The scope of a weekly infection control team rounding in an acute-care teaching hospital: a pilot study

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Short report

Keywords: Infection control, Cross infection, Catheter-related infections, Surgical wound infection, Infection control, Infection safety practices

Posted Date: April 20th, 2020

DOI: https://doi.org/10.21203/rs.3.rs-21478/v1

Version of Record: A version of this preprint was published on August 15th, 2020. See the published version at https://doi.org/10.1186/s13756-020-00787-6.

Abstract

Activities of infection control and prevention are diverse and complicated. Regular and well-organized inspection of infection control is essential element of infection control program. The aim of study was to identify strong points and limitations of weekly infection control rounding (ICTR) in an acute care hospital. We conducted infection control rounding weekly to improve the compliance of infection control in the real field at a 734-bed academic hospital in Republic of Korea between January, 18, 2018 to December, 26, 2018. We investigated the functional coverage of a weekly ICTR. The result of the rounding are categorized well maintained, improvement is needed, long-term support such as space or manpower is needed, not applicable and could not observed. ICTR visited median 7 times [interquartile range (IQR) 6–7 times] per department. When visiting a department, ICTR observed median 16 practices (IQR 12–22). There were 7452 results of practices. Of those results, 75% were monitored properly, 22% were not applicable, and 4% were difficult-to-observe. Among applicable practice results, the most common practices that were difficult to observe were strategies to prevent catheter-related surgical site infections and pneumonia, injection safety practices, and strategies to prevent occupationally-acquired infections. The ICTR was able to maintain regular visits to each department; however, additional observation is necessary to eliminate blind spots.

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Background

Healthcare-associated infections (HAIs) significantly contribute to patient mortality and morbidity [1]. Leadership rounding for HAI prevention has emerged as a method to maintain and develop HAI-preventive practice in healthcare units [2, 3]. Previous studies have found that leadership rounding for strategic discussions, including catheter-associated urinary tract infections [4], surgical site infection (SSI) [5], central line-associated bloodstream infections (CLABSI) [2, 4], has been shown to have a dramatically positive effect on reducing HAI rates. Infection control activities are diverse and complex, as they include practices that protect healthcare workers, visitors, trainees, and patients from infections. To our knowledge, no previous study has comprehensively examined all categories of infection control activities, including hand hygiene practice, injection preparation, environmental prevention of infection, and medical device sterilization. The aim of the present study was to investigate the functional scope of screening on infection control activities. We assessed hospital staff infection prevention practices through examining the applicability of each item on the rounding checklist in real hospital setting. This study identified blind spots in weekly infection control team rounding (ICTR) performance.

Methods And Materials

We conducted ICTR weekly at a 734-bed academic hospital in the Republic of Korea, from January to December 2018. This study was approved by the Institutional Review of Board of this hospital. The purpose of the rounding was to improve compliance with infection control measures and determine the

categories that needed improvement, or financial or administrative support. The monitoring team included five infection practitioners and four infectious diseases physicians. Each infection control rounding took about 2 hours.

A total of 9 categories with 85 infection control and prevention practices were observed. The 9 categories were included (1) hand hygiene (8 practices), (2) safety injection practice (9 practices), (3) isolation (10 practices), (4) strategies to prevent occupationally-acquired infection (6 practices), (5) practices to prevent catheter-related (central, urine catheter), surgical site infection and pneumonia (16 practices), (6) decontamination, disinfection, and sterilization (19 practices), (7) linen and laundry management (6 practices), (8) environmental prevention of infection (8 practices), and (9) maintaining negative/positive pressure (3 practices) (Supplemental Table 1)[6].

In each ICTR, at least two categories were monitored. Categories including (5) practice to prevent catheter-related (central, urine catheter), surgical site infection and pneumonia and (6) decontamination, disinfection, and sterilization, which were monitored separately, as they required detailed review of a large number of practices. The results of the rounding were categorized into five groups: “well maintained,” “improvement needed,” “long-term support such as space or manpower is needed,” “not applicable,” or “could not be observed.”

Statistical analysis

Statistical analyses were performed using R software (version 3.6.1) To determine the effect of infection control rounding, the proportion of items designated as “improvement needed” within the “well maintained” plus “improvement needed” group was calculated. Segmented general linear regression analysis was performed. Variables with p-values ≤ 0.05 were considered statistically significant and summary statistics were expressed as prevalence ratio (PR) and 95% confidence interval (CI).

Results

During the study period, ICTRs were performed for a total of 45 times in 36 departments. ICTR visits were performed in each department for a median of 7 times [interquartile range (IQR) 6–7 times]. When visiting a department, ICTRs observed a median of 17 practices (IQR 16–28), and there were 7452 practice results, of which 74.6% (5558) could be observed: “well-maintained” practices constituted 69.9% (5208), “improvement needed” accounted for 4.4% (331), and “long-term support needed” accounted for 0.3% of all practices (19). A total of 1601 (21.5%) results were not applicable and 293 (3.9%) were difficult to observe through ICTR. Among applicable practice results, the most common practices that were difficult to observe were strategies to prevent catheter-related, surgical site infection and pneumonia (12.6%, 68/538), injection safety practices (8.6%, 65/758), and strategies to prevent occupationally-acquired infections (6.4%, 37/578) (Table 1).

