

Proceeding Paper

Candida spp. Colonization among Intensive Care Unit Patients, Preliminary Results †

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Abstract: *Candida* spp. colonization is recognized as a major risk factor for invasive candidiasis. To assess patient colonization, upon admission and during their stay in intensive care units (ICU), a surveillance study has been conducted since January 2020, in the Lisbon area of Portugal. A total of 219 swab samples were obtained from 113 ICU patients. The yeast identification was conducted by microbiological conventional and molecular methods. Upon admission to the ICU, 27% of patients were already colonized, and 17% became colonized during their ICU stay. *Candida albicans* was the most isolated species. These results may offer an opportunity for prevention of candidemia.

Keywords: yeasts; surveillance; colonization; identification; *Candida* spp.



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1. Introduction

Candida is the most common genus of commensal fungi present in different mycobiomes [1]. These yeasts are commensal in healthy humans and can cause systemic infection in situations where the host is immunocompromised. Of these, previous *Candida* spp. colonization stands out as the main predisposing factor for infection [2]. Colonized patients may also constitute reservoirs of species that are multidrug-resistant to antifungal drugs and that enhance horizontal transmission [2]. The literature on mycological epidemiological data in the intensive care unit (ICU) setting in Portugal is scarce. The aim of this work is to assess patients with *Candida* spp. colonization in an ICU environment.

2. Materials and Methods

To examine the presence of *Candida* spp., an ongoing surveillance study has been conducted since January 2020 in the ICUs of a tertiary hospital, Prof. Doutor Fernando Fonseca Hospital (HFF), in the Lisbon area of Portugal. The research has been conducted upon the admission of patients to the ICU and continues for the duration of stay (5 and 8 days). As a measure of the hospital control infection practice, chlorhexidine baths were taken during the swab collection time. Inclusion criteria include at least three risk factors for *Candida* spp. colonization/infection. All patients under the age of 18, pregnant women, and mentally disabled individuals were not included in the study. The sampling of each patient was performed by a non-invasive procedure using an axillary/inguinal combine swab. Identification of isolates was determined at a species level based on microbiological conventional and molecular methods.

3. Results and Discussion

A total of 219 composite axilla and inguinal swabs were obtained from 113 ICU patients. A total of 113 samples were collected on admission day, and 106 were collected during the time that the patients were in the ICU: 76 on 5th day and 30 on 8th day of ICU stay.

Of the 219 samples collected, 71 (32%) yielded *Candida* species. The most commonly recovered species were the *Candida albicans* (49%), *Candida parapsilosis* (34%), and *Candida glabrata* complexes (8%). No emerging rare species, such as *Candida auris*, were detected. Upon admission to the ICU, 27% (31/113) of the patients were already colonized with yeasts, and 17% (18/106) became colonized after admission. During their ICU stay, 38% (40/106) of patients were colonized, even after two chlorhexidine baths. Persistent colonization occurred in 27% (8/30) of patients who had three collections performed; in 50% of them, colonization persisted with *C. albicans*. High colonization ($>10^3$ CFU/mL) was shown in 18% of patients (20/113) at ICU admission. A colonization reduction was observed in only in 7% (2/30) of patients with an 8-day stay in the ICU.

Results from samples yielding *Candida* were consistent with the observations of other investigators, but we found lower rates upon admission [3]. Available studies in Portugal have focused on *Candida* spp. isolates in blood cultures [4,5]. The investigators also showed a prevalence of *C. albicans* but evidenced a change in the distribution of the isolated *Candida* species, with an increase in the proportion of *C. glabrata* [4]. This was not observed in our preliminary results. This study is the first attempt to systematically characterize the extent of *Candida* spp. colonization in ICU patients in Portugal. It may be necessary to conduct a nationally representative study of *Candida* spp. prevalence in the ICU, which can be guided by experience from this pilot.

Institutional Review Board Statement: Approved by Institutional Ethical Board of the Prof. Doutor Fernando Fonseca Hospital on 13/11/2019 (54/2019).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

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Conflicts of Interest: The authors declare no conflict of interest.

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