

# The Impact of Enhancing and Boosting the Conviction and Commitment to the Infection Control Program by Increasing the Number of On-Duty Motivational Sessions in NICU and the Labor Room

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## ABSTRACT

**Introduction:** Nosocomial Infection is a formidable challenge to all health care institutions. Prevalence varies rarely with some of the reports showing it to range from 7-10%. Patients in Neonatal intensive care (NICU) and other high dependency areas are at more risk. Prevention of Nosocomial infections requires multidisciplinary approach with no shortcuts. Strict implementations of infection control practices remain unsatisfactory at various places. Aim of the study was to see the impact of enhancing and boosting the conviction and commitment to the program by increasing the number of on-duty motivational sessions in NICU and the labor room from where neonates are shifted to NICU SKIMS Medical College.

**Material and methods:** Infection control team increase the visits from 1 per 2 weeks to 2 per week and shifted the approach from pointing out the deficiencies to encouraging the NICU staff by on-duty counseling.

**Results:** The impact of intervention by increasing the visits to NICU and Labor room from 1/15 days to 4/15 was recorded. It was seen that the organism isolation rate gradually dropped over a period of 1 year. A significant decline was seen in Coagulase Negative Staphylococcus aureus (CONS), Methicillin resistant Staphylococcus aureus (MRSA) and Enterococcus spp.

**Conclusion:** The results show a definite positive impact of augmenting on-duty motivational programs for care giving staff to prevent the Nosocomial infection.

**Keywords:** Impact of Enhancing, Boosting, Conviction and Commitment, Infection Control, Motivational Sessions in NICU, Labor Room

NICU surfaces harbour a large number of bacterial and fungal taxa, including members associated with HAIs in neonates. Recent studies have investigated the hypothesis that colonies of pathogenic agents on the surfaces of NICUs may increase the risk of infection for premature infants, without showing a species-specific causal association between environmental contamination and neonatal infection.<sup>5,6</sup>

The frequency of infection in NICU varies from 6-25% in US, 8-10% in Europe.<sup>7</sup> In multi-centric trial in US shows an incidence of 6.3 episodes of Late onset sepsis (LOS) per 1000 NICU admissions.<sup>8</sup> Nosocomial infections increase morbidity, mortality, hospital stay and health care cost for the patient in addition to increase in drug resistance of the microbes.<sup>9</sup>

Prevention of Nosocomial infections requires multidisciplinary approach with no shortcuts.<sup>1</sup> A team of neonatologists, infection control nurse, hospital engineers, administrator, hospital infection control committee are required together to recommend measures to contain the hospital acquired infection.<sup>10</sup>

Hand hygiene is most important and critical step to control Nosocomial infections. Since 2005 WHO started slogan "clean care is safer care" program to promote hand hygiene. Despite protocols and recommendations compliance to hand hygiene is reported unsatisfactory. Emphasis is also laid on the behavior and motivation of care giving staff which influences the outcome of infection control program.<sup>11</sup> With this aim the study was designed to see the impact of enhancing and boosting the conviction and commitment to the program by increasing the number of on-duty motivational sessions in NICU and the labor room from where neonates are shifted to NICU.

## INTRODUCTION

Hospital acquired infections appear in the patient in the hospital while they are being treated for another diseases. Prevalence varies rarely with some of the reports showing it to range from 7-10%. Risk of contracting infection within the hospital also varies being more in areas like Intensive care units (ICU), Neonatal intensive care unit (NICU), Burn ward, organ transplant wards.<sup>1</sup>

In recent years, there has been a growing interest in the role of the contaminated hospital environment in the transmission of HAIs.<sup>1</sup> Contaminated surfaces act as a reservoir for many pathogens, including those from the patients themselves and can, therefore, be a substantial source for transmission of hospital infections.<sup>2,3,4</sup>

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## MATERIAL AND METHODS

SKIMS Medical college is a tertiary care hospital with NICU having 7 beds and labor room 13 beds the total patient load of 36000 admitted in 2019. NICU beds remain 100% occupied with most of the patient shifted from SKIMS MC Labor room. Routinely infection control team visits NICU and Labor room once in two weeks. The approach of the team used to be catching the care giving staff off-guard and pointing out deficiencies. From February 2019 approach of sudden inspection was changed to a twice a week planned visits with aim of motivation, encouragement, support and help the staff to organize and to adhere infection control practices in NICU and Labor room. The visiting team constituted of one consultant, one senior resident, one hospital infection control nurse. The following items/practices were keenly observed and ensured.

- A Availability of items: spirit swabs, soaps, hand scrub, disinfectant, gloves, needle destroyer, shoe cover.
- B Activities: Hand washing, needle precautions, contact precautions, mopping and cleaning of floor and other surfaces, compliance to the waste management protocols.

Environmental sampling was also done to know the local bacteriological profile of the ICU.

### Specimen collection

Samples were collected from surfaces of incubators, radiant warmers, suction tips, ventilators, stethoscopes, ambu bags, door handles, digital weighing machines, mothers' beds, phototherapy beds, laryngoscope, bedside locker, telephone sets, hood box, blood pressure machine, station counter, wall BPL monitor and sterilizer. Majority of these sites either come in direct contact with healthcare professionals or neonates. Samples were collected by rubbing sterile swabs moistened with peptone water.

