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Paper Poster Session III

MRSA - still there and threatening

Utilization of staphylococcal interspersed repeat unit (SIRU) typing in neonatal infection control management

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Objectives

Transmission of nosocomial pathogens in critical care settings results in significant morbidity and mortality. We employed rapid Staphylococcal Interspersed Repeat Unit (SIRU) typing methodology to investigate clusters of *Staphylococcus aureus* infections in our neonatal intensive care unit (NICU) and thus prevent transmission.

Methods

Isolates of *Staphylococcus aureus* were collected as part of routine surveillance on the NICU. A single colony taken from overnight cultures was identified by MALDI-TOF MS. Staphylococcal interspersed repeat unit (SIRU) typing was performed by utilising 7 variable number tandem repeat (VNTR) regions, amplified to determine the number of repeats present at each locus within 2 days. Isolates were considered unique if they differed in repeat number at any of the seven loci. Each of the neonates with a *Staphylococcus aureus* isolate recovered from a clinical sample was discussed in a multidisciplinary infection meeting.

Results

A total of 8 clinical samples were analysed as part of an investigation into a period of increasing incidence of *Staphylococcus aureus* infection. In cohort 1, isolation of MRSA from neonatal secretions from patient 1 and an MRSA positive screening swab from patient 2 were typed and found not to be related. Patient 3 was a staff member with a positive screen and a different SIRU type, thus transmission was not demonstrated. In cohort 2, three patients were confirmed the same SIRU type on screening, indicating a transmission event. All patients in the unit were decolonised with mupirocin and chlorhexidine, no further transmission occurring. In cohort 3, two SAB blood culture isolated were related by SIRU typing. Subsequent investigation into the root cause identified a breakdown in line insertion practices.

Patient	Cohort	Source	Date	Organism	SIRU
1	1	Secretion	06/05/2012	MRSA	1 6 2 2 15 5 2
2	1	Nose	25/05/2012	MRSA	3 3 5 - 12 4 2
3	1	Skin	08/06/2012	MRSA	1 4 0 3 17 - 12
4	2	Nose	19/06/2012	MRSA	3 3 7 3 12 4 2
5	2	Nose	19/06/2012	MRSA	3 3 7 3 12 4 2
6	2	Nose	19/06/2012	MRSA	3 3 7 3 12 4 2
7	3	Blood	22/03/2014	MSSA	X 3 3 3 11 - 3
8	3	Blood	26/03/2014	MSSA	X 3 3 3 11 - 3

Conclusions

Molecular typing can be used to determine person-to-person strain transmission in clinical settings, which is important to develop strategies to prevent further spread. SIRU typing is inexpensive, highly reproducible, easy to perform, interpret and can be done around the suspected incident to confirm an outbreak and immediately inform control measures.