

CONCISE REPORT

Expansion of a province-wide surveillance protocol to include community onset healthcare-associated *Clostridium difficile* infection

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ABSTRACT

Objectives: To expand the CDI surveillance protocol to capture information about patients with community onset healthcare-associated *C. difficile*.

Methods: A series of consultations were held with experts in medical microbiology, infectious diseases, information technology, and infection control. Four main issues were to be addressed: database evaluation; revision of inclusion criteria; data collection evaluation; and improved access to provincial electronic health records database.

Results: The revised CDI surveillance protocol was launched on April 1, 2016. The database was revised to incorporate changes to the inclusion criteria, as well as data collection. Preliminary results indicate that one-third of the patients diagnosed with HA-CDI in Saskatchewan have symptom onset in the community.

Conclusions: Inconsistencies in surveillance definitions and access to data can negatively affect a multi-jurisdictional surveillance program. Early involvement of those performing data collection is critical for the success of the program.

KEY WORDS

Clostridium difficile; surveillance; healthcare-associated

INTRODUCTION

Clostridium difficile infection (CDI) is a virulent healthcare-associated infection that is easily spread among patients/residents in healthcare facilities (1). Its severe consequences demand a reliable surveillance protocol in order to support outbreak investigations, monitor trends, and evaluate interventions aimed at reducing incidence.

Recent studies suggest that the epidemiology of healthcare-associated CDI (HA-CDI) is changing. Although CDI continues to be predominantly a healthcare-associated infection, with 94% of all CDI being related to a recent healthcare exposure, location of onset of these infections has begun to shift from acute care hospitals to long term care (LTC) facilities or outpatient settings (2-5). Presently, there is limited Canadian surveillance information about cases presenting to these settings due to challenges obtaining timely and consistent data.

In 2012, a provincial CDI surveillance system was launched in Saskatchewan that included all patients over one year of age with

CDI who were in an acute or LTC facility at the time of diagnosis. The regional Infection Control Professionals (ICPs) charged with data collection experienced various challenges obtaining notification of all cases. In 2014, CDI became reportable to public health in Saskatchewan (6). However, due to the existence of the provincial surveillance protocol, tracking of CDI was deemed to be the role of ICPs and not public health, so it became imperative that notification systems to ICPs be improved. In November 2015, ICPs began receiving all CDI toxin positive lab reports from the provincial lab directly and confidence grew that ICPs were receiving notification of most, if not all, CDI cases.

A review of the program and recent literature in late 2015 indicated that the 2012 protocol was working well to achieve the initial goal of capturing quality data on those patients diagnosed with CDI while in a healthcare facility, but it was excluding valuable information from those patients with recent healthcare admissions who were diagnosed with CDI in outpatient settings. The goal of the revised protocol was to expand the inclusion

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Potential conflicts of interest

The author reports no conflicts of interest related to this article. Patient confidentiality is protected in this protocol by codifying the recorded information, making it only identifiable to the individual region's infection control team.

criteria to allow the capture of information for those patients diagnosed with HA-CDI with symptom onset in the community.

METHODS

Late in 2015, provincial Infection Control Coordinators (ICCs) within the Ministry of Health held a series of consultations with regional ICPs currently responsible for CDI data collection and reporting, as well as with experts in medical microbiology, epidemiology and information technology (IT). It was desirable to address four main issues in the new protocol:

- Evaluate existing (Epidata) database and revise or develop new as necessary.
 - Assess whether new, improved options exist for data collection and analysis.
 - Revise existing or develop new database to incorporate expanded inclusion criteria, updated facility codes and other changes as needed.
- Better align Saskatchewan's CDI surveillance protocol with the Canadian Nosocomial Infection Surveillance Program (CNISP) CDI surveillance protocol (7).
 - Update surveillance case definitions in provincial protocol to match those in most recent CNISP protocol.
 - For convenience of the acute care facilities in the province that also participate in the CNISP surveillance program: Investigate feasibility of developing one data collection form for both surveillance programs and ensure new database has ability to filter out cases meeting CNISP criteria to allow for cross-referencing.
- Identify ways for ICPs to obtain permission to access new provincial electronic health records database (eHR Viewer).
 - Access is critical for identifying if patients meet expanded inclusion criteria (i.e. had previous admission to any healthcare facility in the province in the past four weeks).
- Data collection evaluation.
 - Evaluate what data remained important to collect and what could be discontinued in an effort to balance increased workload for those doing data collection and entry.