### Isolation and identification of bacterial isolates

Samples were inoculated immediately in peptone water and incubated overnight. Sub cultures were performed on MacConkey agar and Blood agar plates. Plates were incubated aerobically at 37 °C for 24–48 h. Identification of the isolates was performed by standard microbiological techniques such as colony morphology, microscopic features and standard phenotypic characters.<sup>12</sup>

## RESULTS

Organisms isolated from patients in NICU from January 2019 to December 2019 were grouped into four. Each group belonged to one quarter of the year (3 months). The impact

of intervention by increasing the visits to NICU and Labor room from 1/15 days to 4/15 was recorded.

## DISCUSSION

Organisms causing Nosocomial infections are often present on surfaces around the patients. The most likely vectors that transmit the infection from inanimate environment to the patients or hospital staff and other patients. In a study done by Sanjay et al they saw the above average isolation rate of *Staphylococcus aureus* matched with the monthly growth of similar organism in the surveillance report. Correlating organisms from the healthcare associated infection to the environmental surveillance may not show cause-effect relationship. Environmental cultures may be one of the predicting causative factors contributing to late onset sepsis but its statistical significance is yet to be proven.<sup>13</sup>

Infection in NICU can be classified into early onset infection and late onset infection with early onset taking place before 72 hours. Late onset infections originate from the environment and bacteria involved are *Klebsiella pneumoniae*, *E-coli*, *Staphylococcus aureus*, CoNS, MRSA, *Enterococcus*.<sup>7,8</sup> Spread of infection from patients, staff, environment, equipment etc. to the at risk patients is contained by comprehensive program which operates synergistically is shown as under.<sup>1</sup>

- A Standard Precautions. Hand hygiene, Respiratory hygiene, personal protective equipment, Injection safety, medication storage and handling, Cleaning and disinfection (devices and environmental surfaces) - waste management.
- B Transmission Precautions. Contact precautions, Droplet precautions, Airborne precautions.
- C Training of Healthcare staff
- D Immunization
- E Surveillance of Nosocomial infections

“Proposal Bundle” a set of evidence based process that when instituted as group improves the outcome. (ref 7)

Behavior and the commitment needs to be evaluated and augmented in view of the inappropriate of the nurse to patient ratio in developing countries.

In this work attempt is made to access impact of augmenting the motivation and commitment of the care giving staff by

- A Increasing infection control team visits from 1 per 2 weeks to 2 per week and
- B Making the visit one of the motivational and encouraging helping session for the care giving staff rather than pointing out negligence's grilling and questioning.

The results showed that with the change in approach that

Bacteria isolated	1 <sup>st</sup> January - 31 <sup>st</sup> March	1 <sup>st</sup> April - 30 <sup>th</sup> June	1 <sup>st</sup> July – 30 <sup>th</sup> September	1 <sup>st</sup> October – 31 <sup>st</sup> December
Coagulase negative staphylococcus (CoNS)	15 (100%)	6 (40%)	6 (40%)	4 (27%)
Methicillin resistant <i>Staphylococcus aureus</i> (MRSA)	11 (100%)	7 (64%)	5 (45%)	2 (18%)
<i>Enterococcus</i> spp	9 (100%)	3 (34%)	—	1 (11%)
<i>Escherichia coli</i>	2 (100%)	2 (100%)	1 (50%)	—
<i>Klebsiella pneumoniae</i>	7 (100%)	16 (228%)	1 (14%)	—
<i>Acinetobacter baumannii</i>	1 (100%)	1 (100%)	—	—

CoNS, MRSA fell to 40% each in 2<sup>nd</sup> quarter, 26% and 64% in 3<sup>rd</sup> quarter, 45% and 18% respectively in 4<sup>th</sup> quarters of the year. Similarly Enterococcus also showed decreasing trend with 33% and 11% in 2<sup>nd</sup> and 4<sup>th</sup> quarter. In a study done by Lesho E et al they observed that cleaned surfaces were less likely to have cultivable target microorganisms than pre-cleaned surfaces, they were not less likely to harbor bacterial DNA and environmental levels of cultivable Enterococcus spp. and E. coli DNA were positively correlated with infection incidences.<sup>14</sup> In another study done by Clifford R et al they observed that after the intervention, the number of rooms testing positive for specific pathogenic species by culturing decreased from 55.6% to 36.6% (not significant), and those testing positive by PCR fell from 80.6% to 53.7% (P = 0.016).<sup>15</sup> No comments could be made on E.coli and acinetobacter because of small number of episodes. Klebsiella showed a sudden flare-up in 2<sup>nd</sup> quarter which was attributed to local outbreak of Klebsiella in NICU in the month of May.

## CONCLUSION

The results show a definite positive impact of augmenting on-duty motivational programs for care giving staff to prevent the Nosocomial infection. Increase in number of visits 2 per week from 1 per 2 weeks and boosting the emotional coefficient and commitment by continual and friendly approach remains better than critical punitive approach hence more efforts need to be dedicated to motivation and on duty encouragement to prevent the hospital infections.

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