



NOSOCOMIAL INFECTION CONTROL PRACTICES AMONG NURSING STAFF IN THE NEONATAL INTENSIVE CARE UNIT IN MULTISPECIALTY TEACHING HOSPITAL

Management

Nirmala Kumari*	Professor, Department of hospital administration, Father Muller College of Allied Health Sciences, Kankanady, Mangalore, Karnataka, 575002. India. *Corresponding Author
Keerthan Maria Pinto	Lecturer, Department of hospital administration, Father Muller College of Allied Health Sciences, Kankanady, Mangalore, Karnataka, 575002. India

ABSTRACT

This study examined the antiseptics, disinfectants and infection control measures in the Neonatal Intensive Care Unit. A descriptive study was designed wherein antiseptics and disinfectants used in the Neonatal Intensive Care Unit were known through informal interview with Incharge, use of disposable gloves and masks, employee health procedures and training for nursing staff with regard to infection control were assessed through a questionnaire administered to 26 nursing staff. Convenience sampling technique was used to collect data from the respondents. Statistical Package for Social Sciences was used for data analysis. Findings indicate that appropriate antiseptics and disinfectants were used in Neonatal Intensive Care Unit. Majority 19(73%) of the nurses used disposable gloves and masks and majority of the nursing staff underwent health procedures and training relevant to infection control.

KEYWORDS

Nosocomial Infections, Infection Control, Neonatal Intensive Care Unit, Antiseptics and Disinfectants

INTRODUCTION

The Neonatal Intensive Care Unit also referred to as NICU cares premature and sick infants in a specialized critical care setup. Healthcare Associated Infections (HAI) among infants hospitalized in the Neonatal Intensive Care Unit (NICU) is a significant cause for morbidity and mortality and results in substantial health care costs. Hence, it is a responsibility of healthcare providers to ensure an adequate arrangement to control the risk of infections. Also, infection control measures are to be viewed as a priority and have to be fully integrated into the continues process of improvement of quality care.

REVIEW OF LITERATURE

Healthcare Associated Infections (HCAI) is 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. (WHO, 2011) Nosocomial infection (NI), or Hospital-Acquired Infection or Health-Care-Associated Infection (HCAI) refers to infection that is acquired during the process of care and not manifested at the time of admission to a hospital or other health-care facility. (Nejad et al., 2011)

Newborns need special attention and care, because their skin is the main port of entry for these infections. (Adriano et al, 2009) 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. (Pinheiro et al., 2009) There is also evidence that these infections are a major cause of neonatal morbidity and mortality in developing countries. (Ganatra, Zaide, 2010)

Associated risk factors include low birth weight, indwelling central catheter, parenteral nutrition, prior antibiotic exposure, and invasive procedures. (Perlman et al, 2007) Other risk factors for Hospital-Acquired Infections include the presence of intravascular catheters, other invasive devices, mechanical ventilation, parenteral nutrition and use of broad-spectrum antibiotics. (Polin et al., 2012) Some bacteria may also constitute a major challenge due to high levels of antimicrobial resistance raising therapeutic concerns in case of late-onset sepsis. (Simões et al., 2016)

Thus, the nursing team of Neonatal Intensive Care Units must work together to detect possible failures in order to improve the quality of life of the newborn. (Montanholi LL, Merighi, 2011).

Nursing team must have technical skills, great expertise, and specific and updated knowledge to handle complications in a neonatal ICU. (Souza, Ferreira, 2010)

Chlorhexidine has wide antimicrobial activity, and topical longevity makes it suitable for skin disinfection before invasive procedures.

Iodine compounds are used in two iodophor forms: povidone-iodine and poloxamer-iodine. Iodines are rapidly bactericidal, fungicidal, tuberculocidal, virucidal, and sporicidal. (McDonnell, Russell, 1999) In Canada, 35% of Neonatal Intensive Care Units use povidone-iodine. (McCord, et al., 2019) and in New Zealand-Australia, 5.3% use povidone-iodine. (Taylor et al., 2014)

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. (Costa et al., 2011)

In view of these considerations, this study aimed to identify the antiseptics and disinfectants used in the Neonatal Intensive Care Unit and assess the infection control measures and health procedures and training for nursing staff Neonatal Intensive Care Unit staff in the selected hospital.

