

943. Prospective evaluation of a cluster of *Pseudomonas aeruginosa* isolates identified by automated statistical software

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Background. Traditionally, nosocomial outbreaks are identified by reports from healthcare workers or review of microbiologic data. While these methods uncover the most egregious instances of nosocomial transmission, they are ultimately crude and insensitive. To improve upon the current state of outbreak detection we implemented a system which combines automated surveillance, epidemiological investigation and strain typing. In the present work, we report our initial experience with

prospective assessment of a cluster of an important nosocomial pathogen identified by automated surveillance.

Methods. The WHONET-SaTScan cluster detection tool was used to identify clusters of *Pseudomonas aeruginosa* in clinical cultures between January 2013-February 2014. Simulated, prospective surveillance using the space-time permutation model was used to detect temporal clusters of unique isolates by patient on the same hospital unit with a maximum cluster length of 60 days. A cut-off value of $p=0.05$ was used to identify clusters compared to a 1-year baseline incidence. Two evaluators independently assessed each cluster by analyzing records of patient movements and the antibiogram of the isolates. Isolates from a plausible cluster were analyzed by multi-locus sequence typing (MLST).

Results. Epidemiological investigation indicated that nosocomial transmission was unlikely in 20 of 21 clusters identified by automated statistical surveillance. One epidemiologically plausible cluster of three isolates was not identified by routine surveillance. Genotyping of this cluster and control isolates from the same unit and a second unit showed a different sequence type for each isolate tested.

Conclusion. Prospective use of automated statistical surveillance identified clusters of potential transmission missed by standard approaches, and the application of investigative tools including strain typing ruled out recent transmission in an otherwise plausible cluster. This methodology is practical and may allow focused use of infection control measures targeted at interrupting transmission.

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