



Challenges in Outbreak Management of Carbapenemase-producing Organisms

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SHN.ca



Scarborough Health Network (SHN)

- SHN is a 828 bed tertiary hospital located in Scarborough, Ontario
- SHN consists of three hospitals and eight satellite sites:
 - Birchmount hospital, Centenary hospital, and General hospital
 - Hemodialysis & Mental Health satellite sites
- Our programs and services are designed around the needs of one of Canada's most vibrant and diverse communities

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CPO Index Case

- An in-patient was transferred from a ward room of our medicine unit to the ICU for higher level of care
- The patient had been swabbed for CPO on transfer to ICU as part of a point prevalence being conducted at that time
- *Escherichia coli* OXA 48 gene was identified on a rectal swab
- Six contacts were identified during the patient's 15 day stay on the medicine unit.

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Background on the Index Case

- No known colonization or infection prior to admission
- No travel history in the last 12 months
- No known hospitalizations in the last 12 months
- No known history of carbapenem use
- No known exposure to CPO

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Initial Control Measures

- Additional cleaning of common areas and high-touch surfaces
- Dedicated patient equipment to isolated patients
- Staff education
- Increased hand hygiene and multi-use patient equipment audits
- Contact tracing and a CPO point prevalence was performed



2nd Case Finding

- An additional patient was identified with *Escherichia coli* OXA 48 gene
 - Patient was a roommate of the index case
 - Patient had a negative result on admission to the hospital
- Both the index case and 2nd case were genotyped by Pulsed-Field Gel Electrophoresis (PFGE)





CPO Outbreak

- CPO outbreak declared in Oct 2018 in our 38 bed medicine unit at the General hospital
 - 8 private rooms, 1 semi-private and 7 ward rooms
- Toronto Public Health was consulted
- Outbreak Management team was formed
- The medicine unit was closed to admissions



Mandatory reporting

- New regulations for reporting CPE cases and outbreaks in Ontario as of May 2018 (MOHLTC)
- Suspected outbreak in a health care facility:
 - Two or more patients with CPE with the same carbapenemase (not known to be colonized or infected prior or upon admission) are reported on the same ward/unit(s) in a three-month period.
- Or
- Three or more patients with CPE with the same carbapenemase (not known to be colonized or infected prior or upon admission) are reported at the same health care facility or institution in a three-month period.



Outbreak Control Measures

- Terminal cleaning and sink cleaning performed in all patient rooms
- Additional cleaning of all shared patient equipment
- Point prevalence screens were conducted weekly on the unit for 3 weeks
- Sink where the confirmed case was identified was cultured for CPO



Surveillance Results

- No further cases were identified from the three prevalence screens
- Sink cultured was negative for CPO
- Isolates that were genotyped were found to be genetically closely related

Outbreak was declared over after 17 days



PFGE

SEX	REF_NO	PFGE_PATTERN	RESULTS
M	B192529	A	Arbitrarily designated as Strain A for this E. coli PFGE report ONLY. For research/investigative purposes ONLY.
M	B186435	A1	Arbitrarily designated as Strain A1 for this E. coli PFGE report ONLY. Strain A1 is genetically closely related to Strain A. For research/investigative purposes ONLY.



Challenges

- Delayed identification of CPO cases increased patient exposures
 - Criteria for CPO screening not often met on admission
 - High number of shared accommodation across our sites
- Difficult to determine if there is an outbreak when you are unable to accurately determine the acquisition of a case



Challenges

- Closure of the medicine unit for 17 days during the flu season adversely impacted patient flow
- Patients experienced prolonged hospital stay due to delayed transfer to long-term care facilities

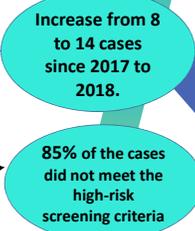


Our Findings at SHN

There has been an increased number of CPO cases detected since 2017

Most cases did not meet the high-risk screening criteria

Most common genes identified were NDM and OXA-48 like genes



Review of Provincial Data

- Increased rates of CPE cases in Ontario
 - 2.4 x increase in positive isolates between 2015 to 2016(PHO, 2016)
- Additionally, current provincial guidelines in Ontario recommends CPE screening for high risk patients, however, 42.6% of the CPE cases reported in the 2016 surveillance data across Ontario did not meet screening criteria for travel history outside of Canada (PHO, 2016)



Outcomes

- As of March 2019, SHN implemented universal CPO screening for all admitted patients (with the exception of mental health, paediatric and family birthing units)
- All of the 4 hospitals that are part of the Shared Hospital Laboratory (SHL) are now screening for CPO on admission





**Don't just sit there and worry. Be proactive.
Do something-anything about what is
worrying you so you can gain information,
focus, and control over the situation. I've
suffered great many catastrophes in my life.
Most of them never happened.**

Mark Twain