OBJECTIVES

- To know the antiseptics and disinfectants used in the Neonatal Intensive Care Unit in the selected multispecialty teaching hospital
- To assess the use of disposable gloves and masks by nursing staff in the Neonatal Intensive Care Unit in the selected multispecialty teaching hospital
- To assess the employee health procedures and training for nursing staff in the Neonatal Intensive Care Unit staff in the selected multispecialty teaching hospital

METHODOLOGY

A descriptive research was adopted to gather information from the nursing staff and the nursing Incharge in the Neonatal Intensive Care Unit. A sample size of 26 nursing staff were selected based on convenience sampling technique. Questionnaire method was used to collect data from the nursing staff on the use of disposable gloves and masks, employee health procedures and training for nursing staff. Informal interview with Incharge of Neonatal Intensive Care Unit was conducted to know the antiseptics and disinfectants used in the Neonatal Intensive Care Unit. The data was analyzed using Statistical Package for Social Sciences. Frequency and Percentage were calculated for the collected data. Data was presented in the form of tables.

RESULTS

This part consists of the tabulation of the data collected through questionnaire from 26 nursing staff and informal interview with Incharge in the Neonatal Intensive Care Unit.

Table 1: Disinfectants and antiseptics used in Neonatal Intensive Care Unit

DISINFECTANTS AND ANTISEPTICS	SURFACES ON WHICH ANTISEPTICS USED			
	SKIN PREPARATION OF PATIENT BEFORE ANY PROCEDURE	HAND RUB FOR STAFF	FLOOR SURFACE	DISINFECTION OF INFECTIOUS INSTRUMENTS
POVIDINE IODINE SOLUTION	YES	NA	NA	NA
CHLORHEXIDENE SOLUTION	NA	YES	NA	NA
SODIUM HYPOCHLORIDE	NA	NA	YES	NA
CIDEX SOLUTION	NA	NA	NA	YES

NA=Not Applicable.

Table 1 shows the disinfectants and antiseptics used in Neonatal Intensive Care Unit. Povidine iodine solution is used for preparation of the skin of patients before any procedure. Chlorhexidine solution is used for hand rub by the medical and nursing staff before and after attending the patients. Sodium hypo chloride solution is used to clean the surface of floors. Cidexsolution is used to disinfect infectious instruments as well as to maintain sterility.

Table 2: Use of disposable gloves and masks in the Neonatal Intensive Care Unit

n=26

Use of disposable gloves and masks	Frequency	Percentage
Yes	19	73%
No	7	27%
Total	26	100%

Table 2 shows that majority 19(73%) of the nurses used disposable gloves and masks and 7(27%) did not use disposable gloves and mask in the Neonatal Intensive Care Unit.

Table 3: Health procedures and training for nursing staff in the selected hospital

n=26

Employee health procedures	Yes		No	
	Frequency (n=26)	Percentage (%)	Frequency (n=26)	Percentage (%)
Formal training on hospital acquired infection control	24	92%	2	8%
Maintain infection rate register	25	96%	1	4%
Undergone periodic health checkup	50	100%	-	-
Undergone immunization relevant to work	50	100%	-	-

Table 3 shows that 92% of the nurses got formal training on Hospital Acquired Infection control, 96% maintained infection rate register in the NICU and 100% of the nurses had undergone periodic health checkup and immunization relevant to work.

DISCUSSION

This study examined the antiseptics, disinfectants and infection control measures in the Neonatal Intensive Care Unit. Findings indicate that appropriate antiseptics and disinfectants were used in Neonatal Intensive Care Unit. Majority 19(73%) of the nurses used disposable gloves and masks and majority of the nursing staff underwent health procedures and training relevant to infection control.

Compliance on the part of healthcare workers with standard precautions has been recognized as an efficient and effective means to prevent and control Health Care-Associated Infections in patients and health workers. (Garner, 1996)

Many infection control measures, such as appropriate hand hygiene and the correct application of basic precautions during invasive procedures are simple and of low-cost, but require staff accountability and behavioral change, in addition to improving staff education, reporting and surveillance systems (Bouallège, Naija, Said, Nouria, Jaidane, Dhidah, & Boujaafar, 2013)

In five studies, chlorhexidine (CHG) with different concentrations and combinations was used. In Canada, >85% of neonatal intensive care units use 2% CHG with 87% alcohol content and 2% pure CHG. (McCord H et al., 2019)

A descriptive study was conducted on nurses who worked at surgical wards in Azady Teaching Hospital in Kirkuk city to assess the practices of nurses towards standard precautions. The study revealed that the majority (91.9%) of the nurses did not get training sessions regarding infection control and (83.4%) of them had not participated continuous learning about infection control. According to the level of practices towards standard precautions, it has revealed that poor practices of standard precautions by surgical wards nurses had shown in surgical wards (Mahmud and Abdul Sahib, 2011).

