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A study on Infection Control Practises in Special Newborn Care Unit using Musqan tool.

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ABSTRACT

INTRODUCTION: Mortalities and morbidities due to Neonatal sepsis are rising in alarming numbers. The Ministryof Healthand Family welfare, India Launched "MusQan", aninitiative topromote thequality of paediatric public health facilities. The study was done to assess of Infection control practices in Special Newborn Care Unit (SNCU), Government District hospital of Karnataka, India

Materials and methods: A cross sectional study was conducted by using the MusQanassessment tool at District hospital during November 2022.

Results: The assessment using the tool showed the infection control practices in the hospital are poor and not adequate. The assessment showed the following results: Prevention and measurement of Hospital acquired infection (75%), hand hygiene (56%), personal protective practices (75%), processing of equipments and instruments (70%), environmental control and physical layout (68%), biomedical waste segregation, treatment and disposal (83%). Overall, the hospital scores 71% in infection control practices.

Conclusion: Neonatal sepsis is a major cause of neonatal mortality, especially in developing countries. Simple basic preventive measures like hand hygiene, adequate and regular disinfection of equipments, and use of personal protective equipments among healthcare personnel can reduce the incidence and prevalence of neonatal sepsis.

Key words: Special Newborn Care Unit (SNCU), MusQan

INTRODUCTION

Advancements in technology has a huge impact in health care settings. With the pacing growth in health care investments and technologies, there is increase in invasive procedures for both diagnostic and therapeutic purposes. These advancements are both advantages and disadvantageous to both patients and health care providers. The most horrific disadvantage among them being a Hospital Acquired Infection. The Center for Disease Control and Prevention (CDC) further extends the definition of Hospital acquired infections (HAIs) to

those infections acquired during the stay in the hospital, with a no evidence of infection manifesting at the time of admission into the health care setting.[1]The HAIs also include occupational infections among the healthcare professionals. HAIs are often caused by multi-resistant pathogens, with highest prevalence of cases seen in acute intensive care units, acute surgical conditions in most health settings. The extremities of age i.e., newborn and old age are most susceptible to infections because of their decreased resistance.

Newborn care is the need of the hour to reduce neonatal mortality. Neonatal sepsis, is one of the major cause of morbidity and mortality, especially in preterm newborns requiring prolonged care in Newborn Intensive Care Unit (NICU). The team consisting of hospital management, Pediatricians and hospital infection control committee play an important role in prevention of neonatal sepsis. Prevention of entry of microbes to NICU can be achieved by clean environment, hand hygiene and conducive infrastructure. Weekly and daily maintenance of equipments like incubators, warmers, syringe pumps, ventilator filters, circuits, bag and mask helps in curtailing the infections. Cord care, skin care and precautions during various procedures like venepuncture, endotracheal intubation and umbilical catheterization are important[2]. Hence, a regular, orderly setup is required on a continuous basis to establish a Newborn Unit with low rate of neonatal sepsis.

MusQan- Child Friendly services in public health facilities3

India has made significant progress in reducing child mortality. A series of national level initiatives launched by the Government of India under its flagship programmes, such as the National Rural Health Mission (2005), National Urban Health Mission (2013) and Ayushman Bharat (2018) have contributed to these improved indicators.

The quality maintenance of a health care system is a huge process and is a challenge. NQAS (National Quality Assurance Standards) as well as LaQshya have established institutional frameworks for the quality assurance in public health facilities. The quality assurance programme envisages to instill a culture of quality and safety in patient care. NQAS are currently available for District Hospitals, CHCs, PHCs and Urban PHCs. Standards are primarily meant for providers to assess their own quality for improvement through predefined standards and to bring up their facilities for certification (MoHFW, 2013).[4] The NQAS are broadly arranged under 8 "Areas of Concern"- Service Provision, Patient Rights, Inputs, Support Services, Clinical Care, Infection Control, Quality Management and Outcome. These standards are ISQua[5](International Society for Quality in Health Care) accredited and meets global benchmarks in terms of comprehensiveness, objectivity, evidence and firmness of development (MoHFW, 2013). Within the ambit of NQAS, a new activity called MusQan was launched to target good care and services to children attending to a healthcare facility. It targets to provide quality care in Pediatric Outpatient department (OPD), SNCU (Special Newborn Care Unit), Pediatric ward and NRC (Nutritional Rehabilitation Centre). The periodic assessments and certifications gives the staff more enthusiasm and encouragement to achieve high quality standards.

