Candida auris EMERGENCE

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Candida auris in the NEWS 4th November 2016

Candida auris: Get to know about it!

- First described in 2009 from the external ear canal of a patient in Japan.[1]
- The first report of BSIs in 2011 from Korea - persistent fungemia on FLC and AMB therapy.[2]
- In five years, *C. auris* fungemia and deep-seated infections reported in India, South Africa, Kuwait, Brazil, Colombia, Venezuela, USA, UK and Pakistan.[3-7]

[1]Satoh K, et al. Microbiol Immunol 2009;53:41–4, [2]Lee WG, et al. J Clin Microbiol 2011;49:3139–42,
[3]Chowdhary A, et al. Emerg Infect Dis 2013;19:1670–3, [4]Chowdhary A, et al. Eur J Clin Microbiol Infect Dis 2014;33:919–26,
[5]Girard V, et al. Mycoses 2016;59:535–8, [6]Emara M, et al. Emerg Infect Dis 2015;21:1091–2,
[7]Calvo B, et al. J Infect 2016;73:369–74

Candida auris: An emerging fungal pathogen

- Found in 11 countries in 4 continents within 5 years
- Its true burden has not yet been explored
- Cause of emergence
  - *Unkown*
  - *May be antifungal selective pressure*

[1]Satoh K, et al. Microbiol Immunol 2009;53:41–4, [2]Lee WG, et al. J Clin Microbiol 2011;49:3139–42,
[3]Chowdhary A, et al. Emerg Infect Dis 2013;19:1670–3, [4]Chowdhary A, et al. Eur J Clin Microbiol Infect Dis 2014;33:919–26,
[5]Girard V, et al. Mycoses 2016;59:535–8, [6]Emara M, et al. Emerg Infect Dis 2015;21:1091–2,
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Candida auris: Is it serious?

- US CDC requests that laboratories who identify a confirmed a suspected of *Candida auris* isolate notify their state or local public health department and CDC (candidaauris@cdc.gov)
- Identify as far back as January 1, 2013 for past isolates

http://www.cdc.gov/fungal/diseases/candidiasis/candida-auris-qanda.html

Characteristics of the first seven cases of Candida auris identified in the United States—May 2013–August 2016

Patient	Isolation month/ year	State	Site of *C. auris* isolation	Underlying medical condition(s)	Outcome*
1	May 2013	New York	Blood	Respiratory failure requiring high-dose corticosteroids	Died
2	July 2015	New Jersey	Blood	Brain tumor and recent villous adenoma resection	Died
3	April 2016	Maryland	Blood	Hematologic malignancy and bone marrow transplant	Died
4	April 2016	New York	Blood	Hematologic malignancy	Died
5	May 2016	Illinois	Blood	Short gut syndrome requiring total parenteral nutrition and high-dose corticosteroid use	Survived
6	July 2016	Illinois	Urine	Paraplegia with long-term, indwelling Foley catheter	Survived
7	August 2016	New York	Ear	Severe peripheral vascular disease and skull base osteomyelitis	Survived

* Mortality was not necessarily attributable to *C. auris* infection.

Candida auris: Why to concern?

- Often multidrug-resistant to most antifungal drugs
- Difficult to identify with standard laboratory methods
  - *Can be misidentified in labs without specific technology*
  - *Misidentification may lead to inappropriate treatment*
- Outbreaks in healthcare settings
  - *Rapid identification of C. auris in a hospitalized patient is particularly important*

http://www.cdc.gov/fungal/diseases/candidiasis/candida-auris-qanda.html

Candida auris: How to identify?

- Can be misidentified by Vitek 2 and API20C-AUX
- MALDI-TOF can differentiate *C. auris*….***BUT***..
  - NOT all devices currently include *C. auris* in the reference database to allow for detection
- Molecular methods based on sequencing the D1-D2 region of the 28s rDNA can also identify *C. auris*
- Diagnostic methods other than MALDI-TOF and sequencing may NOT be able to distinguish *C. auris*

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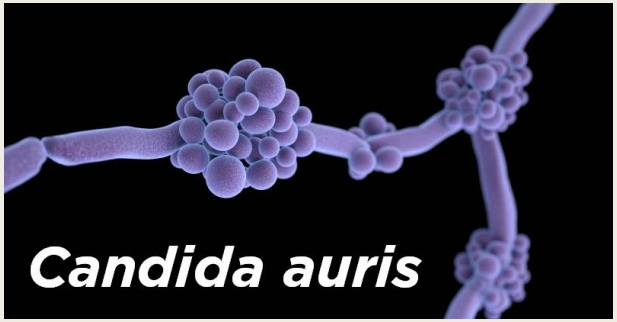
Candida auris: When to suspect?

Yeasts identified by Vitek 2 and API20C-AUX as

- *Candida haemulonii* (some MALDI-TOF may be missed)
- *Candida famata*
- *Candida sake*
- *Candida* spp.
- *Saccharomyces cerevisiae*
- *Rhodotorula glutinis*



Chowdhary A, et al. J Hosp Infect. Published online 2016 Aug 15

Candida auris: What use to treat?

- No established MIC breakpoints
  - *Nearly all isolates are highly resistant to* ***fluconazole***
  - *> 50% of C. auris isolates were resistant to* ***voriconazole***
  - *One-third were resistant to* ***amphotericin B*** *(MIC ≥2)*
  - *A few were resistant to* ***echinocandins***
- Some strains of *C. auris* have elevated minimum inhibitory concentrations (MICs) to the three major classes of antifungals

http://www.cdc.gov/fungal/diseases/candidiasis/candida-auris-alert.html

Candida auris: Mechanism of antifungal resistance

- Phylogenetically related to *C. haemulonii*, which is also known for its intrinsic resistance to AMB and FLU
- Mechanism of antifungal resistance – unclear
- Probably inducible under antifungal pressure with rapid mutational changes
- Presence of single copies of ERG3, ERG11, FKS1, FKS2, and FKS3 genes and ABC and MFS transporter families

Chowdhary A, et al. J Hosp Infect. Published online 2016 Aug 15

Candida auris: What are the clinical syndromes?

- 1. First infections was otitis
- 2. Bloodstream infection
- 3. Wound infections
- Found in respiratory secretions and urine
  - *Infection or colonization?*
- Similar risk factors for infections with other *Candida* spp.
  - *Diabetes mellitus, recent surgery, recent antibiotics, and presence of central venous catheters*

Chowdhary, A., et al. Emerg Infect Dis 2013;19:1670-3

Candida auris: How it spreads?

- Under investigation
- Appears to occur primarily in hospitalized patients
- People traveling to countries where *Candida auris* - not at increased risk
- Within hospitals
  - *Spread from contaminated surfaces and equipment e.g. blood pressure cuffs*
  - *Person to person*

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Candida auris: Can it be epidemic?

- At least two countries had healthcare outbreaks of *C. auris* infection and colonization involving more than 30 patients each
- High degree of clonality within the same hospital
- Transmitted within those healthcare facilities

http://www.cdc.gov/fungal/diseases/candidiasis/candida-auris-alert.html

Candida auris: How to stop spreading?

- Develop hospital policies for the prevention and control of infections with this pathogen
- Before and after contact with hospitalized patients, staff and visitors should clean their hands at all appropriate times
- Staff and visitors should wear personal protective equipment (e.g., gloves, gowns) before going into patients' rooms
- Surfaces and equipment should be disinfected with a chemical that can kill fungi
- Staff and visitors should cover their coughs and sneezes with their elbows

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THANK YOU

Q & A