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 (CPO) update

January 2017

Highlights for Q1 and Q2 2016/17 (April 1 – September 8, 2016)

- 43 new cases of CPO were identified among 39 patients in BC acute care facilities
- NDM was the most common gene identified (29/43 cases, 67.4%)
- 31 cases (72.1%) reported healthcare exposure outside Canada. No known risk factors were observed among 5 cases (11.6%)

Carbapenems are a class of antibiotics usually reserved to treat serious infections, and are often considered one of the antibiotic treatments of last resort. However, 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 (CPO). CPOs can arise through the acquisition of carbapenemase genes from other bacteria. Some common examples of these genes are the New-Delhi Metallo-β-lactamase (NDM) and *Klebsiella pneumonia* carbapenemase (KPC).

CPOs usually spread person-to-person through contact with infected or colonized people, or via contaminated surfaces or medical equipment. Many people with CPOs have the bacteria in or on their body without causing symptoms (this is called colonization). Others may have infections in various body sites (such as bloodstream, urinary tract, surgical site, etc.), with very limited antibiotic treatment options, and consequently poor clinical outcomes. Actions that can help prevent the spread of CPOs include screening patients for CPO, good hand hygiene by both healthcare workers and patients, and thorough cleaning and disinfection of rooms and medical equipment.

Since 2010, the British Columbia Centre for Disease Control's Public Health Laboratory (BCCDC PHL), the microbiology laboratories in healthcare facilities and communities, and infection prevention and control have been working collaboratively on testing for and monitoring CPOs in the province. Following an outbreak of CPOs in a BC hospital in February 2014, a provincially mandated active surveillance program for CPO was established in BC's acute care facilities. Since July 2014, all laboratory isolates recovered from patient specimens that are suspected of harbouring a carbapenemase gene are submitted to BCCDC PHL for confirmatory testing. If an isolate from a patient in an acute care facility is identified with a carbapenemase gene for the first time or with a new carbapenemase gene, it is considered to be a new case of CPO, and is reported to the Provincial Infection Control Network of BC (PICNet).

This report summarizes the new cases of CPO identified in BC acute care facilities during fiscal quarter 1 (Q1, April 1 – June 16, 2016) and 2 (Q2, June 17 – September 8, 2016) of fiscal year 2016/17. Forty-three new cases of CPO were identified among 39 patients during Q1 and Q2, - 35 patients were identified with a single carbapenemase gene, three patients with two carbapenemase genes, and one patient with three carbapenemase genes. NDM was the predominated gene identified among the new CPO cases, accounting for 67.4% (29/43), followed by OXA-48 (11, 25.6%), KPC (2, 4.7%), and VIM (1, 2.3%).

By health authority[1], 33 (76.7%) new CPO cases were identified in Fraser Health, nine (21.0%) in Vancouver Coastal Health, and one (2.3%) in Provincial Health Services Authority, which reported the first CPO case in its facilities.

New cases were investigated for risk factors that may contribute 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 43 new cases in Q1 and Q2, 31 (72.1%) reported healthcare exposure outside Canada. Other risk factors were identified among ten cases (23.3%, including double counting of the cases with multiple risk factors). Five cases (11.6%) 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 and Q2: April 1 – September 8, 2016)*

Health authority	NDM	OXA-48	KPC	VIM	Total
Fraser Health	22	8	2	1	**33**
Interior Health	0	0	0	0	**0**
Island Health	0	0	0	0	**0**
Northern Health	0	0	0	0	**0**
Vancouver Coastal Health	6	3	0	0	**9**
Provincial Health Services Authority	1	0	0	0	**1**
Total in Q1 and Q2	**29**	**11**	**2**	**1**	**43**

* 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 CPO and the provincial surveillance program, please visit the PICNet website at https://www.picnet.ca/surveillance/cpo.

[1] This report did not include the CPO cases identified from isolates submitted by community laboratories, which is becoming reportable from 2017.