



Candida auris: epidemiologia, diagnóstico e prevenção

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Candida auris

Porque devemos nos preocupar ?

1. Resistência a múltiplas drogas (3 classes de antifúngicos) = limitada opção terapêutica
2. Comumente identificada erroneamente pelos laboratórios clínicos (casos não diagnosticados)
3. Transmitida entre pacientes (surto de IRAS) => colonizam pele => persistem por semanas => ambiente = DIFÍCIL CONTROLE !!!

Kaitlin Forsberg, Kate Woodworth, Maroya Walters, Elizabeth L. Berkow, Brendan Jackson, Tom Chiller, Snigdha Vallabhaneni. *Candida auris: The recent emergence of a multidrug-resistant fungal pathogen.*

Medical Mycology, 2018, 0, 1-12

Candida auris

- *C. auris* diferente outras espécies
 - Transmissível como bactérias multirresistentes (MRSA, ERC)
 - Não é resultado de autoinfecção (microbiota normal)
 - Multirresistência e alta mortalidade
- Patogenicidade
 - Fosfolipases, proteinases e hemolisinas => capacidade de aderir células hospedeiro e causar invasão
 - Persistência nos tecidos e ambiente
 - Alta capacidade formação de biofilme

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Candida auris

Epidemiologia

- PubMed até março de 2018 (N=109)

Primeiro Caso:

- 2009 no Japão
 - Isolado data de 2006 (GenBank)
 - Paciente internado Hospital Tóquio
- Sequenciamento genético = ITS muito relacionada *C. haemulonii*, *pseudohaemulonii*, *ruelliae*, *heveicola* mas distinta destas
 - Habilidade de crescer a 42°C e assimilação de C diferente
 - Autores propuseram NOVA espécie
 - *auris* = isolada conduto auditivo

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Candida auris

Epidemiologia

- 2011 = 15 pacientes Coréia do SUL
- Isolados de conduto auditivo
- Isolados coletados em 2006 (banco de cepas)
- Todos otite média crônica (7 persistência de culturas positivas)
- Sequenciamento genético = cepa
- Transmissibilidade interhospitalais

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Epidemiologia

- 2013 = relatos de infecções invasivas na Índia
- 2014 = Quênia e África do Sul
- 2015 = Kuwait

- Revisão do SENTRY = > 15.000 isolados *Candida* revistos (2014 e 2015 na Ásia, Europa e Américas)
=> 4 isolados *C. haemulonii* = *C. auris*

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Candida auris

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Candida auris:
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Table 1. Countries where *Candida auris* cases have been reported, as of March 2018.*

Country	Year of first report	Year of earliest isolate reported	Single case or multiple cases reported
Japan ^{†2, 89}	2009	1997	Multiple cases
South Korea ⁵	2011	1996	Multiple cases
India ^{6,7}	2013	2009	Multiple cases
Kenya [‡]	2014	2010	Multiple cases
South Africa ⁹	2014	2012	Multiple cases
Kuwait ¹⁰	2015	2014	Single case
Germany ^{16,90}	2016	2015	Multiple cases
Norway ⁹⁰	2016	NR	Single case
Pakistan ^{§1}	2016	2008	Multiple cases
United Kingdom ³⁹	2016	2013	Multiple cases
United States ^{20,91}	2016	2013	Multiple cases
Venezuela ¹⁵	2016	2012	Multiple cases
Canada ^{28,29}	2017	2017	Multiple cases
Colombia ^{47,48}	2017	2013	Multiple cases
Israel ³⁷	2017	2014	Multiple cases
Oman ⁶¹	2017	2016	Multiple cases
Panama ¹²	2017	2016	Multiple cases
Spain ^{50,90}	2017	2016	Multiple cases
Austria ¹⁶	2018	2018	Single case
Belgium ¹⁶	2018	NR	Single case
France ^{16, 31}	2018	2017	Multiple cases
Malaysia ⁷¹	2018	NR	Single case
United Arab Emirates ⁹²	2018	2017	Single case

Candida auris

Surto

- Colombia
- India
- Paquistão
- Panamá
- Espanha
- Reino Unido
- EUA
- Venezuela

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Candida auris

Surto

- África do Sul = maior causa de candidemia
- EUA = 250 isolados reportados
- 1º caso relatado em 2013 => paciente transferido Emirados Arábes
- 10 estados = New Jersey e New York

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Candida auris

Surtos

Como explicar a distribuição mundial ??

