MULTIDRUG-RESISTANT CANDIDA AURIS: TOOLS AND RESOURCES THAT ARE AVAILABLE FOR IDENTIFICATION AND DETECTION

Yehorova Svitlana,
Ph.D., Associate Professor
Department of microbiology, virology, immunology,
epidemiology and Biomedical physics and informatics,
Dnipro State Medical University

Candida auris is a relatively new species of fungi, first identified in 2009, that has quickly spread across the world [1]. Fungi of the genus *Candida* belong to the division *Ascomycota*, order *Saccharomycetaleses*, family *Saccharomycetaceae*. More than 150 species of *Candida* fungi are known, more than 20 species are of medical importance. There are features that make *C. auris* unique from other species of *Candida*: antifungal resistance is the norm for *C. auris* rather than the exception, rather than primarily colonizing the gut, *C. auris* colonizes the skin, anterior nares, and other body sites of asymptomatic carriers, and *C. auris* is transmitted easily between patients in health care settings [2]. A large percentage of isolates are resistant to at least one commonly used antifungal drug. Antimicrobial resistance is one of the greatest global health challenges today. Prompt identification of individuals infected with *C. auris* is critical for guiding infection control measures, including isolation precautions and disinfection of their surroundings to prevent spread.

Many commercial identification platforms use biochemical assimilation and fermentation patterns to identify microorganisms. This poses a problem for the identification of *C. auris*, as the assimilation and fermentation patterns are similar to those of other species of *Candida*. As *C. aurus* was a new species and was not represented in the databases, initial attempts to identify it based on matrix-assisted laser desorption ionization–time of flight mass spectrometry (MALDI-TOF MS) were unsuccessful. Following the continual isolation and spread of *C. auris* across many countries, the commercial manufacturers of MALDI-TOF MS added it to their databases. Isolates from all four of the major *C. auris* clades can now be correctly identified with the Vitek MS system (bioMérieux, Durham, NC) [3].

Chromogenic medium has been a staple diagnostic tool for *Candida* species identification for a few decades. *Candida spp.* are identified based on colony color. But most chromogenic medium are not capable of reliably distinguishing *C. auris*, as colonies can appear cream, pink, red, or purple and resemble the other species. New chromogenic media have been developed for the additional identification of *C. auris*, CHROMagar Candida plus (CHROMagar, France) and HiCrome C. auris MDR selective agar (HiMedia, Mumbai, India). When tested side by side against 49 *Candida* isolates including representatives from all four major *C. auris* clades, only CHROMagar Candida plus correctly distinguished all the *C. auris* isolates. However, with CHROMagar Candida plus, there were false-positive identifications with the

closely related species *Candida vulturna* and *Candida pseudohaemulonii*. For this reason, colonies suspected of being *C. auris* by using colony color on chromogenic media should be further confirmed by sequencing or MALDI-TOF MS [4].

When *C. auris* first started to appear in clinical microbiology laboratories, it could be identified only by using DNA sequencing. In the decade since its first identification, there have been many improvements in the detection of *C. auris*. These include the expansion of matrix-assisted laser desorption ionization–time of flight mass spectrometry (MALDI-TOF MS) databases to include *C. auris*, the development of both laboratory-developed tests and commercially available kits for its detection, and special CHROMagar for identification from laboratory specimens [5].

References:

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