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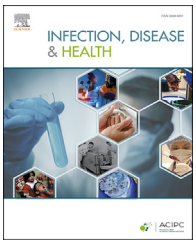

RESEARCH PAPER

The use of clinical coding data for the surveillance of healthcare-associated urinary tract infections in Australia

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KEYWORDS
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Abstract *Introduction:* Given the trends in antimicrobial resistance, particularly for Gram-negative organisms, the surveillance of urinary tract infections (UTIs) has the potential to become increasingly important in the future. Whilst considering accuracy and efficiency, we undertook a cohort study in a large Australian health district to inform future discussions around surveillance approaches to healthcare-associated UTIs (HAUTI).
Methods: A retrospective cohort study in eight hospitals was conducted to examine the clinical coding data of all patients hospitalised for more than two days over a four-and-half-year period. These data were compared to a conservative laboratory-based HAUTI definition.
Results: The data from 162,503 patient admissions were examined. During the study period, 2821 of the admitted patients acquired a HAUTI. Of those patients identified as having a laboratory-diagnosed HAUTI, 29.3% had a clinical code relating to a UTI.
Conclusion: The clinical coding data used to identify cases of HAUTI is very unreliable as a significant proportion of cases were not identified. To ensure the efficient and effective use of resources, a range of approaches should be considered in the event of HAUTI surveillance being required.

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Highlights

- There are a number of limitations to using administrative data for healthcare associated urinary tract infection surveillance.
- Clinical coding data for identifying cases of healthcare associated urinary tract infection is very unreliable.
- Coding data alone should not be relied upon for the surveillance of healthcare urinary tract infections.

Introduction

One approach to the surveillance of healthcare-associated infections is the use of clinical coding data [1]. Other approaches including the use of point prevalence study or continuous surveillance. An advantage of using clinical coding data is that it is potentially less time-consuming, particularly when the population being observed is large and surveillance is being undertaken in a continuous rather than a point prevalence manner. A potential disadvantage is the reliability of such an approach.

In Australia, there is already debate about the utility of using clinical coding data for some relatively rare, but serious, healthcare-associated infections [2—4]. Surveillance of urinary tract infections (UTIs) has the potential to become more important in future years given the frequency of prevalence, trends in antimicrobial resistance and recent data suggesting it contribution to increased length of stay in hospital [1,5,6]. Whilst considering accuracy and efficiency, we undertook a study in a large Australian health district to inform future discussions around surveillance approaches to healthcare-associated UTIs (HAUTI).

Methods

Design and setting

Our retrospective cohort study examined clinical coding data from all patients hospitalised for more than two days over a four-and-half-year period. The study was conducted in eight participating hospitals in one health district in New South Wales between 1 January 2010 and 30 June 2014.

Data collection and definitions

Data were collected from two sources in each hospital: the clinical coding department and the microbiology department. The datasets were merged using each patient's hospital number, date of birth, and sex. A patient was considered to have a HAUTI if they had a positive urine culture more than two days after admission. The urine culture must have been positive for at least one Enterobacteriaceae species with a concentration $\geq 10^5$ per mL of urine and no more than two species of microorganisms [7—10]. 89% of these positive urine cultures exhibited pyuria (>10 WC $\times$ 10^6/L), 62% has a white cell count of ≥ 50. The included cultures represented 76% of all urines that grew some sort of organism with a count of $\geq 10^5$/mL.

All patients who did not meet the definition of a HAUTI were classified as being infection free during their admission. The following International Classification of Diseases Tenth Revision, Australian Modification, (ICD-10-AM) (9th edition) were used to identify possible cases of UTI from the clinical coding data: N39.0 (UTI site not specific), O96.2 (UTI following delivery) and P39.3 (neonatal UTI). Reviewing the Australian Consortium for Classification Development coding standards, no definition of a urinary tract infection could be located [11—13].

Data analysis

A descriptive data analysis was performed using IBM SPSS version 20.0 (IBM, New York, NY). The clinical coding data identifying UTIs were compared to the laboratory-based HAUTI definition. A cross tabulation was performed comparing the clinical coding data against the laboratory-diagnosed HAUTI definition.

Ethical considerations

Ethics approval for this project was provided by the Human Research Ethics for the health district and the Human Research Ethics Committees at the Avondale College of Higher Education.

Results

There were 162,503 patient admissions to the eight participating hospitals during the study period. Over the study period, 2821 of the admitted patients acquired a HAUTI. Table 1 provides a cross tabulation of the number of cases of UTI identified using ICD-10-AM coding data versus those categorized using the laboratory definition of HAUTI. Of note, 29.3% of the laboratory-diagnosed cases of HAUTI were identified as have had a UTI according to the clinical coding data. There were also instances where the clinical coding department identified cases of UTI that were not detected using the laboratory definition of HAUTI. It is important to note however that the HAUTI definition is not inclusive of all UTIs, and therefore these percentages were not calculated in Table 1. Of the 6958 patient admissions that were coded as a UTI, there was no laboratory pathogen isolated with Enterobacteriaceae from urines corresponding to these patients in 3189 instances (45.8%).