

Can we bridge the definition diversity in healthcare-associated infection surveillance? From IT-supported surveillance to IT-supported infection prevention and control

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Abstract

Expectations and requirements of the surveillance of healthcare-associated infections (HAIs) trigger a growing differentiation of HAI surveillance approaches. In an attempt to bridge this diversity of definitions and to serve the needs of different user groups, we have enhanced MONI (identification, monitoring, and reporting of nosocomial infections) not only to create better reports, but also to output overviews on complex clinical matters, as well as to generate alerts and reminders for the clinicians' bedside work.

Keywords:

Healthcare-associated infections, infection control, surveillance, clinical decision support.

Introduction

Intelligent information technology (IT) became a meaningful tool in HAI surveillance. As could be shown before [1-3], the MONI surveillance tools not only yield high sensitivity and high specificity in identifying patients suffering from HAIs in intensive care, but also reduce human expert time spent collecting relevant clinical, laboratory, and administrative surveillance data. While hospital administration responsible for quality management and benchmarking rely on HAI surveillance reports based on internationally agreed HAI definitions, clinicians complain about increasingly being "misused" for documentation tasks that are of no direct benefit to their bedside work and thus to their patients. What they ask for are appropriate infection criteria applicable for bedside use and clinical decision support (CDS). These should be clinically meaningful and reflect recent clinical knowledge, with their results being available as overviews and alerts in real time. By fulfilling these requirements, MONI is expanding its scope from mere surveillance towards patient-oriented CDS.

Methods

MONI is installed at the Vienna General Hospital, Austria, a 2,100 bed tertiary and teaching hospital, serving for 14 intensive care units (87 beds for adults, 51 beds for neonates). Structured medical and denominator data are downloaded daily into the MONI system. Processing algorithms evaluate, aggregate, and interpret medical data step-by-step, computing all necessary clinical concepts until data can be mapped into the given "classic" HAI definitions. In addition to these defini-

tions, the new MONI processes so called "alert criteria" that have been specially designed according to clinicians' demands. The technical basis of MONI is an Arden Syntax server including an Arden-Syntax-based rule engine [4] and a carefully developed medical knowledge base.

Results

Now, MONI provides the infection control department with periodic HAI surveillance reports and clinicians with real time overviews and alerts on infection-related entities. In general, the alert criteria are wider and refer to clinical observations in the incoming data more strongly than the "classic" criteria. The aim of these alert criteria is mainly to sharpen the perception of imminent infection, borderline cases, or of changing infectious conditions over time. With our work, we attempt to establish intelligent IT tools that can equally serve the wishes of epidemiologists and clinicians, thus supporting co-evolution and mutual understanding of both sides.

References

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