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ORIGINAL ARTICLE

Impact of a surgical site infection (SSI) surveillance program in orthopedics and traumatology☆

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Surgical site infection;
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Summary Surveillance of surgical site infections (SSI) is a priority. One of the fundamental principles for the surveillance of SSI is based on receiving effective field feedback (retro-information). The aim of this study was to report the results of a program of SSI surveillance and validate the hypothesis that there is a correlation between creating a SSI surveillance program and a reduction in SSI.

Materials and methods: The protocol was based on the weekly collection of surveillance data obtained directly from the different information systems in different departments. A delay of 3 months was established before extraction and analysis of data and information from the surgical teams. The NNIS index (National Nosocomial Infections Surveillance System) developed by the American surveillance system and the reduction of length of hospital stay index *Journées d'hospitalisation évitées* (JHE).

Results: Since the end of 2009, 7156 surgical procedures were evaluated (rate of inclusion 97.3%), and 84 SSI were registered with a significant decrease over time from 1.86% to 0.66%. A total of 418 days of hospitalization have been saved since the beginning of the surveillance system.

☆ This study was presented at the 86th SOFCOT meeting in Paris, November 2011.

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Discussion: Our surveillance system has three strong points: follow-up is continuous, specifically adapted to orthopedic traumatology and nearly exhaustive. The extraction of data directly from hospital information systems effectively improves the collection of data on surgical procedures. The implementation of a SSI surveillance protocol reduces SSI.
Level of evidence: Level III. Prospective study.

Introduction

Surveillance of surgical site infections (SSI) is a national priority (section L.711-1 of France's Public Health Code) for the fight against nosocomial infections (NI). These complications can have serious consequences on morbidity and mortality while also increasing costs. Based on the studies by Condon et al. [1] and Haley et al. [2], one of the fundamental principles for the surveillance of SSI involves receiving effective feedback (retro-information) when infections develop, in particular SSI.

The aim of this study was to review the structural bases of SSI surveillance and report the experience at the Dupuytren University Hospital Center (CHU Dupuytren) which began a SSI surveillance program in 2002 managed by the Hospital Hygiene Unit, and to validate the hypothesis that there is a correlation between creating a SSI surveillance program and a reduction in SSI.

Materials and methods

A ''register of nosocomial infections'' was created in accordance with a ministerial decree dated 6th February, 2006. The goal was to encourage all healthcare establishments to measure their actions and results in the fight against nosocomial infections, which are now called healthcare associated infections because transmission can occur outside the hospital setting [3]. Assessment indicators had to be defined for this approach: the first was ''the global indicator of activities in the fight against nosocomial infections'' (French acronym: ICALIN); followed by ''the indicator for the volume of hydroalcoholic products consumed'' (French acronym: ICSHA), then the ''indicator for SSI surveillance'' (French acronym: SURVISO, Fig. 1) which is a reference to determine the implementation of activities and not results, and finally the ''global index of the correct use of antibiotics'' (French acronym: ICATB).

To facilitate analysis of this register based on these four indicators, a ''total score'' of 100 was created. The relative weight of each indicator was established as follows: ICALIN 40%; ICSHA 30%; ICATB 20%; SURVISO 10%. The healthcare facility is classified (from A to E) depending upon the result of this total score, and can be compared to other facilities in its category.

The methodology used for the surveillance of SSI at the CHU Dupuytren was based on that proposed by the Network for the Warning, Investigation and Surveillance of Nosocomial Infections (*Réseau d'alerte, d'investigation et de surveillance des infections nosocomiales* [RAISIN]) which compiles data from interregional surveillance networks (CCLIN) [4]. This approach, which was initiated and managed by the Hospital Hygiene Unit (*Unité d'hygiène hospitalière* [UHH]) received the support of all the surgical teams: in 2002, it was first implemented in several ''pilot'' programs and it has been operational in the department of orthopedics and traumatology for more than 2 years [5].

The protocol is based on the weekly collection of surveillance data by the UHH, (age, gender, entry/release date, CCAM code, class, ASA score, duration of surgery, urgency, multiple procedure, biological samples, germ, antibiogram) obtained directly from the different information systems in our hospital (administration, operating room, bacteriological laboratory). At first, data was collected 3 weeks after surgery, because according to RAISIN data three out of four infections are identified within 15 days after surgery. However, this delay is 3 months for orthopedics-traumatology which corresponds to the mean postoperative follow-up evaluation date (in particular for planned surgery). Thus, each surgeon received the list of surgical procedures he/she had performed 3 months before for validation: this list included any existing microbiological data related to SSI for information purposes. Data were then exploited using EpiInfo® (version 6.04dfr) software. Every semester global results were sent to all surgeons and the specific results for each unit were only sent to the surgeons from that unit; a surgeon could obtain an individual report of his/her operations upon request (or they could be obtained for the purposes of the study).

The data in the surgical file could be applied to each specialization. For the SOFCOT symposium, we integrated the traumatology codes so that these SSI could be extracted from the global activity. We also integrated the National Nosocomial Infections Surveillance System (NNIS) index developed by the American surveillance system [6,7] and the reduction in hospital days index *Journées d'hospitalisation évitées* (JHE) [5].

The NNIS index is an indicator of severity based on the classification of surgical procedures by Altemeier et al. [8], the ASA score and the length of surgery. In our practice, surgical procedures were usually classified as type I and the length of the procedure was based on a simplified score (0 for less than 2 hours; 1 for more than 2 hours).

The JHE index is based on the hypothesis that without surveillance the SSI rate in year (n) will be the same as that of the year before (n-1): to obtain this figure the number of SSI that were prevented must be known [number of surgical procedures/year (n) × rate of SSI/year (n-1) − number of SSI/year (n)] and the increase in the mean length of hospital stay (DMS) [mean DMS with SSI (n) − mean DMS without SSI/year (n)]. Thus, calculations were based on the formula: