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Incidence rates of hospital-acquired urinary tract and bloodstream infections generated by automated compilation of electronically available healthcare dataJ.D. Redder^{a,b,*}, R.A. Leth^c, J.K. Møller^{a,b}^a*Department of Clinical Microbiology, Lillebaelt Hospital, Vejle, Denmark*^b*Institute of Regional Health Research, University of Southern Denmark, Odense, Denmark*^c*Department of Clinical Microbiology, Aarhus University Hospital, Denmark*

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SUMMARY

Background: Monitoring of hospital-acquired infection (HAI) by automated compilation of registry data may address the disadvantages of laborious, costly and potentially subjective and often random sampling of data by manual surveillance.

Aim: To evaluate a system for automated monitoring of hospital-acquired urinary tract (HA-UTI) and bloodstream infection (HA-BSI) and to report incidence rates over a five-year period in a Danish hospital trust.

Methods: Based primarily on electronically available data relating to microbiology results and antibiotic prescriptions, the automated monitoring of HA-UTI and HA-BSI was validated against data from six previous point-prevalence surveys (PPS) from 2010 to 2013 and data from a manual assessment (HA-UTI only) of one department of internal medicine in January 2010. Incidence rates (infections per 1000 bed-days) from 2010 to 2014 were calculated.

Findings: Compared with the PPSs, the automated monitoring showed a sensitivity of 88% in detecting UTI in general, 78% in detecting HA-UTI, and 100% in detecting BSI in general. The monthly incidence rates varied between 4.14 and 6.61 per 1000 bed-days for HA-UTI and between 0.09 and 1.25 per 1000 bed-days for HA-BSI.

Conclusion: Replacing PPSs with automated monitoring of HAIs may provide better and more objective data and constitute a promising foundation for individual patient risk analyses and epidemiological studies. Automated monitoring may be universally applicable in hospitals with electronic databases comprising microbiological findings, admission data, and antibiotic prescriptions.

Keywords:

Bloodstream infection

Computer algorithm

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