Based on the study findings and above mentioned literature, interventional strategies for the prevention of Nosocomial Infections in NICUs needs to be developed. Control of infection is a major concern of all health workers and health policy makers. Nursing is crucial to the success of any preventive program aimed at reducing the incidence of infections in our health care facilities. Nurses therefore, must possess adequate knowledge and demonstrate practices towards achieving the goal of prevention of infections.

CONCLUSION

The morbidity and mortality of new born babies can be considerably reduced by implementing strict infection control strategies in NICU. The Nursing staff plays an important role in prevention of neonatal morbidity. The study analyzed the antiseptics, disinfectants and infection control measures in the Neonatal Intensive Care Unit. Results show that appropriate antiseptics and disinfectants were used. Majority of the nurses used disposable gloves and masks and underwent health procedures and training relevant to infection control. More Continuing Medical Education programmes are needed for the health care team to improve their competencies.

REFERENCES

- Adriano LSM, Freire ILS, Pinto JTJM. Cuidados intensivos com a pele do recém-nascido pré-termo. Rev Eletr Enferm [Internet]. 2009 [citado 2012 Nov 02];11(1):173-80.
- Bouallège O, Naija W, Said H, Nouria A, Jaidane N, Dhidah L, and Boujaafar N, (2013): Incidence of ICU acquired nosocomial infections in University Hospital of Sahloul (Sousse-Tunisia). Antimicrobial Resistance and Infection Control 2(Suppl 1):P233.
- Costa R, Padilha MI. Percepção da equipe de saúde sobre a família na UTI neonatal: resistência aos novos saberes. Rev Enferm UERJ. 2011;19(2):231-5.
- Ganatra HA, Zaide AKM. Neonatal infections in the developing world. Semin Perinatol. 2010;34(6):416-25.
- Garner, J. S. (1996). Guideline for isolation precautions in hospitals. The Hospital Infection Control Practices Advisory Committee. Infect Control Hosp Epidemiol, 17, 53-80.
- Mahmud N. and Abdul Sahib S. (2011) Assessment of Nurses' Practices Toward Infection Control Standardized Precautions in Azady Teaching Hospital in the City of Kirkuk. Iraqi National J. for Nursing Specialties; 24(1): 52- 58
- McCord H, Fieldhouse E, El-Naggar W. Current Practices of Antiseptic Use in Canadian Neonatal Intensive Care Units. Am J Perinatol 2019;36:141-7
- McDonnell G, Russell AD. Antiseptics and disinfectants: Activity, action, and resistance. Clin Microbiol Rev 1999;12:147-79.
- Montanholi LL, Merighi MAB, Jesus MCP. The role of the nurse in the neonatal intensive care unit: between the ideal, the real and the possible. Rev Latinoam Enferm. 2011;19(2):301-8.
- Nejad S.B., Allegranzi B., Syed S.B., Ellis B., Pittet D., (2011). Health-care-associated infection in Africa: a systematic review. Bulletin of the World Health Organization; 89:757-765.
- Perlman SE, Saiman L, Larson EL. Risk factors for late-onset health care-associated bloodstream infections in patients in neonatal intensive care units. Am J Infect Control. 2007;35:177-82.
- Pinheiro MSB, Nicoletti C, Boszczowski I, Puccini DMT, Ramos SRTS. Infecção hospitalar em unidade de terapia intensiva neonatal: há influência do local do nascimento. Rev Paul Pediatr. 2009;27(1):6-14.
- Polin RA, Denson S, Brady MT. Epidemiology and diagnosis of health care-associated infections in the NICU. Pediatrics. 2012;129:e1104-e1109
- Simões PM, Lemriss H, Dumont Y, Lemriss S, Rasigade J-P, Assant-Trouillet S, et al. Single-molecule sequencing (PacBio) of the *Staphylococcus capitis* NRCS-A clone reveals the basis of multidrug resistance and adaptation to the neonatal intensive care unit environment. Front Microbiol. 2016;7:1991.
- Souza KMO, Ferreira SD. Assistência humanizada em UTI neonatal: os sentidos e as limitações identificadas pelos profissionais de saúde. Ciênc Saúde Coletiva. 2010;15(2):471-80.
- Taylor JE, McDonald SJ, Tan K. A survey of central venous catheter practices in Australian and New Zealand tertiary neonatal units. Aust Crit Care 2014;27:36-42.
- World Health Organization (WHO). Report on the burden of endemic health care-associated infection worldwide - clean care is safer care. Geneva: WHO; 2011.