PICNet
PROVINCIAL INFECTION CONTROL NETWORK OF BRITISH COLUMBIA
A program of the Provincial Health Services Authority

PHSA Laboratories
Public Health Microbiology & Reference Laboratory

Healthcare-associated infections surveillance report

Carbapenemase-producing organisms (CPOs) update

November 2017

Highlights for Q1 2017/18 (April 1 – June 16, 2017)

- 40 new cases of CPO were identified among 35 patients in BC acute care facilities
- NDM was the most common gene identified (27/40 cases, 67.5%)
- 31 cases (77.5%) reported healthcare exposure outside Canada. No known risk factors were observed among 4 cases (10.0%)

What are carbapenemase-producing organisms (CPOs)*?*

Carbapenems are a class of antibiotics usually reserved to treat serious infections, and often considered one of the antimicrobial treatments of last resort. Over the last decade, some bacteria have developed resistance to carbapenems by producing an enzyme (carbapenemase) that breaks down the structure of these antibiotics. These antibiotic-resistant bacteria are called carbapenemase-producing organisms (CPOs).

Why are CPOs considered important?

CPOs are an important emerging threat to public health. First, these organisms are often resistant to multiple classes of antimicrobials, substantially limiting treatment options. Second, infections caused by these organisms are associated with high mortality rates, up to 50% in some studies. Third, many carbapenem resistance genes can be transmitted from one species of bacteria to another, potentially facilitating widespread resistance. Fourth, since *Enterobacteriacae* are a common cause of infections, carbapenem resistance in these organisms could have far-reaching impact. Outbreaks of CPOs are more difficult and costly to contain.

How are CPOs spread*?*

People can carry CPOs without causing any symptoms of illness (this is called colonization), but they still can pass the germs to other people. CPOs usually spread person-to-person through contact with infected or colonized people, or via contaminated surfaces. This can happen in both community and healthcare settings. Without proper precautions, CPOs can spread easily from person to person in hospitals, especially in countries where CPO is endemic.

How can we prevent the spread of CPOs?

Good hand hygiene by both healthcare providers and patients, such as washing hands often with soap and water or an alcohol-based hand sanitizer, is a simple and effective way to prevent the spread of CPOs. The public should avoid unnecessary exposure to health care in endemic countries. In healthcare settings, identifying CPO cases and placing colonized or infected patients on contact precautions, using medical devices and antimicrobials wisely, carefully cleaning and disinfecting rooms and medical equipment can significantly reduce the risk of CPO transmission.

How can CPOs be treated?

CPO colonizations do not need to be treated with antibiotics. If a CPO is causing an infection, the antibiotics that will work against it are limited, but some options are still available. In addition, some infections may be treatable with other therapies, such as draining the infection.

Tracking CPOs in BC

The first CPO case in BC was identified in 2008 from a traveller returning from an endemic country where the patient had exposures to medical procedures. Since then, CPOs have been identified among patients in both community settings and healthcare settings, but remains uncommon in the majority of hospitals.

This quarterly report summarizes the new cases of CPO identified in BC acute care facilities during quarter 1 of fiscal year 2017/18 (Q1, April 1 – June 16, 2017) [1]. Forty new cases of CPO were identified among thirty-five patients during Q1, – thirty patients were identified with a single carbapenemase gene and five patients with two carbapenemase genes, with each gene being counted as a new case of CPO. NDM was the predominant carbapenemase gene identified among the new CPO cases, accounting for 67.5% (27/40) of the cases, followed by OXA-48 (10, 25.0%), and KPC (3, 7.5%).

By health authority[1], thirty-two new CPO cases (80.0%) were identified in Fraser Health, seven cases (17.5%) in Vancouver Coastal Health, and one case (2.5%) in Provincial Health Services Authority. No new cases were identified in Interior Health, Island Health, and Northern Health during Q1.

New cases were investigated for risk factors that may have contributed to CPO transmission in the past twelve months, including healthcare encounters outside of Canada (e.g. overnight hospitalization, certain medical or surgical procedures), close contact with a CPO patient or the patient's environment, transfer from or stay in a care unit which was under investigation for CPO transmission. Of the forty new cases in Q1, thirty-one cases (77.5%) reported healthcare exposure outside Canada, and five cases (12.5%) were associated with other risk factors. Four cases (10.0%) had no known risk factors, meaning that the source of their CPO acquisition could not be identified.

Number of new cases of CPO identified in BC acute care facilities by carbapenemase gene (Q1: April 1 – June 16, 2017)*

Health authority	NDM	OXA-48	KPC	Total
Fraser Health	22	8	2	**32**
Interior Health	0	0	0	**0**
Island Health	0	0	0	**0**
Northern Health	0	0	0	**0**
Vancouver Coastal Health	4	2	1	**7**
Provincial Health Services Authority	1	0	0	**1**
Subtotal in Q1	**27**	**10**	**3**	**40**

* based on the date of specimen collection from which a CPO gene was identified. The number of CPO cases includes new CPO cases identified among inpatients in acute care facilities or hemodialysis patients only. The isolates recovered from outpatients or residents in residential care facilities, or submitted by community laboratories were excluded.

For more information about CPOs and the provincial surveillance program, please visit the PICNet website at https://www.picnet.ca/surveillance/cpo.

[1] CPO cases identified outside of acute care facilities were not included. CPO were designated as a reportable condition in BC on December 22, 2016. BCCDC PHL, PICNet, and Infection Prevention and Control in the health authorities are working with the Provincial Communicable Diseases Policy Advisory Committee to include CPO cases identified in community settings in the current surveillance program.