Table 1
Results of infection control team rounding

Categories of practices	A (%)	B (%)	C (%)	D (%)	E (%)	Total
Hand hygiene	936 (93.6)	46 (4.6)	0	0	18 (1.8)	1000
Safety injection practice	664 (75.0)	28 (3.2)	1 (0.1)	127 (14.4)	65 (7.3)	885
Isolation	391 (57.5)	12 (1.8)	0 (0)	262 (38.5)	15 (2.2)	680
Strategies to prevent occupationally acquired infection	506 (80.6)	35 (5.6)	0	0	37 (5.9)	628
Practice to prevent catheter-related (central, urine catheter) or surgical site infections and pneumonia	451 (48.6)	19 (2.0)	0 (0)	390 (42.0)	68 (7.3)	928
Decontamination, disinfection, and sterilization	1349 (69.6)	128 (6.6)	12 (0.6)	388 (20.0)	61 (3.1)	1938
Linen and laundry	451 (78.7)	33 (5.8)	6 (1.0)	77 (13.4)	6 (1.0)	573
Environmental prevention of infection	403 (68.1)	24 (4.1)	0	142 (24.0)	23 (3.9)	592
Maintain negative/positive pressure	57 (25.0)	6 (2.6)	0	165 (72.4)	0	228
Total	5208 (69.9)	331 (4.4)	19 (0.3)	1601 (21.5)	293 (3.9)	7452

A: “well maintained”, B: “improvement is needed”, C: “long-term support such as space or manpower is needed”, D: “not applicable” and E: “could not be observed.”

The proportion of items designated as “improvement needed” over “well maintained” plus “improvement needed” groups is shown in Fig. 1. In a segmental linear regression analysis, two breakpoints were selected, each with break point 1 of 9.2 (95% CI: 8-10.4) and break point 2 of 10.8 (95% CI: 9.8–11.8). The proportion decreased before breakpoint 2, but increased after breakpoint 2, without showing statistical significance (Interval 1: PR = 0.980, 95% CI = 0.911–1.054, *p*-value = 0.525; Interval 2: PR = 0.527, 95% CI = 0.215–1.291, *p*-value = 0.141, Interval 3: PR = 1.601, 95% CI = 0.753–3.402, *p*-value = 0.187).

Discussion

The majority of HAI prevention practices could be monitored by regular ICTR. As a result of ICTR and the following assessment, we found that the reasons behind underperformance in some infection control activities lie at individual and organizational levels. Moreover, we identified a limitation of regular ICTR:

some infection control activities are neither applicable to patients nor able to be monitored by ICTR. Infection prevention practices associated with breathing device-related infection, and SSIs were found to be more difficult to monitor. Considering these findings, it is necessary to revise the protocol, so that all infection control activities can be practiced and monitored correctly, in accordance with the manual.

The majority of the previous studies have investigated the benefits of leadership rounding incorporation to infection prevention [2, 4, 5, 7, 8]. Those studies focused on the association between infection control activities with rounding and one type of infection. Although these assessment indicated such approach was successful in the studied context, a lack of comprehensive perspective on the mechanisms of this success has been a limitation of the previous studies. The present study examined the monitoring of the entire infection prevention protocol, with a grade-based assessment of infection control activities. For this purpose, we checked all infection control activities related to a variety of infections, rather than focusing on one specific infection. As a result, we could delineate the functional coverage of ICTR monitoring and applicability of each infection prevention activity. Notably, this method of assessment spotlights the practices that require organizational decisions and changes beyond individual performance that are needed for improvement. For example, the present study identified that implementing improvements in linen and laundry management requires additional budget.

The present pilot study is the first study to specify items that require monitoring for hospital-associated infection control. To our knowledge, there is no previous study that suggests a comprehensive list of monitoring items requiring monitoring, which is necessary for structural improvement of the ICTR system. Though we could not suggest validity of grounds to select each item for absence of the previous study, the list consists of items necessary for infection control, which the Korean government also applies to assessment of medical institute. Therefore, medical institutes can refer to the present study in order to stick with the criteria of certification assessment. Furthermore, the present study distinguishes between items that can be monitored via organizational ICTR of a particular department and those that cannot. In case of the latter group, additional time and human resources or an alternative approach to monitoring might be required. For example, institutes might decide to designate one or two people as responsible for the entire monitoring process in a particular department, rather than sharing responsibility across departments. A suitable observation method should be determined given the specific circumstances of each medical institute.

Despite such merits, the present study has some limitations. In particular, this study's lack of representativeness, associated with low diversity of the sampled population, is problematic. Samples were collected from a single Korean hospital; as such, the present study findings might not be generalizable to other hospitals.

