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Candida auris in an Australian health care facility: importance of screening high risk patients

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Candida auris in an Australian health care facility: importance of screening high risk patients

Clinical record

A 70-year-old man with multiple myeloma was admitted to our hospital in 2018, having been hospitalised 10 months previously in the United Kingdom. Following admission to our facility, routine collection of clinical specimens was performed in the setting of an episode of febrile neutropenia. *Candida auris* was isolated in a urine specimen collected in the presence of an indwelling urinary catheter, without accompanying pyuria.

Screening of ward contacts ($n = 73$) was subsequently performed by collection of composite axilla and groin skin swabs, together with swabbing of possible clinical sites of infection (eg, wounds, catheter sites). Swabs were plated onto *Candida* chromogenic agar and incubated aerobically for 48 hours at 35°C. Any colonies not typical for *C. albicans* or *C. tropicalis* were identified using matrix-assisted laser desorption ionisation time-of-flight (MALDI-TOF) mass spectrometry. The routine regimen of daily cleaning and disinfection of rooms with 1000 ppm sodium hypochlorite solution was continued. Enhanced infection control measures, including contact precautions and single-room isolation were instituted. A multidisciplinary taskforce coordinated screening, laboratory and prevention strategies. Review of laboratory reports for the preceding 12 months confirmed this to be the first documented *C. auris* isolate at our facility.

One ward contact, a 38-year-old man with diffuse large B cell lymphoma, was identified as colonised with *C. auris*. The organism was detected in a urine specimen collected in the presence of a long term indwelling urinary catheter. This patient had been admitted to a health care facility in the United Arab Emirates, before direct transfer to our facility about 3 months earlier.

Colonised patients had been located in a common ward for 19 days, each in a single room with dedicated bathroom and patient care equipment. They had also been managed on an outlying ward for brief periods (3 and 2 days, respectively) separated in time by 2 days. Neither patient developed clinical features of urinary tract or disseminated *C. auris* infection and antifungal therapy was not administered.

Isolates were confirmed as *C. auris* by MALDI-TOF mass spectrometry (each with score of 1.75). Antifungal susceptibility testing by broth microdilution demonstrated isolates were resistant to fluconazole (minimum inhibitory concentration [MIC] > 256 mg/L) and susceptible to caspofungin (MIC, 0.25 mg/L) and anidulafungin (MIC, 0.12 mg/L for Patient 1 and 0.25 mg/L for Patient 2). To investigate relatedness of isolates, whole genome sequencing and bioinformatics analysis were performed. Phylogeographic analysis demonstrated that both were related globally to those contained

in the India–Pakistan clade. The median pairwise single nucleotide polymorphism distance between the two isolates was 167, suggesting that while these isolates were related, it was not possible to confirm whether transmission had occurred.

Discussion

Candida auris is an emerging, drug-resistant yeast, responsible for hospital outbreaks internationally.[1] First recognised as a new species of *Candida* in 2009, cases have been reported in over 30 countries, including the United Kingdom and United Arab Emirates.[1,2] In outbreak settings, bloodstream, urinary tract and deep tissue infections have been reported, in addition to colonisation. The majority of isolates are fluconazole resistant,[3] with variable resistance to amphotericin B and the echinocandin class of antifungal agents. Infection is associated with a crude mortality of 30%.[3] Key differences between *Candida albicans* (the most frequently identified *Candida* species in Australia) and *C. auris* are summarised in the Box.

Risks for *C. auris* acquisition include admission to a high dependency unit, presence of invasive medical devices, underlying immunocompromise or chronic disease and receipt of antibiotic or antifungal agents.[4] One case of *C. auris* invasive disease has previously been reported in Australia,[5] but to our knowledge the two cases identified at our facility represent the first possible transmission of *C. auris* in Australia.

Identification of *C. auris* is challenging, with potential misidentification by routine biochemical methods. If *C. auris* is included in the reference profile database, MALDI-TOF mass spectrometry may be used to confirm diagnosis. DNA sequencing also provides confirmation, together with data regarding origins and potential transmission in health care settings.[3]

Collection of bilateral axilla and groin skin swabs as a combined screening specimen is recommended for optimal yield.[6] European and United States guidelines recommend screening of all room contacts of patients with *C. auris*.[6,7] Screening of additional patients (eg, whole ward) is necessary where more than one case is identified. Targeted surveillance of patients who have recently had at least one overnight stay in an overseas facility is also recommended, especially if from a country reporting *C. auris* cases.[6,7] Our experience highlights the importance of this strategy.

Clinicians should be aware of risks for *C. auris* acquisition, including overseas health care encounters. In high risk settings, and where a case of *C. auris* infection has been identified, timely screening of patients is required to ensure that appropriate control measures are instituted.

Lessons from practice

- *Candida auris* is an emerging drug-resistant yeast, now reported in Australian health care facilities.

- In contrast to *C. albicans*, which is commonly isolated in community and health care settings, *C. auris* is generally only identified in high risk hospitalised populations. Risks for acquisition include intensive care or high dependency unit admission, presence of invasive medical devices, underlying immunocompromise or chronic disease, and receipt of broad spectrum antibiotics or antifungal agents.
- Strict infection control measures, including contact precautions and isolation, are required to reduce risks of transmission. Screening for colonisation is an important element of infection control strategies, and a composite skin swab of axilla and groin is recommended.
- Timely detection requires laboratory identification. MALDI-TOF mass spectrometry may be used for confirmation, and whole genome sequencing may provide additional information on possible transmission events.
- Health care facilities must ensure processes are implemented for screening of patients who have received health care in overseas hospitals.

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[Box]

Comparison of clinical and epidemiological characteristics of *Candida albicans* and *Candida auris*

	Candida albicans	*Candida auris*
Colonisation	Colonisation of patients in community and health care settings is common; a commensal of skin and gut of immunocompetent and immunocompromised hosts	Colonisation of patients associated only with hospital outbreaks or transmission, also identified in environment and equipment in hospital outbreak settings
Infection	Infection most frequently at mucosal sites (eg, oropharyngeal, vulvovaginal); bloodstream and urinary tract infections less frequent	Bloodstream, urinary tract and wound infections reported
Risks for infection	ICU or HDU admission, invasive medical devices, major abdominal surgery, solid tumours, haematological malignancies, broad spectrum antibiotics	ICU or HDU admission, invasive medical devices, underlying immunocompromise or chronic disease (eg, diabetes, chronic lung disease, renal failure, cardiovascular disease, or malignancy), broad spectrum antibiotics or antifungal agents
Geographical distribution	Ubiquitous, community and health care settings	Reported only in health care settings, expanding global distribution
Laboratory identification	Culture using selective chromogenic media	Culture together with MALDI-TOF or DNA sequencing
Antifungal resistance	Generally susceptible to fluconazole	Resistance to fluconazole is likely*

HDU = high dependency unit; ICU = intensive care unit; MALDI-TOF = matrix-assisted laser desorption/ionisation time-of-flight mass spectrometer. * Note: agreed fluconazole minimum inhibitory concentration breakpoints for *C. auris* have not been established