Overview of *Candida auris* and Emerging Resistant Candida

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ANTIBIOTIC RESISTANCE THREATS IN THE UNITED STATES

2019

Urgent Threats

These germs are public health threats that require urgent and aggressive action:

- CARBAPENEM-RESISTANT ACINETOBACTER
- CANDIDA AURIS
- CLOSTRIDIODES DIFFICILE
- CARBAPENEM-RESISTANT ENTEROBACTERIACEAE
- DRUG-RESISTANT NEISSERIA GONORRHOEAE
A paradigm shift for *Candida* infections
A yeast that acts like a bacteria!

- Resistance is the norm
- Thrives on skin
- Contaminates patient rooms
- **CAN SPREAD IN HEALTHCARE SETTINGS**
C. auris clinical cases — United States, 2013–June 2020

Number of C. auris clinical cases
- 0
- 1
- 2-10
- 11-50
- 51-100
- 101 or more
- Data out of date
C. auris clinical cases—United States, as of June 2020

- Over 1200 clinical cases
- About 2400 screening cases
COVID-related challenges

- Decreased screening
- Reporting delays
- Changes in patient movement patterns
- Widespread empiric antimicrobial use

*C. auris* sharply increased in recent months in some long-term care facilities with COVID cases
Changing epidemiology?

- Outbreaks happening in previously well-contained areas of the country
  - Southern California
  - Mid-Atlantic
- Cases identified without links to known cases or healthcare abroad
- Transmission seen in acute care hospitals and regular skilled nursing facilities
  - Though most transmission remains in LTACHs and skilled nursing facilities with ventilator care
Most common specimen sources of clinical cases*

- Blood: 40%
- Urine: 25%
- Wound: 10%
- Sputum: 5%

* Cases may be included under multiple specimen sources
Long term Colonization

Patient ID

Days since 1st swab

Negative
Positive

Pacilli et al, SHEA 2019
Resistance (n=1634 US isolates)

- 80% Azoles
- 31% Polyenes
- 1% Echinocandins

- 31% multidrug-resistant
- Pan-resistance found in 2 states, but still rare
- Major differences by clade
C. auris resistance varies geographically - Azole

- Azole resistance*
  - South Asian Clade
    - >99% in NY
    - >99% in NJ
  - African Clade
    - 99% in CA
    - 92% in FL
  - South American Clade
    - 7% in IL

* Clades indicate the predominant clade in that state
C. auris resistance varies geographically – Amphotericin B

- Amphotericin B resistance*
  - South Asian Clade
    - 46% in NY
    - 32% in NJ
  - African Clade
    - 9% in CA
    - 6% in FL
  - South American Clade
    - 1% in IL

* Clades indicate the predominant clade in that state
Antifungal Resistance by Region

- **99% Azole resistant**
- **9% Amphotericin B resistant**
- **3% Echinocandin resistant**

- **92% Azole resistant**
- **6% Amphotericin B resistant**
- **1% Echinocandin resistant**

- **>99% Azole resistant**
- **44% Amphotericin B resistant**
- **1% Echinocandin resistant**

- **99% Azole resistant**
- **9% Amphotericin B resistant**
- **3% Echinocandin resistant**

- **92% Azole resistant**
- **6% Amphotericin B resistant**
- **0% Echinocandin resistant**
Pan-resistant *C. auris*

- 4 unrelated cases reported with resistance to all 3 antifungal classes
  - 3 from New York
  - 1 from Maryland
- None had recent international travel or healthcare
- All were mechanically ventilated and had been in long-term care facilities
- All cases initially had *C. auris* sensitive to echinocandins, but developed resistance after treatment

Candida glabrata

- 12 years of surveillance, >2500 isolates
- 8.6% Fluconazole$^R$
- 3.2% Echinocandin$^R$
- Among Flu$^R$ isolates, 10% also echino$^R$
- Among echino$^R$ isolates, 25% also flu$^R$
Familiar *Candida* species:

- *Candida parapsilosis* – fluconazole resistance in US approaching 10%
- *Candida guilliermondii* species complex – some very high fluconazole MICs in our surveillance

Emerging *Candida* species:

- *Candida haemulonii* - some fluconazole resistance
- *Candida duobushaemulonii* – some fluconazole resistance, high amp B resistance
- *Candida kefyr* – a few high fluconazole MICs
Related *C. haemulonii* species complex transmission

- Whole genome sequencing
- Detected transmission of *C. haemulonii* and *C. duobushaemulonii* in Panama

Related species *C. duobushaemulonii* outbreak in Puerto Rico detected

- Whole genome sequencing
  - 12 isolates from 11 patients <10 SNPs apart
  - 10 isolates from 1 facility
- Collected over a 1.5 years
- Blood & abscess specimens
Resources

- https://www.cdc.gov/fungal/candida-auris
  - Guidance
  - Fact sheets & FAQs
  - PCR and swabbing protocols
  - Sample screening script
  - Interfacility transfer form
- https://www.cdc.gov/drugresistance/laboratories.html
  - AR Lab Network contact info
  - AR Lab Network flyer
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For more information, contact CDC
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