Candida auris—a yeast behaving badly

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DEADLY GERMS, LOST CURES

A Mysterious Infection, Spanning the Globe in a Climate of Secrecy

The rise of Candida auris embodies a serious and growing public health threat: drug-resistant germs.
C. auris Epidemiology
Countries from which *Candida auris* cases have been reported, as of June 30, 2020

Why the 7 year gap?

• 2009-2016 very few reports of *C. auris*

• Retrospective analysis
  • 1996- isolate from blood stream infection in a peds surgery patient from Korea
  • 2008- isolate from Pakistan
  • 2009-2015 SENTRY antifungal surveillance program identified 4 *C. auris* from 15 271 candidemia isolates from 152 international medical centers

• Unknown!
5 major CLADES emerged

- Simultaneous emergence of different clonal populations on 3 different continents rather than spread from a single source

Chow et al, Emerg Infect Dis 2019
Worldwide prevalence ???

• Real prevalence remains uncertain

• Venezuela - outbreak in 2012
  • over 5 months, C. auris was the 6th most common cause of Candidemai

• South Africa - outbreak in 2012
  • over 3 year period 38% of all candidemia cases in a reference hospital in Kenya

• India- outbreak in 2013
  • now C.auris prevalence 5-30% of all Candidemia cases

• Spain outbreak- in 2016
  • largest ongoing clonal outbreak

Cortegiani et al, J Intesive Care 2018
The US experience

- Clinical alert issued in US in 2016 after 7 cases reported over 3 year period
  - 2018- 311 cases
  - 2020- 1200 cases

- Initial cases were a result of hospitalization in a country known to have high prevalence of C. auris
  - Hospitalized weeks to couple years prior to diagnosis

- Subsequent cases a result of local hospital transmission
C. auris imported to North America

Chow et al, Lancet ID, Oct 2018
C. auris outbreaks across US

U.S. Map: Clinical cases of Candida auris reported by U.S. states, as of June 30, 2020

The Canadian Experience

Antimicrob Resist Infect Control. 2020; 9: 82. PMID: PMC7288437
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Prevalence of *Candida auris* in Canadian acute care hospitals among at-risk patients, 2018

Hector Felipe Garcia-Jeldes, 1 Robyn Mitchell, 2 Allison McGeer, 3 Wallis Rudrick, 2 Kanchana Amaratunga, 2 Snigdha Vallabhaneni, 4 Shawn R. Lockhart, 4 CNISP C. auris Interest Group, and Amrita Bharat 5

- First Case of C. auris in 2017 in a patient who had received health care in the Indian subcontinent and was co-colonized with CPO
- March 2020- 24 cases reported to PHAC
- Estimated prevalence is very low- 0.4%
C. auris- a yeast that acts like a bacterium?

- Thrives on skin
- Persists for weeks on surfaces and equipment
- Multi Drug-resistant
- Can spread in healthcare settings causing OUTBREAKS of INVASIVE INFECTIONS
Clinical presentation - wide spectrum

• Colonization

• Superficial skin infection

• Invasive infections
  • Most often deemed to be HAI
  • 44-72% mortality
Risk factors for severe disease

• Sickest of the sick
  • Ventilator dependent
  • Catheterized
  • Tube-fed
  • Bed bound
  • Recent treatment with antibiotics and antifungals
  • Often colonized with other MDR organisms

• Not a threat to healthy individuals
  • Not more invasive than other Candida species
C. auris - on humans

• Colonizes skin- nares, groin and axilla most common
  • Survives very well at body temperatures and higher! (up to 42°C)

• Persist for many months- indefinitely?
  • No decolonization strategies

• Associated with colonization with other MDR organisms ex. CPOs

• Can develop MDR upon exposure to antifungals
C. *auris*- in the environment

- High touch surfaces most commonly contaminated
  - Including mobile equipment (sat probe, vitals machine)

- Can survive over a month on surfaces

- Resistant to some common disinfectants (quaternary ammonium products)

- Reliably susceptible to sporicidal agents
Perfect recipe for Transmission

• Wide spread transmission after introduced into the environment
How did it emerge?

- Proposed theory related to climate change
- Unknown!
Prevention- a multifaceted approach

• Screening patients with hx of hospitalization abroad in last 12 mo

  • A chromogenic screening agar and molecular based assays now available
    • Cost of screening outweighs the benefit of detection in low prevalence setting like SK

• Potential for centralized laboratory testing with pre-emptive isolation of these patients until results available
Prevention- a multifaceted approach

• Early identification from clinical specimens
  
  • Full yeast ID on isolates from sterile body sites only
    • elsewhere considered normal flora

• Misidentification still a problem for sites using non-MALDI TOB identification
  • Awareness is key
Prevention - the basics

• Consistent use of PPE and Hand Hygiene

• Environmental cleaning - high touch surfaces, shared medical equipment
  • Products active against C. diff spores

• Antibiotic and Antifungal stewardship
  • Won’t prevent transmission, but will prevent evolution of MDR
Containment strategies when *C. auris* is found

- Rapid IPC notification and outbreak declaration
  - Even with ONE case
- Prevalence screen
- All IPC measures deployed to minimize transmission
- Prospective surveillance
- Communication at time of transfer
C. *auris* Take home points

- Mysterious emergence across the globe 2016
- Prevalence in Canada is very low
- Colonization is prolonged, perhaps indefinite
- Environmentally hardy
- Easily transmissible
- Poses highest risk to the sickest of patients
THANK YOU!

• Questions?