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Successful eradication of 4 years of endemic MRSA following extensive neonatal intensive care unit refurbishment

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Background: Nosocomially acquired methicillin-resistant *Staphylococcus aureus* (MRSA) is a significant cause of morbidity and mortality in the neonatal intensive care unit (NICU). Current national guidelines recommend active surveillance in the NICU by screening all infants for MRSA carriage on admission to NICU and weekly thereafter, with isolation and decolonisation of affected infants. Following a 4-year period of endemic MRSA despite multiple attempts with standard infection control interventions, an endemic strain MRSA was finally eradicated from a tertiary unit NICU following complete unit refurbishment.

Method: Surveillance, colonisation and infection data for a 4-year period pre and 3-year period post NICU refurbishment are described. Clinical and microbiological data were collected on all MRSA colonised and infected infants between 2008 and 2014. Microbiological and molecular typing data are available for all MRSA isolates. All eradication strategies are described.

Results: During the 4-year pre-refurbishment period, following routine surveillance, 68 infants were documented to be colonised with MRSA. Almost all strains were from epidemic MRSA 15 clone, EMRSA-15 (Sequence Type 22 *Staphylococcal* Cassette Chromosome *mec* IV). Standard infection control eradication strategies including isolation, decontamination, staff education and staff screening failed to impact on colonisation rates. During the 3-year period since complete refurbishment and redesign of the NICU, there have been only 8 cases of MRSA colonised infants in the NICU. Four were already colonised on admission to NICU and clearly not NICU acquired; cross-transmission from one of these cases to one other infant occurred. There were three further, temporally unrelated, sporadic cases of MRSA colonisation. All of the post-refurbishment MRSA isolates were distinct from the previous endemic NICU strain based on *Staphylococcal* Protein A (*spa*) typing and pulsed-field gel electrophoresis (PFGE).

Conclusion: Infrastructure and overcrowding in the NICU contributed significantly to the failure to eradicate endemic MRSA in this setting. Successful eradication was ultimately achieved through complete unit refurbishment.

Biography

Aisling Semple graduated from medicine in the National University of Ireland Galway in 2012. She is specialising in paediatrics and has recently achieved membership to the Royal College of Paediatricians in Ireland. She has a special interest in MRSA in the neonatal population and has presented and published, both nationally and internationally on the topic.

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