O194
2-hour Oral Session
Healthcare-associated infections - from analysis to interventions

EVALUATION OF AN ALGORITHM FOR ELECTRONIC SURVEILLANCE OF HOSPITAL ACQUIRED INFECTIONS YIELDING SERIAL WEEKLY POINT-PREVALENCE SCORES

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Objectives

Insight in the epidemiology of hospital-acquired infections (HAI) is a prerequisite for infection control. Surveillance based on frequently performed point-prevalence surveys would be a way to be maximally informed. To reduce time spent we developed an electronic surveillance method. It is based on a selection algorithm that automatically differentiates between patients with and patients without high probability of having a HAI followed by detailed review of the patients with a high probability of HAI.

Methods

For each patient (n=5,797) included in ten consecutive point-prevalence surveys all predictive parameters present from admission date to point-prevalence date were automatically gathered and stored in a database. Then each patient was automatically evaluated (marked HAI positive or HAI negative) based on the selection algorithm. The ten consecutive hospital-wide surveys were performed each March and October from 2008-2012. Consistency of the algorithm was analyzed using an exact likelihood ratio Chi-square test.

Results

Overall HAI prevalence was 8,1 HAI per 100 patients. Based on the selection algorithm 4,026 (69%) of the 5,797 patients were automatically marked as HAI negative. In the remaining 31% of the population 91% (429/471) of all types HAI, including 91% (120/132) of the SSI, 92% (103/112) of the BSI, 92% (102/111) of the LRTI, 86% (42/49) of the UTI were found. The performance of the algorithm was consistent, i.e. no significant trend indicated (figure 1).

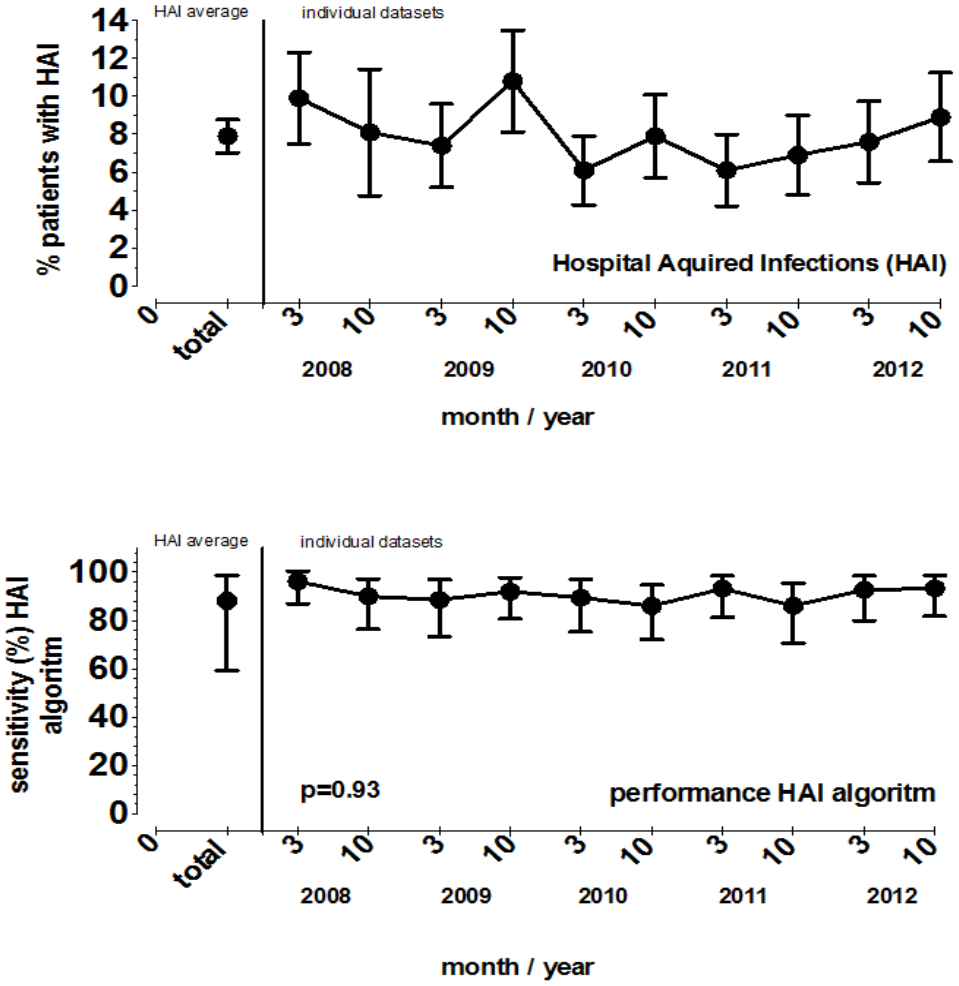

Figure 1. Point-prevalence of HAI for each survey performed in a period of 5 years and the sensitivity of the algorithm to detect HAI.

Similar consistent results have been observed with SSI, BSI, LRTI and UTI separately.
Conclusions

An electronic surveillance method based on our selection algorithm is a sensitive and reproducible way to automatically exclude the large majority of the patients from detailed assessment by the ICP. Among the automatically preselected patients >90 percent of all HAI can be found. The predictors used by the algorithm are digitally available in most hospitals, thus gathering them and executing the algorithm can be fully automated. Time needed for the detailed reviewing of the selected patients' clinical and laboratory data is significantly reduced since all these data have already been gathered. Consequently, this electronic surveillance system allows for frequent serial surveys for HAI's, thereby significantly improving the value and robustness of HAI surveillance. Future near-real time automated feedback of the results of this type of surveillance to the medical and managerial staff may impact on the quality of routine clinical practice.