Rate of bacterial colonization in NICU staff

Thesis

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بسم الله الرحمن الرحيم
قالوا سبحانك لا علم لنا إلا ما
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Contents

List of Abbreviations

(CPs)	capsular polysaccharides
(CUTIs)	catheter urinary tract infections
(CLABSI)	central line associated blood stream infection
(CVC)	central venous catheter
(CDC'S NNIS)	Centre of Disease Control's National Nosocomial Infection Society
(CHG)	chlorhexidine
(CoNS)	Coagulase-negative Staphylococci
(HCAI)	common healthcare-associated infection
(CA)	community-associated
(CPAP)	continuous positive airway pressure
(CRP)	C-reactive protein
(GBS)	group B Streptococcus
(HAI)	heaalth-care associated infections.
(HRV)	heart rate variability
(HAP)	Hospital acquired pneumonia
(HIE),	hypoxic-ischemic encephalopathy
(IGA)	immunoglobulin A
(IL-1β)	interleukin-1beta

IAP	Intra-partum Antibiotic Prophylaxis
(IDD)	irritant diaper dermatitis
(MRSA)	Methicillin-Resistant Staphylococcus Aureus
MSCRAMM	Microbial surface components recognizing adhesive matrix molecules .
(NICHD)	National Institute of Child Health and Human Development
(NEC).	necrotizing enterocolitis
(NICU)	Neonatal Intensive Care Unit
(NI)	nosocomial infection
(ON)	Ophthalmia Neonatorum
(PICU)	paediatric intensive care units
(PDA).	patent ductus arteriosus
PBP	penicillin-binding protein
(PPE).	Personal protective equipments
(PROM)	premature rupture of membranes
(RDS)	respiratory distress syndrome
(ROP),	retinopathy of prematurity
(SSTI)	soft tissue infection
(SCCmec)	staphylococcal chromosomal cassette mec
(SSIs).	surgical site infections

(NSCS)	The Neonatal Skin Condition Score
(TPN)	Total parental nutrition
(TEWL).	trans-epidermal water loss
UTIs	urinary tract infection
(VAP)	ventilator associated pneumonia
(WHO)	World Health Organization

List of tables

List of tables (Cont.)

List of Figures

Introduction

Nosocomial infections are one of the most important causes of morbidity and mortality in hospitals particularly in developed countries. Nosocomial infected patients were defined (by US department of health and human services centers for diseases prevention and control) as all patients who neither infected nor were in incubation period at time of admission and had positive culture after third day of admission. Sophisticated and accelerated improvement in diagnostic and therapeutic methods have helped significant progress in clinical medicine but plentiful using of invasive technologies, severe and fatal nosocomial infections cause many damages every day**(Salamati et al,2006).**

The risk for nosocomial infections is (5-10) times higher in patients hospitalized in the neonatal intensive care unit than in patients staying in other wards. **(Jovanovic et al, 2006).**

The neonatal intensive care unit (NICU) nosocomial infection has increased over the last decade. The total number of neonates who develop nosocomial infection per admission varies from 6.2 to 33% or, when reported as total infections per 1000 patient days, the rate varies from 4.8 to 22. Blood stream infection (nosocomial infections) varies from 3 to 28% of admission. The variability in infection rates depend on the

gestational age, distribution of the infants surveyed for the report, and on the specific environment and care practice. While the confirmed nosocomial infection occur in approximately 30% of very low birth weight neonates, Antibiotic use (especially vancomycin) is much more common. This suggests the nosocomial infection is much more frequent occurrence than confirmed nosocomial infection. The real problem is that we have a very limited gold standard in diagnosing true sepsis , no lab test identify all patients that need to be treated and some degree of "over treatment" is unavoidable, even if risky, in terms of subsequent infections **(sastra et al,2004).**

Most authors describing neonatal infections find it convenient to use the term "early onset infection" and "late onset infection". Early onset infect ions are confined infections in the first 3 days of life, whereas late onset infection occurs after the third day. Nosocomial infections occur after the third day of life so its equivalent to late onset infection **(sastra et al, 2004).**

Methicillin Resistant Staphylococcus Aureaus (MRSA) is considered a nosocomial pathogen. However, MRSA infection, especially neonatal toxic shock syndrome, has become a large problem in neonate. There for, is important to inhibit MRSA spread, colonization & infection whithin neonatal intensive care units. Although many control measures

have been introduced, including hand washing, reducing overcrowding increasing nursing staff, and treating staff and carriers with Mupirocin. The spread of MRSA has not been stopped. An exponential increase in the isolation rate of MRSA is one of the most serious problems in NICU in Japan **(Adams et al, 2008).**

Aim of the Work:

The aim of this study is to investigate the rate of health care worker bacterial colonization in neonatal intensive care unit

Definition of nosocomail infection

Nosocomial infection is any infection that is result of treatment in a hospital or health care service units. Infection is considered to be nosocomial if it first appears 48 hours or more after hospital admission or within 30 days after discharge. This type of infection is known as hospital acquired infection or, in generic terms health care associated infection. In Europe where hospital surveys have been conducted the category of gram negative infections are estimated to account for 2/3 of the 250,000 deaths each year. Nosocomial infection causes severe pneumonia, urinary tract infections, blood stream infections and infections of other parts of the body **(Pollack and Andrew, 2010).**

The use of advanced medical technology such as the closed system of a central line and tracheal tube in the Neonatal Intensive Care Unit (NICU) has improved the quality and length of life of neonates born with prematurity and congenital defects. However, nosocomial infection risks are high in NICU babies due to their immature immune systems and the need for invasive diagnosis and treatment, causing high mortality and increasing the medical costs. NICU babies with higher immaturity must undergo more treatment, and need more invasive manoeuvres as central venous catheter

(CVC), intravenous line routes, tracheal intubation, and catheter indwelling in the bladder. These treatments can increase the incidence of infection especially because the skin and mucosa are immature **(Huang et al, 2005).**

In many developing countries, neonatal mortality rates (death in the first 28 days of life) are as high as 40–50 per 1000 live births, with infections being the major cause of death. Unfortunately, hospitals in developing countries are at high risk of infection transmission. Improvements in neonatal outcomes are subverted by hospital-acquired infection and their associated morbidity, mortality and cost **(Lawn et al, 2004).**

Epidemiology

Frequency:

In the United States, it was estimated that nosocomial infection occurs in 5% of all hospitalizations. In 1999, National Point Prevalence Surveys in paediatric intensive care units (PICU) and NICU showed that 11.9% of PICU patients and 11.4% of NICU patients had acquired nosocomial infection **(Coffin et al, 2008).**

The distribution of isolated pathogens related to nosocomial infection in Abha NICU showed that the most frequently isolated organisms were Coagulase-negative