Sequenciamento total do genoma

4 clades geograficamente distintos

Sul Ásia

Sul África

Sul América

Leste Ásia

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Candida auris

Razões para emergência simultânea

????

Hipóteses

1. Pressão seletiva de antifúngicos
2. Reservatórios animais
3. Mudanças ambientais

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Razões para emergência simultânea



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Candida auris

4

Medical Mycology, 2018, Vol. 00, No. 00



Figure 1. Countries from which *Candida auris* cases have been reported, as of March 31, 2018.‡

*Single cases of *C. auris* have been reported from Austria, Belgium, Kuwait, Malaysia, Norway, and the United Arab Emirates.

†Multiple cases of *C. auris* have been reported from Canada, Colombia, France, Germany, India, Israel, Japan, Kenya, Oman, Pakistan, Panama, South Africa, South Korea, Spain, the United Kingdom, the United States, and Venezuela; in some of these countries, extensive transmission of *C. auris* has been documented in more than one hospital.

‡Other countries not highlighted on this map may also have undetected or unreported *C. auris* cases.

Candida auris

Diagnóstico

- Aparelhos automatizados não são capazes de identificar
- Espécies relacionadas
 - *C. haemulonii*
 - *C. famata*
 - *C. catenulata*
 - *C. sake*
 - *Rhodotorula glutini*
- Biologia molecular
- MALDI-TOF updated database

Perfil de Sensibilidade

- Sem breakpoint definido
- Alta resistência a fluconazol
- MICs elevados voriconazol e AmB
- Boa sensibilidade
 - Equinocandinas
- Isolados da Índia => R 3 classes
- Micafungina = melhor performance

Candida auris: a worrisome, globally emerging pathogen. Navalkele BD, Revankar S, Chandrasekar P.

Expert Rev Anti Infect Ther. 2017 Sep;15(9):819-827.

Candida auris

Table 4: List of misidentified *Candida* species by conventional diagnostic methods, requiring further testing for *C. auris* identification

Test Method	Criteria requiring specific test to identify <i>C. auris</i>
Conventional fungal testing	<i>Candida</i> spp. without further identification with one of the following findings: <ul style="list-style-type: none">• difficult to treat infection with no response to antifungals• multiple cases in a single unit• increasingly isolated from urine cultures
API 20C	<i>Rhodotorula glutinis</i> and <i>Candida sake</i>
MicroScan	<i>Candida catenulata</i> , <i>Candida famata</i> , <i>Candida guilliermondii</i> , or <i>Candida lusitaniae</i>
BD Phoenix	<i>Candida catenulata</i>

Candida auris

Apresentação Clínica

- Distribuição bimodal
- Diabetes mellitus e UTI
- Média = 20 dias hospitalização
- Sangue > Urina, canal auditivo, pele e pulmões
- Remoção CVC > melhor prognóstico
- Duração fungemia = 1-3 semanas
- Candidemia persistente

Mortalidade

- Global 30 – 60%
- CDC = 68%
- Estimada = 49 % (19/39 episódios)
- Melhor sobrevida
 - Crianças
 - Controle do foco

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Candida auris

Tratamento

- CDC e ECDC
 - Equinocandinas
 - Terapia combinada = debate (EQ + AmB)
 - Pan R = ????
- Controle do foco = retirada CVC mandatório

Prevenção

- Recomendações como para bactérias MDR
- Isolamento contato
- Quarto privativo
- Coorte pacientes
- Desinfecção ambiental
- Culturas vigilância ativa

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Transmissão

Candida não é micro-organismo que dissemina em ambiente hospitalar

Fatores que facilitam a disseminação

- **Pacientes colonizados = pele**
PVPI 10 % e clorexidine alcoólica = Bom

Banho de clorexidine 4% = surtos

- **Transmissão entre pacientes**

12% contactantes - EUA

21% contactantes - India

Poucas horas

2,8% detecção em mãos PDS

Reino Unido = colonização em PDS = 1/250 positivo

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Candida auris

Controle de Infecção

Like a MDR

Higienização das Mãos

Coorte de pacientes/Quarto privativo

Vigilância ativa

Desinfecção

Estudos in vitro = hipoclorito ou peróxido hidrogênio

CDC = limpeza terminal diária

C. auris

Format: Abstract ▾

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[J Hosp Infect.](#) 2017 Dec;97(4):371-375. doi: 10.1016/j.jhin.2017.08.019. Epub 2017 Sep 1.

Yeasticidal activity of chemical disinfectants and antiseptics against *Candida auris*.

