

[...] it is the overcrowding of patients; it is very difficult when there are too many babies. (E16)

Overcrowding in healthcare services is a nationwide problem that constitutes a major factor perceived by health professionals that makes it difficult to prevent and control HCAI. The statements made by respondents in our research are consistent with a study conducted with 12 members of a multidisciplinary team of a NICU in the city of Rio de Janeiro, in Brazil, where respondents also reported overcrowding as a major problem, with impact on the provision of care and humanized assistance⁽¹⁹⁾.

The NICU is a special place in the hospital setting, because the infants need special care and assistance. Moreover, complications are frequent in this unit, and were mentioned by the participants as one of the factors that hinder the prevention of HCAI in the NICU:

[...] sometime, during a complication, the baby needs urgent assistance and, despite your efforts, you will not be able to clean the ampoule with the customary calm that you have when you prepare a medication [...]. (E03)

[...] sometimes things are more difficult when you have many patients during a complication because you have to do everything very fast, and there is lack of time even to wash your hands [...]. (E11)

It is known that the nursing team must have technical skills, great expertise, and specific and updated knowledge to handle complications in a neonatal ICU⁽¹⁹⁾. However, these professionals often fail to disinfect their hands appropriately, or to use personal protective equipment as they should, which may lead to infections. Therefore, the complications, when improperly managed, may be a factor that contributes to increase the number of HCAI.

Another factor reported by the respondents was work overload associated to a decrease in the number of employees, and the excessive number of patients to be handled by each member of the nursing team, as it can be seen in the statements made by E06 and E17:

Lack of staff, too many patients, lack of information, work overload. (E06)

It is difficult when we have to take care of two infant: one in isolation, and the other not, and there is lack of people [...]. (E17)

The subject workload is discussed worldwide and is very important in the context of nursing care in NICU due to the emergence of new healthcare technologies, as well as the need of special care to critically ill patients and the need for skilled labor. A prospective cohort study involving 543 newborns, which addressed the relationship between workload and adverse events (EAs) related to mechanical ventilation in two NICU in Brazil, revealed an increasing rate

of events when the demand for nursing professionals and technicians was very high. With the number of newborns classified according to the demand for care (RCDCs) of 3.8 for nurse assistant, the rates of EAs of mechanical ventilation doubled, and with RCDCs of 4.8 the rates tripled. The authors demonstrated an association between workload of professionals and the rates of EAs, indicating causal link between workload and patient safety⁽²⁰⁾.

In this context, the dimensioning of the nursing staff in a NICU, besides improving the care provided to patients, contributes to the establishment of favorable working conditions, with a favorable impact on the health of the nursing staff. These professionals deal directly with stressful situations such as suffering and death, because the patients in the NICU are extremely debilitated, requiring intensive and constant care, unlike other hospital units.

Another factor mentioned by the respondents that hinders the prevention and control of HCAI in NICU is the use of ornaments, jewelry and cell phones, as they are means of transport of microorganisms for infants:

[...] many college students, especially of the medical school, come here. We don't even notice if they do the proper washing of hands; they use watches, which is not allowed here: watches, cell phones, rings are not allowed, only wedding rings; we see many medical students that do not observe these recommendations. (E04)

According to the ANVISA (National Agency for Sanitary Surveillance), before beginning any procedures with newborns, it is necessary to remove articles such as jewels, rings, wedding rings, bracelets and watches, for microorganisms can accumulate under such objects⁽¹²⁾. It can be seen, therefore, that health professionals have a great impact on the prevention and control of HCAI in NICU, because they have great influence on the care provided to newborns, with the purpose of improving their quality of life.

FINAL CONSIDERATIONS

The results of this study demonstrated that the nursing team is aware of the factors that facilitate and hinder the prevention and control of

HCAI in NICU. In this sense, this is an advance in the knowledge on the issue, for it allows the planning of specific strategies of permanent education, to be used in HCAI prevention.

Proper HH was mentioned by all the participants, and is currently the most effective and less expensive method for preventing and controlling HCAI. The excessive workload of the staff, the use of objects such as rings, watches, etc, the complications and the overcrowding of the units were mentioned as factors that hinder the prevention and control of HCAI, corroborating previous data in the literature.

It is believed that an efficient and skilled performance of the nursing staff is a strategy of prevention and control of HCAI, contributing to improve the quality of life of the newborn. It is worth stressing that all the members of the multidisciplinary team are responsible for preventing and controlling HCAI.

The limitations of this study are related to the fact that only employees of one hospital were interviewed. However, it is argued that such limitations do not affect the results, since this is a qualitative approach on the risk of infection in neonatal intensive care units, which is not intended to generalize the phenomena. However, further studies using different research methods and that involve different institutions are needed to the development of new nursing strategies for the prevention and control of infections in neonatal intensive care units.

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