RESULTS

Revisions to the Saskatchewan CDI Surveillance protocol for 2016-17 (8) and EpiData database for CDI data collection were completed by January 2016 and went through pilot testing in February. Data collection using the new protocol began April 1, 2016. Results from the first two quarters of fiscal year 2016-17 indicate that 27% (Q1) and 31% (Q2) of the patients diagnosed with HA-CDI had symptom onset in the community and information about treatment of those patients is proving useful in developing new antimicrobial stewardship initiatives.

In order to implement the surveillance protocol expansion, the following decisions were made and actions taken:

First, the decision was made to simply revise the programming in the existing version of EpiData (v3.1) as there was no additional cost and everyone was familiar with using it.

Second, given that the inclusion criteria for the CNISP and provincial CDI surveillance systems are different; the three participating CNISP sites in the province elected to continue

use of two separate data collection forms to avoid confusion. Changes were made to the Saskatchewan data collection form to provide a more visually appealing form that is similar to that used by CNISP and the database was designed to allow regions to filter out cases meeting CNISP criteria to allow for cross-referencing. It is important to note that Saskatchewan's surveillance protocol is now aligned with CNISP in terms of case definitions for primary and recurrent CDI cases, as well as definitions for healthcare-associated (HA) and community-associated (CA) CDI. However, inclusion criteria differ in that Saskatchewan's protocol includes those patients over one year of age that have been diagnosed anywhere in the province (inpatient and outpatient), while the CNISP protocol only includes those over one year of age that were diagnosed during an acute inpatient visit.

Third, advocacy at a provincial level for the role of ICPs in this and other provincial surveillance initiatives resulted in the addition of the ICP job description to the approved access list for the new provincial electronic health records database (eHR viewer). This allows approved users to search for lab results and admissions data for a patient anywhere in the province, not only within a specific health region.

Finally, the decision was made to discontinue collection of risk factor data, including prescription of antibiotics in the previous six weeks. This was deemed to be information that was fairly labor intensive to collect, has already been well documented in the literature, and is already being used to improve patient outcomes through antimicrobial stewardship and other education initiatives.

DISCUSSION

Development of a surveillance protocol that crosses jurisdictions is always challenging. In 2012, the decision to begin a provincial surveillance program with *C. difficile* infections was due to the presumed ease of obtaining lab results and the ability to use relatively objective case definitions that were already being used by most health regions in the province. During the first three years of data collection, information was gathered that demonstrated a variety of inappropriate treatment regimens for new and recurrent cases, and identified trends in new CDI cases, as well as CDI outbreaks within regions and across the province. This information has been incorporated into the provincial CDI management guidelines (9) and education tools in an effort to educate staff and physicians about how to prevent the spread of CDI within the facilities.

Despite the wealth of information that was obtained with the 2012 version, the time had come to expand the scope of the program to incorporate those patients with CDI onset in the community. During the expansion process, several lessons were learned:

Despite the desire to streamline data collection and align with CNISP, attempts to combine data collection into one form were unsuccessful because of fundamental differences in inclusion criteria (i.e., CNISP excludes cases diagnosed in mental health, LTC, and outpatient settings). Current initiatives, such as the National Surveillance Case Definition Standardization project

(10), that are endeavoring to develop Pan-Canadian surveillance definitions for a variety of infections, including CDI, will continue to be supported and encouraged by those in Saskatchewan. In the meantime, consideration was given to a surveillance design that would allow those cases that meet the case definitions and criteria for CNISP to be easily filtered from the provincial data.

