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ORIGINAL ARTICLE

Outbreak of *MRSA* in the Neonatal Intensive Care Unit of a Tertiary Care Hospital – Transmission from Nursing Personnel

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ABSTRACT

Objective: To investigate an outbreak of methicillin- resistant *Staphylococcus aureus* (MRSA) in the neonatal intensive care unit (NICU) of a tertiary care hospital.
Setting: Level III NICU in a tertiary care centre.
Cases: Four neonates in the NICU were identified to have MRSA infections. The hospital surveillance services identified four more additional neonates who were colonized with MRSA.
Source: Two nursing personnel were traced to be nasal MRSA carriers.
Interventions: Strict adherence to infection control practices along with initiation of mupirocin therapy. Surveillance cultures performed at regular intervals.
Conclusion: Stringent infection control regulations help to prevent and control MRSA outbreaks.

Key Words: MRSA, NICU, surveillance.

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The colonization and infection with methicillin-resistant *Staphylococcus aureus* (MRSA) is an increasingly recognized problem in NICUs. Several outbreaks of infections caused by MRSA in the NICU setting have been documented [1],[2],[3],[4]. Continuing surveillance efforts such as the National Nosocomial Infection Surveillance System and the European Antimicrobial Resistance Surveillance System have shown the global increase in MRSA infections worldwide [5]. In addition to Nosocomial MRSA, since 1998, outbreaks due to highly virulent, community acquired MRSA have been reported [6]. In our NICU, four neonates were identified during routine cultures to have MRSA infections and a point prevalence study identified four other neonates as being colonized with MRSA. Among these, one neonate succumbed to sepsis. Screening for *S. aureus* carriers was performed by nasal and umbilical sampling of all hospitalized neonates and by the nasal sampling of all the healthcare personnel. The cultures were processed and *Staphylococcus aureus* was then identified by conventional methods. Oxacillin resistance was determined according to CLSI guidelines [7].

Interventions

After initial surveillance, all case-patients were isolated and cohorted, health personnel were retrained in cleaning and disinfection procedures and hand hygiene and contact precautions were introduced in the NICU. The surveillance cultures of noncolonized neonates and newly admitted patients were done. All neonates were bathed with diluted (1:10) chlorhexidine gluconate (4%) once daily for 3 consecutive days. Nasal

mupirocin was implemented 3 times per day for 5 consecutive days for all carriers. These regimens were well tolerated, with no adverse events.

Three weeks after the first surveillance and intervention, a second surveillance was conducted in the NICU. Of the 7 neonates affected, only 5 were still hospitalized. Two of the neonates got discharged against advice. Of the 5, 3 neonates continued to carry the outbreak strain, and 2 were successfully decolonized. The 3 neonates were decolonized after a second course of a similar regimen. The 2 colonized nurses were sampled twice, 1 week apart, and were found to be persistent carriers of the outbreak strain. They were instructed about good hand hygiene practices, and nasal mupirocin was recommended for 5 days. One nurse cleared her nasal MRSA after mupirocin treatment and acquired a new strain of MSSA 2 weeks later. The other refused mupirocin treatment and persistently carried the outbreak strain for 2 weeks, during which period, she was forbidden from certain duties which required close contact with the neonates. She was counseled and was then decolonized successfully after treatment with nasal mupirocin. During a 6-month follow-up, no new cases of MRSA were identified.

Discussion

MRSA outbreaks in NICUs have been reported to be difficult to contain [8],[9],[10]. Only implementation of aggressive infection control measures, frequently combined with mupirocin treatment, has been successful in controlling such outbreaks. The outbreak described here was similarly contained by implementing a multifaceted infection control intervention. Since all the measures were undertaken simultaneously, it was difficult to define which of the measures were the most important.

Conclusion

The susceptibility of newborns, coupled with insufficient infection control measures and inadequate nurse-to-patient ratio may have contributed to this outbreak. It is essential to perform regular surveillance cultures and implement a strict infection control program. The onus of preventing and controlling outbreaks falls on all health personnel involved.

This study highlights the importance of having an efficient infection control program and health education for all the health personnel.

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Conflict of Interest

None.

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