Widespread Colonization by the *Candida parapsilosis species complex* in Spanish Critical Care Units

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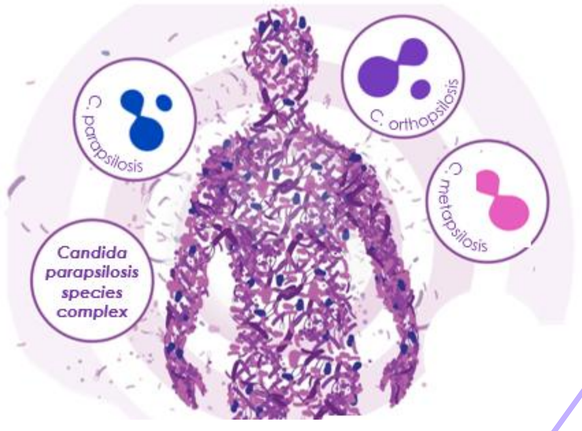
INTRODUCTION

The *Candida parapsilosis species complex* (including *C. parapsilosis sensu stricto, C. orthopsilosis* and *C. metapsilosis*) is a frequent colonizer of human tissues and a notable cause of nosocomial infections. *C. parapsilosis* typically shows reduced susceptibility to echinocandins but remains sensitive to azoles and polyenes. However, recent years have seen increasing reports of azole-resistant *C. parapsilosis* outbreaks in Spain.

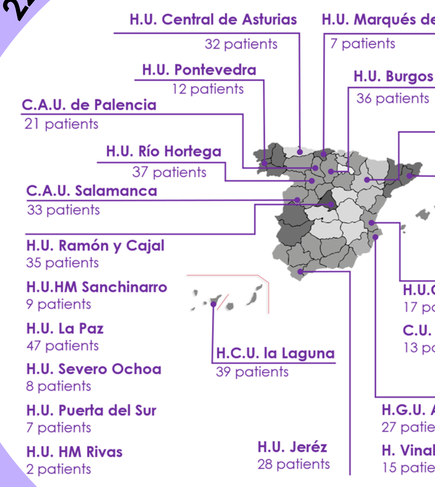


AIM

To assess the prevalence, antifungal susceptibility, and resistance mechanisms of *Candida parapsilosis species complex* colonization in ICU patients across Spanish hospitals, with emphasis on azole-resistant strains and outbreak detection.

CONTACT

22 ICUs in Spain, including 490 patients



METHODS

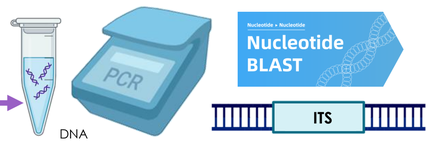
1 SAMPLE COLLECTION

- Skin swab
- Aspirate (intubated) or oral swab

2 CULTURE & ISOLATION OF STRAINS

30°C for at least a week

3 IDENTIFICATION OF ISOLATES

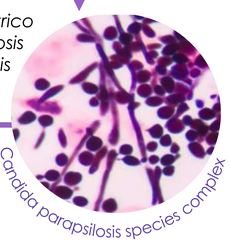


3 SUSCEPTIBILITY TESTING

EUCAST 9.4

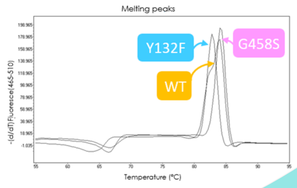
Fluconazole
Itraconazole
Posaconazole
Voriconazole
Isavuconazole
Amphotericin B
Caspofungin
Micafungin
Anidulafungin

C. parapsilosis sensu strico
C. orthopsilosis
C. metapsilois



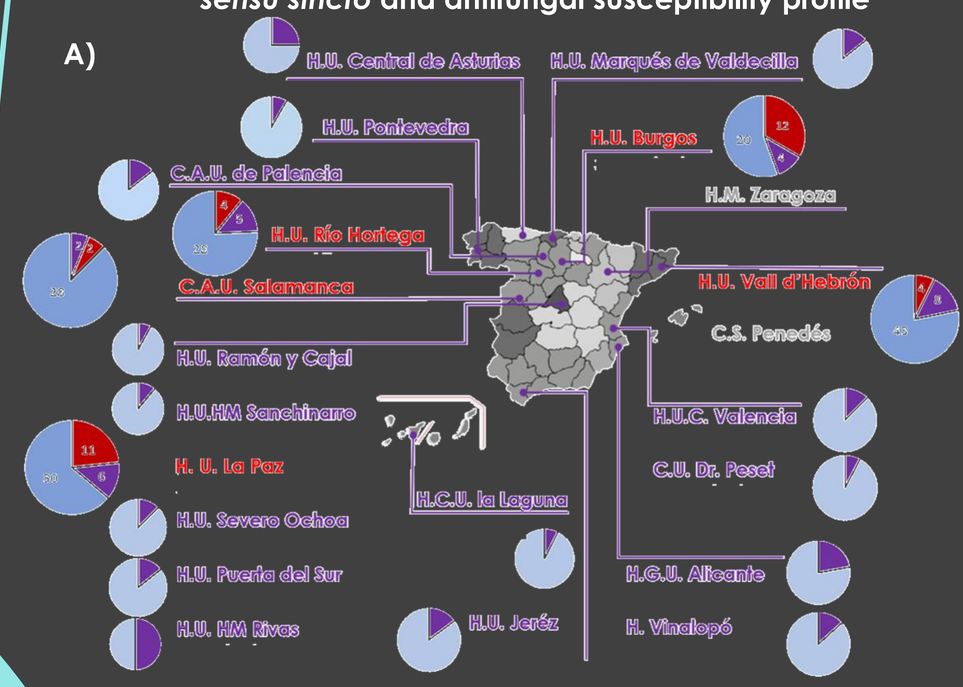
4 RESISTANCE MECHANISMS OF AZOLE-RESISTANT ISOLATES

Duplex real-time PCR or conventional PCR to detect ERG11 mutations



RESULTS

Patients admitted to ICUs colonized by *C. parapsilosis sensu stricto* and antifungal susceptibility profile