Lab and admissions data that was believed to be readily accessible by ICPs had privacy restrictions that required special permissions at the Ministry level and top level support at the regional level. Consistent access to lab and admissions information is vital to the success of a surveillance program but is often a challenge to obtain due to valid privacy concerns or other technology issues. When designing a surveillance protocol that crosses jurisdictions, it is important to consider whether or not access is available to all who will be participating. The best surveillance programs must have input by those who are collecting the data and those who will be making use of the collated information.

Finally, it takes a great deal of time and effort for staff to collect this type of surveillance data. It is vitally important that the information obtained is evaluated frequently to determine if it is useful for making improvements to patient outcomes.

Results from the first half of the 2016-17 surveillance year indicate that one-third of the patients being diagnosed with HA-CDI in Saskatchewan are having symptom onset in the community and these would not have been captured using the previous version of the provincial CDI surveillance protocol. Information gathered from this expanded surveillance is being used to develop improved management guidelines and inform additional antimicrobial stewardship initiatives.

REFERENCES

1. Association for Professionals in Infection Control & Epidemiology, Inc. (APIC), "Guide to the Elimination of *Clostridium difficile* in Healthcare Settings" (Washington, DC: APIC, 2008). [http://www.apic.org/Resource/_EliminationGuideForm/5de5d1c1-316a-4b5e-b9b4-c3f9eac1b53e/File/APIC-Cdiff-Elimination-Guide.pdf – retrieved Dec 2015]
2. Centres for Disease Control and Prevention. "Vital Signs: Preventing *Clostridium difficile* infections." *MMWR Morbidity and Mortality Weekly Report* 61 (March 2012): 157-162.
3. Lessa FC, Mu Y, Bamberg WM et al. "Burden of *Clostridium Difficile* Infection in the United States" *N Engl J Med* 2015;372:825-34.
4. Pawar D, Tsay R, Nelson DS, et al. Burden of *Clostridium difficile* infection in long-term care facilities in Monroe County, New York. *Infect Control Hosp Epidemiol* 2012;33:1107-12.
5. Severe *Clostridium difficile*-associated disease in populations previously at low risk – four states, 2005. *MMWR Morbidity and Mortality Weekly Rep* 2005;54:1201-5.
6. Saskatchewan Ministry of Health, "Communicable Disease Manual, Appendix Table 1: Category I Communicable Diseases" (Regina, SK: Saskatchewan Ministry of Health, Amended August 2014). [<http://www.qp.gov.sk.ca/documents/gazette/part2/2014/G2201432.pdf> – retrieved February 2015]
7. Canadian Nosocomial Infection Surveillance Program (CNISP), "2015-2017 Surveillance for *Clostridium difficile* infection (CDI)" (Ottawa, ON: Public Health Agency of Canada, Revised November 2015).
8. Saskatchewan Ministry of Health, "*Clostridium difficile* Infection (CDI) Surveillance Protocol: Saskatchewan" (Regina, SK: Saskatchewan Ministry of Health, March 2016). [<http://www.saskatchewan.ca/~media/files/health/health%20and%20healthy%20living/health%20care%20provider%20resources/treatment%20procedures%20and%20guidelines/infection%20prevention%20and%20control%20program/cdi%20surveillance%20protocol%20march%202016.pdf> – retrieved Nov 2016]
9. Saskatchewan Ministry of Health, "Guidelines for the Management of *Clostridium difficile* Infection (CDI) in all Healthcare Settings" (Regina, SK: Saskatchewan Ministry of Health, August 2015). [<http://www.saskatchewan.ca/government/health-care-administration-and-provider-resources/treatment-procedures-and-guidelines/infection-prevention-and-control-program> – retrieved Dec 2015]
10. Canadian Patient Safety Institute (CPSI), "An Infection Prevention and Control Action Plan", July 2015. [[http://www.patientsafetyinstitute.ca/en/About/PatientSafetyForwardWith4/Documents/Infection%20Prevention%20and%20Control%20\(IPAC\)%20Action%20Plan.pdf](http://www.patientsafetyinstitute.ca/en/About/PatientSafetyForwardWith4/Documents/Infection%20Prevention%20and%20Control%20(IPAC)%20Action%20Plan.pdf) – retrieved Nov 2016] *