[Moore G](#)¹, [Schelenz S](#)², [Borman AM](#)³, [Johnson EM](#)³, [Brown CS](#)⁴.

⊕ **Author information**

Abstract

Candida auris appears to be transmitted readily between patients, yet information regarding the efficacy of environmental disinfection and skin decolonization is lacking. A quantitative suspension test (EN 13624:2013) was used to evaluate the yeasticidal activity of different chemical disinfectants and antiseptics against *C. auris* and *Candida albicans*. When tested in suspension, both a chlorine-based disinfectant and iodine-based skin antiseptic were effective against *C. auris*, suggesting that their use could reduce environmental contamination and skin colonization, respectively, if applied appropriately. Chlorhexidine-based products may also be effective. However, in this study, activity depended on formulation, specifically the presence of isopropyl alcohol.

Desinfetantes a base de cloro
Antissépticos a base de iodo

C. auris

TABLE 2 | Surface disinfectants tested against *C. auris*.

Disinfectant	Concentrations tested (contact time in minutes)	Effective	Level of evidence	Comments	Reference
Chlorine	0.39% (1), 0.65% (1), 0.825% (1), 1% (10), 2% (10), 1000 ppm (3, 5, 180, 1800), 10000 ppm (3, 180, 1800)	Yes	Good	Most extensively studied. Can cause ocular irritation, or oropharyngeal, esophageal, and gastric burns. Can corrode metals at concentrations > 500 ppm.	Abdolrasouli et al., 2017; Biswal et al., 2017; Cadnum et al., 2017b; Moore et al., 2017
Hydrogen peroxide	8 g/m ³ (?), 1.4% (1)	Yes	Moderate		Abdolrasouli et al., 2017; Cadnum et al., 2017b
Hydrogen peroxide+silver nitrate	11% (60)	Yes	Low		Biswal et al., 2017
Phenolics	5% (?)	Yes	Low	Not FDA-approved for use as high-level disinfectant but can be used to preclean before terminal sterilization.	Biswal et al., 2017
Glutaraldehyde	2% (20)	Yes	Low	Expensive and toxic. Should be used for medical equipment cleaning.	Biswal et al., 2017
Alcohols	29.4% (0.5)	Yes	Low	Difficult to achieve prolonged contact time due to rapid evaporation. Flammable. May harden rubber and certain plastic tubing after prolonged and repeated use.	Cadnum et al., 2017b
Acetic acid	>5% (3)	No	Low		Cadnum et al., 2017b
Peracetic acid	2000 ppm (5, 10)	Yes	Low	For medical equipment cleaning. Can corrode certain metals.	Kean et al., 2018
Peracetic acid+hydrogen peroxide+acetic acid	1200 ppmV <1% (3)	Yes	Low		Cadnum et al., 2017b
Quaternary ammonium compounds	2% didecylmethyl ammonium chloride (60), alkyl dimethyl ammonium chlorides (10), didecylmethyl ammonium chloride/dimethylbenzyl ammonium chloride (10)	No	Low		Biswal et al., 2017; Cadnum et al., 2017b

C. auris

Ku et al.

Review of Disinfectants Against *Candida auris*

TABLE 3 | Antiseptics tested against *C. auris*.

Disinfectant	Concentrations tested (contact time in minutes used)	Effective	Level of Evidence	Comments	Reference
Chlorhexidine gluconate	<0.02% (1440), 0.5% (0.5), 2% (2), 4% (3, 180, 1800)	Yes	Good	Most studied antiseptic. Limited clinical evaluation.	Schelenz et al., 2016; Abdolrasouli et al., 2017; Moore et al., 2017; Cheny et al., 2017
Chlorhexidine gluconate in isopropyl alcohol	2%/70% (2)	Yes	Low	<i>In vitro</i> testing only.	Moore et al., 2017
Povidone-iodine	10% (2, 3, 180, 1800)	Yes	Moderate	<i>In vitro</i> testing only.	Abdolrasouli et al., 2017; Moore et al., 2017;
Alcohol	70%	Yes	Low	Limited clinical evaluation.	Biswal et al., 2017

Conclusão da *Candida auris*



One Yeast You'd Better Avoid!

Conclusão da Candida auris

- Fungo emergente !
- Infecções com alta mortalidade
- Difícil tratamento
- Difícil diagnóstico
- Infecção persistente de difícil erradicação

- Formação de biofilme
- Colonizam pele e ambientes
- Transmissão hospitalar

Obrigada !!

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Iamspe

