Background

Carbapenem-resistant 
P. aeruginosa is a worldwide problem with increasing reports of carbapenem-producing isolates. These isolates may be resistance related to multiple-drug (MDR) or XDR. This study characterized MER-resistant and carbapenemase-producing PA from Canadian hospitals.

Methods

From January 2007 to December 2016, tertiary-care hospitals in Canada submitted PA from patients attending hospitals. Susceptibility testing was performed using CLSI guideline standards. Resistant isolates were further phenotypically characterized for carbapenem resistance (LM, TPE), VIM-2, IMP-18, 4 (20.0), 2 (8.0), 17 (37), VIM-2, MIC, CazCipMerTob, Clinic / Office VIM-4, 1 (2.8), 4 (7.4), 2 (7.1), 4 (18.2), 3 (5.6), West 4 (14.3), 32 (88.9), 1 (1.7), 19 (57.6), 2007 0.12 - ≥16 CipMerTob 2009 0 (0.0), 0 (0.0), 46 (79.3), 14.40, 6 (30.0), 2 (10.0), 56.38, 8 (32.0), 7 (14.9), CipMerTob CipMerTob >64 8 (28.6), 4 (6.8), 13 (36.1)

RESULTS

1. Incidence of XDR PA have remained low (1.5 to 3.5%) and constant in Canada from 2007–2016.

2. MDR-resistant PA have increased over the surveillance period, reaching a peak of 17.3% in 2014 and are being detected in most provinces.

3. Carbapenemase-producing PA are rare with only 3.4% (n=13) identified among the MER-resistant and XDR PA in this study.

4. Pan-drug resistant PA have not yet been identified in Canada, but treatment options are extremely limited.

5. MDR-resistant and XDR PA remain susceptible to colistin/bacticidin (91.62% and 78.72%, respectively).

6. XDR isolates do not cluster to specific STs however they are associated with some high risk clones ST111, ST117, ST239.

7. High-risk clones (ST11, ST117 and ST239) are seen in limited quantities in Canada. They do not carry any of the tested carbapenemases as often seen in other parts of the world.

8. All GES-5 positive isolates were genetically related (ST11) and were isolated from 2 hospital sites. This is suggestive of a small outbreak resulting in minor genetic diversity (seen with PFGE when spread to different facilities).

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REFERENCES