AIMS

To study the infection control practices in Special Newborn Care Unit (SNCU) in a District Hospital, Karnataka, India using MusQan Guidelines

MATERIALS AND METHODS

MusQan is a Quality Assurance programme conducted by Ministry of Health and Family Welfare to ensure good quality services across pediatric departments. The analysis was conducted in the

SNCU, Department of Pediatrics, District Hospital, Karnataka. The MusQan assessment tool is conducted in the hospital to assess the standards of healthcare practices in the Pediatric department i.e., hospital infrastructure, sanitation and hygiene, waste management, infection control, patient safety and support services.

The SNCU of District Hospital has 10 warmers with inpatient occupancy of 60% at all times. Newborns with mild to moderate respiratory distress, meconium aspiration, neonatal sepsis, neonatal jaundice, hypernatremic dehydration and various other conditions are provided care in the SNCU.

As a part of the National Initiative, MusQan is currently an ongoing program in the hospital. Before this study was undertaken, Pediatricians, medical officers, nursing officers, were given sensitization program organized by District Quality Assurance team and Department of Health and Family Welfare. Before the initiation of the study, prior permission was taken from concerned authorities. Consent from the District Surgeon, Nursing Superintendent, Nodal Officers of was obtained. The study was conducted in the month of November 2022.

The cross sectional study was conducted at the SNCU of District Hospital. The assessment methods used in this study were direct observation (OB), Staff Interview (SI), and Review of Records and Documents (RR). The scores were allotted as Fully Compliant (2), partially compliant (1) and non-compliant (0). The observations and documentation were conducted using a checklist provided under MusQan Certification Program.

RESULTS

MusQan assessment was conducted by the programme coordinator using the checklist. Paediatricians, Medical Officers and Staff nurses participated in the assessment. The assessment revealed the infection control practises to be at 71% , with an overall score of 79 and maximum score being 110. The results of assessment are described in the table below

Reference no	Criteria	Attained score	Maximum score
F1	Prevention and Measurement of HAI	9	12
F2	Hand hygiene	9	16
F3	Personal protective practices	9	12
F4	processing of equipments and instruments	17	24
F5	environmental control and physical layout	15	22
F6	Segregation, treatment and disposal of biomedical waste	20	24
	F1+F2+F3+F4+F5+F6	79	110

The facility had infection control programme, swabs were sent for microbiological swabs regularly, procedure to report cases of HAI, procedure for immunization and check-up of the staff. However, there were no regular infection control audits and not all staff practised gowning and hand washing before entering SNCU.

Though there were availability of hand wash facility and display of the steps of hand washing at the point of use. All staff did not follow all the 6 steps of hand washing and mothers were unaware of hand hygiene practises. There was good availability of Personal protective materials like gloves, aprons, caps and masks. But the staff did not follow right method of donning and doffing.

The staff were aware about the decontamination and disinfection procedures. They did not follow it all times. There were no proper handling of soiled and infected linen. Autoclaving of instruments was done as per protocol though most of the staff were not aware about the time, pressure and

temperature in the autoclave and autoclaved materials are not always stored in dry, clean, dust free environment.

There were no adequate separation between inborn and outborn units, no separation of routes for clean and dirty items. External foot wears were not allowed, entry was restricted. Unnecessary staff did not enter without any valid reason. Isolation were carried out for sepsis cases. Spill management protocols were implemented and displayed. There were availability of coded bins, chlorinated plastic colour coded bags for disposal of waste. Segregation was done appropriately and there were no mixing of waste. Needle cutters were not available. Transportation was done in a closed container. There was availability of post exposure prophylaxis after a needle stick injury.

