Development and validation of a computer-assisted post-surgery follow-up system to determine incidence rates for surgical site infections in selected surgical procedures in a 565-bed teaching hospital.

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Introduction & Objective

Accurate surveillance data on hospital-acquired infections, timely analysis and prompt feedback to those who can take action is of utmost importance for infection control. In the Netherlands there is an increasing demand for reporting data on surgical site infections (SSI). Determining the incidence rate of SSI through manual review by trained personnel is labour-intensive.

We aimed to develop and validate a computer-assisted system to assist in the determination of SSI incidence rates, for selected types of surgery, more efficiently.

Methods

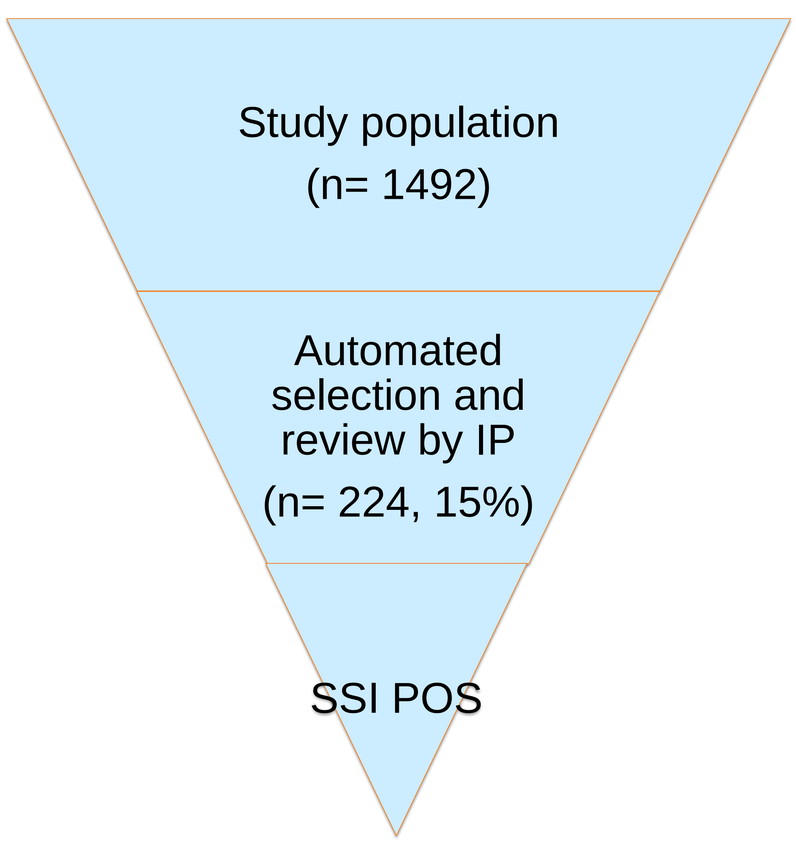

Figure 1. Workflow proposed surveillance method

An automated algorithm, that uses a selection of electronically available parameters (see table 1), selects patients for review by the infection preventionist (IP) to assess the presence of a SSI. The algorithm was developed using the incidence results from the year 2014 as the reference standard.

We retrospectively validated the algorithm and method using the incidence data of the year 2015.

Variables included (points added to the score)

- CRP measurement (1 pnt)
- CRP meting >48 (1 pnt)
- Leukocyte count (1pnt)
- Leukocyte count < 4 or > 12 (1 pnt)
- Microbiological examination (5 pnt)
- Antibiotic prescription (5 pnt)
- Specific samples for culture, e.g. wound or pus (10 pnt)

Total of points = score

Table 1. Variables used in calculating the infection score for the 90 day post-operative period

Results

For the validation we retrospectively included 1472 surgical procedures from three surgical disciplines; orthopaedics, vascular and abdominal surgery. Automatically 85% of the patients were excluded from review. 227 patients were selected for review based on the automated algorithm. Sensitivity of the computer-assisted incidence survey compared with the reference standard in 2015 was 87% (20/23) and 100% (16/16) for superficial and deep SSI, respectively.

Conclusions

We developed and validated a sensitive, time-saving method to determine SSI incidence rates for selected surgical procedures.