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Investigations of Healthcare-Associated *Elizabethkingia* Infections – United States, 2013-2019

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Background

- *Elizabethkingia* bacteria are non-motile gram-negative rods
- Found in soil and water
- Three species associated with human illness:
  - *E. meningoseptica*
  - *E. anopheles*
  - *E. miricola*
- Produces biofilms which can grow in premise plumbing systems
- Emerging cause of infections in healthcare facilities
- Usually causes infections among immunocompromised or chronically ill hosts

Methods

- CDC Division of Healthcare Quality Promotion maintains a database of consultations with state or local health departments related to healthcare-associated outbreaks and infection control breaches
- During investigations, entries for outbreaks are created and updated on a standardized form
- Database searched for consultations involving *Elizabethkingia* species as the primary pathogen of concern January 1, 2013 to December 31, 2019
- Data summarized on healthcare settings, infection types, laboratory analysis, and control measures
- Individual database entries reviewed to obtain additional details

Healthcare Settings Involved in Consultations for *Elizabethkingia* Infections

Healthcare Setting	Consultations n (%)	Cases n (%)
Long Term Acute Care Hospital (LTACH)	4 (44%)	32 (44%)
Ventilator Skilled Nursing Facility (VSNF)	2 (22%)	31 (42%)
Acute Care Hospital	1 (11%)	7 (10%)
Outpatient Ear, Nose, and Throat Clinic	1 (11%)	2 (3%)
Assisted Living Facility	1 (11%)	1 (1%)
Total	**9**	**73**

Mitigation Measures

Efforts to reduce Elizabethkingia in facility water systems:

- Development of water management plans
- Consulting water management specialists
- Flushing water outlets
- Monitoring water quality

Efforts to minimize patient exposure:

- Cleaning of shower facilities and equipment
- Storage of respiratory therapy supplies away from water sources
- Use of splash guards on sinks

Whole Genome Sequencing Results

Whole Genome Sequencing…	Number of Consultations
Utilized during consultation	6
Identified isolates from different patients were closely related	4
Identified environmental isolates were closely related to clinical isolates*	2
Found that a healthcare-associated case was closely related to a large community outbreak	1
Found that isolates initially identified as *E. meningoseptica* were *E. anopheles*	4

*Environmental sources identified included sinks, shower rooms, and a nebulizer cup

Positive Culture Sites Involved in Consultations for *Elizabethkingia* Infections (N=9)	Consultations n (%)
Respiratory Only	4 (44%)
Bloodstream Only	1 (11%)
Respiratory and Bloodstream	3 (33%)
Sinus Only	1 (11%)

Results

- Identified 9 consultations with *Elizabethkingia* as the primary pathogen
- Consultations were from 8 different states in multiple regions of the country
- Involved 73 patients with *Elizabethkingia* infections
- Median number of infections per consultation was 4 (range: 1-28)
- *E. anophelis* was the species most frequently identified from patient isolates

Conclusions

- *Elizabethkinga* is an important emerging pathogen which can cause outbreaks in healthcare settings
- Outbreaks often among chronically ventilated patients
- LTACHs and VSNFs accounted for the majority of *Elizabethkingia* consultations and patient infections
- Robust water management plans and infection control practices to minimize patient exposure to contaminated water are important measures to reduce infection risk among vulnerable patients