The overall assessment ranked at 71 percentage. However, the huge deficit is in the practise of hand hygiene, which can largely becorrected and achievement of even better goal can be made sure. The facility was assessed once during the month of November, however practises may worsen or get better in the due course of time. Continuous motivation, appreciation of the staff and ensuring infection control practises on regular basis will reduce the neonatal sepsis rate in the newborn care units.

DISCUSSION

Strict rules and high investment infection control practises are possible in private health care facilities with high end infrastructure. However implementation of those would be difficult in a public health care facility. Through the inspirational approaches of Government of India, standardization of public health care facilities has also been made possible by implementation of NQAS, LaQshyaand MusQan. Javeed et al,[6] in his study noted that, there were several advantages to NQAs accreditation, such as public hospital are competitively similar to private hospitals and, having sense of pride and satisfaction among staffs. Thisindicates that the NQAS accreditation has the potential to be consolidated as a system for quality management in the public healthcare hospitals. Also study finding may be helpful for policy makers and hospital managers who are currently working to further strengthen the accreditation program and its implementation.

Industrialized countries have made progress in reducing newborn sepsis by establishing access to institutional delivery for all women, intrapartum antibiotic prophylaxis whenever required, and high-quality intensive care for newborns. Resource constraints in developing countries preclude adoption of these strategies, however there are a number of low-cost proven interventions and promising approaches that have the potential to significantly reduce the burden of neonatal sepsis worldwide.

The hands of mothers, other caregivers, and Health care workers harbour significant microbial pathogens acquired during contact with patients or environmental surfaces.[7]Contact of caregivers and health care worker hands with respiratory secretions, diaper change, and direct skin contacts are often associated with transmission of infections to the newborn. [8]Cross infections of newborns by healthcare professionals with contaminated hands is a major source of infection as well route for transmission of infections. Nursing officers failed to adhere to standard protocols of hand washing and hygiene, which is the single most important and universal method for infection control. Hand hygiene instructions, steps of Universal 6 step hand wash technique were displayed in work areas and staff were aware of when hand washing should be done. The facility scored 56%, which can largely be improved by regular training and hand hygiene audits. A similar facility scored hand hygiene 30% in their study using kayakalpa tool. [9]

Health professionals are always in contact with infections, while they are in contact with patients. Their protection indirectly prevents them from spreading to vulnerable newborns. Hence, use of

personal protective practises are of utmost importance. Most of the staff were partially compliant in using PPEs, especially in the method and wearing and removing. The facility scored 75% in use personal protective practices as compared to 70.3% in a study conducted during SARS outbreak in Singapore[10]and 70% in a study conducted at a district hospital using Kayakalpa assessment.[9]

Instruments and equipments have to be properly disinfected and cleaned to reduce contamination and prevent outbreaks of sepsis. The facility score is only 70% for processing of equipments and instruments. There was no proper handling of infected and soiled linen, most of the staff did not know to prepare chlorine solution and about storage of autoclaved items.

Layout of the Newborn care unit and environmental control of patient care areas ensures infection prevention. The facility scored 68%. Segregation, collection and treatment and disposal of biomedical waste is a huge concern for ICU setups. Appropriate protocols if followed can prevent huge mishaps. The facility scored 83% in biomedical waste management. There was no mixing of biomedical waste in the bins when assessed.

Outbreaks of sepsis in Newborn care units have been occurring in small and big scales throughout the year and has been a major headache for all the paediatricians throughout the world. Following appropriate protocols regularly prevents sepsis and ensures giving quality care to the sick newborns.

CONCLUSION

Infection control especially in the newborn care units are of high importance as they significantly improve neonatal care. Effective infection control is the key to provide high quality patient health care. It's a continuing concern for the public health managers and the hospital administration because it is unable to achieve adequate levels of prevention in our country especially in public health care sectors. Quality assurance standards like MusQan help us achieve these goals through a simple set of guidelines.

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