In the present study, we investigated challenges to ICTR based on observed performance levels. Hospitals need to focus on potentially inappropriate practices, and, if a problem is found, revise the protocol to expand the functional scope of the ICTR. Furthermore, each medical institute should consider what interventions can be implemented at an individual level, and what problems require organizational

support. Such activities allow healthcare settings to be better prepared against events such as the COVID-19 pandemic.

Abbreviations

HAIs:Healthcare-associated infections; SSI:Surgical site infection; ICTR:infection control team rounding; IQR:interquartile range.

Declarations

Ethic approval and consent to participate
The study was conducted under the approval of the Soonchunhyang University Seoul Hospital Review Board (2009-05-017). The requirement of informed consent was waived due to the retrospective nature of the analysis.
Availability of data and materials
All data generated or analyzed during this study are included in this published article and its additional files.
Consent for publication
Not applicable.

Competing interest
The authors have no potential conflicts of interest regarding the research, authorship, and publication of this article.

Funding
This research was supported by the Soonchunhyang University Research Fund.

Author’s contributions
Conceptualization: Jeong YS, Kim JH, Park SY, Data curation: Jeong YS, Kim JH, Lee SY, Kim GE, Oh SM. Investigation: Jeong YS, Kim JH, Lee S, Park SY, Formal analysis: Jeong YS, Kim JH, Park SY, Methodology: Park SY, Lee E, Lee EJ, Kim TH, Supervision: EJ Lee, Kim TH, Writing-original draft: Lee S, Park SY. Writing-review & editing: Jeong YS, Kim JH, Lee S, Lee SY, Kim GE, Oh SM, Lee E, Lee EJ, Kim TH, Park SY

Acknowledgements
The authors thank Suyeon Park, Department of Biostatics, Soonchunhyang University, Seoul Hospital, for her statistical assistance. We also thank all colleagues, and staff of our hospital who shared their time and knowledge to make our hospital safer against COVID-19.

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Figures

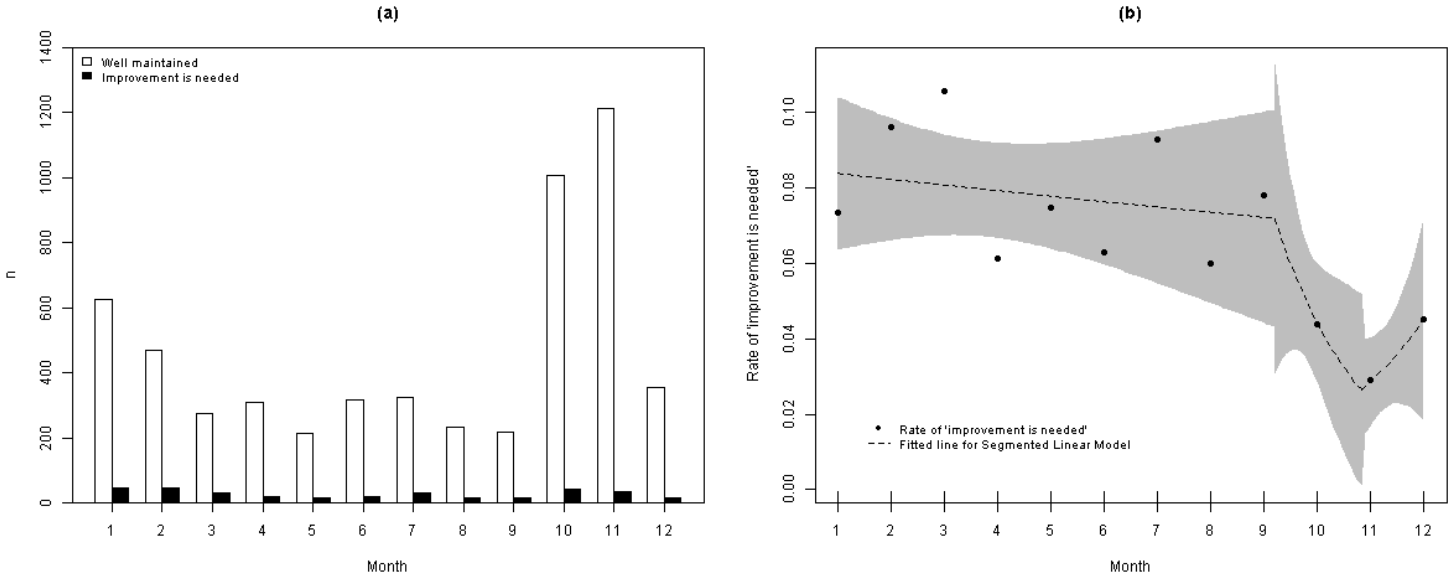

Figure 1

(a) The numbers of well maintained and improvement is needed, (b) rate of improvement is needed and fitted line for Segmented Linear Model.

Supplementary Files

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