Multidrug Resistant Pseudomonas aeruginosa (MDR-PSA) in USA Hospitals by Geographic Region in 2015-2016

Abstract

Background: We examined the prevalence of multidrug resistant Pseudomonas aeruginosa (MDR-PSA) in hospitalized patients across different USA geographic regions.

Methods: Utilizing an electronic research dataset established by Becton Dickinson & Company from 348 USA hospitals from July 2015 – June 2016, non-duplicate PSA isolates (first isolate of a species per 30 day period) from all sources were identified as MDR if intermediate/resistant, as defined by NHSN, to > 1 antibiotic in > 3 of the 5 drug classes: cefazidime or cefepime; ciprofloxacin or levofloxacin; aminoglycosides, carbapenems; and piperacillin/tazobactam. Isolates were categorized as either: admission (< 3 days of an inpatient admission and no previous admission within 14 days) or hospital-onset (≥3 days or more post-admission or within 14 days of discharge). Geographic regions were classified into NHSN categories, with Region 1, 7, and 8 being grouped into “other” due to small number of hospitals. We conducted pairwise comparison between regions using the region with the lowest MDR-PSA rate as the reference group.

Results: The overall MDR-PSA rate was 15.1% (7,069/46,729) with admission and hospital-onset rates of admission of 12.3% (2,393/19,491) vs 17.2% (4,676/27,238), respectively (p<0.0001).

Conclusions: The overall MDR-PSA rate was significantly higher for the hospital-onset setting in the US hospitals, with 1 in 6 PSA isolates being MDR positive.

Purpose

We examined the prevalence of MDR-PSA in hospitalized patients across different USA geographic regions.

Methods

• A cohort of the same 348 hospitals reporting data from July 2015 to June 2016 from the Becton Dickinson electronic data research database were analyzed.

• All non-duplicate PSA isolates (first isolate of a species per 30 day period) from respiratory, blood, urine, skin, intra-abdominal, and other sources were identified as MDR if intermediate/resistant to at least 1 of the 5 drug classes: cefazidime or cefepime; ciprofloxacin or levofloxacin; aminoglycosides, carbapenems; and piperacillin/tazobactam. Isolates were categorized as either: admission (<3 days of an IP admission and no previous admission within 14 days) or hospital-onset (≥3 days or more post-admission or within 14 days of discharge).

• Geographic regions were classified into NHSN categories, with Region 1, 7, and 8 being grouped into “other” due to small number of hospitals. We conducted pairwise comparison between regions using the region with the lowest MDR-PSA rate as the reference group.

Results

• The overall MDR-PSA rate was 15.1% (7,069/46,729) with admission and hospital-onset rates of 12.3% (2,393/19,491) vs 17.2% (4,676/27,238), respectively (p<0.0001).

• Significant regional differences were noted within admission and hospital-onset settings compared to Region 10 in both settings (see Table 2).

• The overall MDR-PSA rate was significantly higher for the hospital-onset setting in the US hospitals, with 1 in 6 PSA isolates being MDR positive.

• There was a significant regional difference in MDR-PSA rates. Hospitals in different geographic regions need to be aware of their local epidemiology for MDR-PSA and use this knowledge to target infection control interventions.

Conclusions

• These data were collected from the laboratory information system feeds provided by participating hospitals and relied on interpretive results reported at each facility.

• These data were collected and analyzed from the perspective of unique non-duplicate collected cultures and not from the perspective of unique patients. The goal was to understand the volume and frequency of these organisms that were seen at the level of the hospital microbiology laboratory across a large number of geographic different institutions.

Limitations

• These data were collected and analyzed from the perspective of unique non-duplicate collected cultures and not from the perspective of unique patients. The goal was to understand the volume and frequency of these organisms that were seen at the level of the hospital microbiology laboratory across a large number of geographic different institutions.

References


Acknowledgements

This study is supported by Merck & Co., Inc., Kenilworth, NJ USA. We would like to thank Jason Tell, MPH and John Murray, MPH for their efforts to create the database and analyze this support to us.