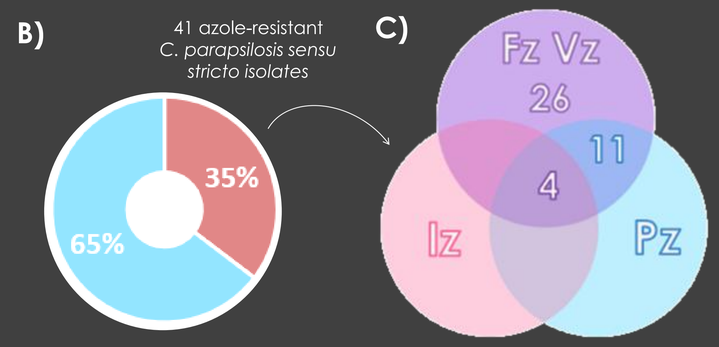


Figure 1. A) Map showing the location of the ICUs in the study. For each ICU, patients not colonized by *C. parapsilosis sensu stricto* are shown in blue, those colonized by azole-susceptible *C. parapsilosis sensu stricto* are shown in purple, and those colonized by azole-resistant *C. parapsilosis sensu stricto* are shown in red.
B) Percentage of C. parapsilosis *sensu stricto* isolates susceptible to azoles in blue and resistant to azoles in red.
C) Number of isolates resistant to azoles: fluconazole (Fz), voriconazole (Vz), posaconazole (Pz), and itraconazole (Iz).

C. parapsilosis sensu stricto isolates from hospitals that have reported outbreaks

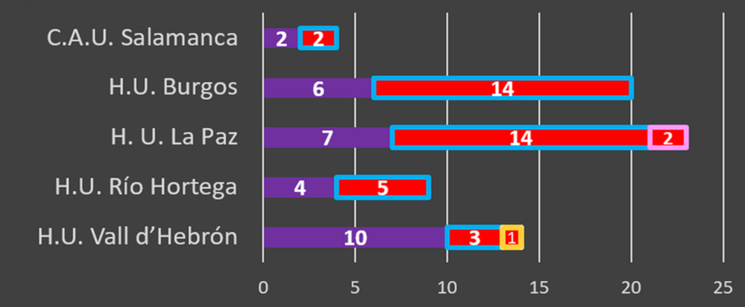


Figure 2. Isolates susceptible to azoles in purple and resistant in red. Resistant isolates with the Y132F mutation highlighted in blue, the G458S mutation in pink, and WT in yellow.

Patients admitted to ICUs colonized by *C. orthopsilosis and C. metapsilosis* and antifungal susceptibility profile

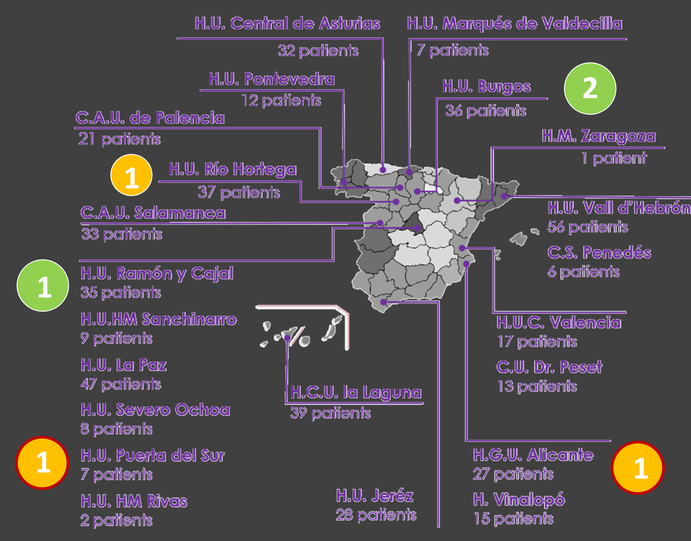


Figure 3. Map showing the location of the ICUs included in the study and the isolates of *C. orthopsilosis* (yellow) and *C. metapsilosis* (green) identified colonising patients). Resistant isolates with the K143R mutation highlighted in red.

CONCLUSIONS

1. *Candida parapsilosis complex* is identified as a prevalent colonizer in patients admitted to intensive ICUs in Spain, affecting approximately 20% of hospitalized patients.

2. 35% of *C. parapsilosis sensu stricto* isolates studied are resistant to azole antifungals. These strains were detected only in a small subset of hospitals (5 out of 22) suggesting that their presence may be linked to localized outbreak situations.

3. The main resistance mechanism identified in the *C. parapsilosis sensu stricto* isolate is the Y132F mutation in the Erg11 protein. A less common mutation is G458S, however, it is clinically relevant as it is associated with cases of pan-resistance to azoles.

4. The prevalence of colonization by *C. metapsilosis* and *C. orthopsilosis* is much lower than that of *C. parapsilosis*. The K143R mutation in the Erg11 protein was the sole mechanism associated with the observed Azole resistance in *C. orthopsilosis,* the presence of antifungal-resistant isolates of *C. orthopsilosis* must be monitored.

5. **The presence of resistant strains of *C. parapsilosis complex* in ICUs in the health system highlights the need to understand their prevalence and establish control mechanisms, as they represent a considerable challenge in the management of these infections.**

SHARING IS ENCOURAGED

Antimicrobial Chemotherapy Conference