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ORIGINAL ARTICLE/ARTICLE ORIGINAL

Study of strains of *Candida* spp. Isolated from catheters in UHC of Oran (Algeria): Identification and antifungal susceptibility

Étude de souches de Candida *spp., isolées de cathéters au CHU d'Oran-Algérie : identification et sensibilité aux antifongiques*

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Candida spp.;
Catheters;
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Summary
Objectives. — The increasing incidence of *Candida* spp., and the vital prognosis often compromise for patients with *Candida* species make urgent the exact knowledge of their distribution worldwide and exhaust action antifungals currently used in clinical. That why we carry out an epidemiological study of *Candida* species and testing their susceptibility against two antifungals: amphotericin B and caspofungin.
Materials and methods. — Samplings of peripheral venous catheters (PVC) were carried out from during 8 months on the services of Internal medicine, Surgery A and Neonatology of Oran's University Hospital Center (UHC). The study of the susceptibility of *Candida* species to antifungal agents was performed according to the Clinical Laboratory Standards Institute (CLSI 2008).
Results. — From 300 samples, 25 yeasts were isolated. The rate of colonization PVC was 8.33% by *Candida* spp. The most isolated strains were *Candida parapsilosis* with 64% of cases, followed by *Candida albicans* (12%) then 8% for *Candida glabrata* and *Candida krusei*. However, only 4% of isolates were *Candida famata* or *Candida lusitaniae*. Furthermore all isolated strains were susceptible to amphotericin B with Minimum Inhibitory Concentrations (MIC) ranging from 0.25 to 1 μg/mL. MIC obtained with caspofungin vary from 0.0625 to 2 μg/mL for all strains. Moreover, one strain of *C. krusei* is resistant to caspofungin with a MIC superior to 8 μg/mL.

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Conclusion. — All though caspofungin is at least as effective as amphotericin B, it is better tolerated for the treatment of invasive fungal infections.

MOTS CLÉS
Candida spp. ;
Cathéters ;
Amphotéricine B ;
Caspofungine ;
Infections nosocomiales

Résumé
Objectifs. — L'incidence croissante de *Candida* spp. et le pronostic vital souvent compromis pour les patients atteints de septicémie à *Candida* rendent urgente la connaissance exacte de leur distribution à travers le monde et les mécanismes par lesquels ils échappent à l'action des antifongiques actuellement utilisés en clinique. Pour cela, nous nous sommes proposés de réaliser une étude épidémiologique des espèces de *Candida* et tester leur sensibilité vis-à-vis de deux antifongiques : l'amphotéricine B et la caspofungine.
Matériel et méthodes. — Les prélèvements cliniques des pièces de cathéters veineux périphériques ont été effectués pendant 8 mois aux services de médecine interne, chirurgie A et néonatologie du centre hospitalo-universitaire d'Oran (CHU). L'étude de la sensibilité des espèces de *Candida* aux antifongiques utilisés a été réalisée selon la méthode décrite en 2008 par Clinical Laboratory Standards Institute (CLSI 2008).
Résultats. — Parmi les 300 prélèvements réalisés, 25 cathéters vasculaires étaient contaminés, soit un taux de 8,33 %. Les souches les plus isolées étaient *Candida parapsilosis* avec 64 % des cas, suivi par *Candida albicans* 12 %, puis 8 % pour *Candida glabrata* et *Candida k (krusei)*. Cependant, seulement 4 % des isolats étaient *Candida famata* ou *Candida lusitaniae*. En outre, toutes les souches isolées étaient sensibles à l'amphotéricine B avec des concentrations minimales inhibitrices (CMI) comprises entre 0,125 et 1 μg/mL. Les CMI obtenues vis-à-vis de la caspofungine varient de 0,0625 à 2 μg/mL pour toutes les souches. De plus, une souche de *C. krusei* est résistante à la caspofungine avec une CMI supérieure à 8 μg/mL.
Conclusion. — Quoique la caspofungine soit au moins aussi efficace aussi que l'amphotéricine B, elle est mieux tolérée pour le traitement des infections fongiques invasives.

Introduction

The advancement of medical and surgical practices are considerably improved the survival of profoundly immunosuppressed patients who are exposed to a significant risk of opportunistic infections such as fungal infections, usually severe in these patients whose diagnosis and treatment are difficult [12].

Candida spp. are the most frequently responsible for invasive fungal infections, today, effectively, candidemia represent 5—10% of sepsis largely involved with *Candida albicans* [16,23,34]. However, an increase in the proportion of candidemia due to *Candida non-albicans* speciesis observed, such as *Candida glabrata*, *Candida krusei* and *Candida parapsilosis* which represent 35—65% of isolates [2,4,36].

Candida infections related to the use of vascular catheters are the consequences of their extraluminal colonization from the skin (normal skin flora or secondary skin colonization in curred during hospitalization), or a hematogenous seeding of the vascular lumen of the catheter during fungemia [21].

Although a number of antifungal agents may be used for prevention [17], candidemia's diagnosis of the vascular catheter is difficult to prove before its removal [14].

Materials and methods

Sampling, isolation and identification of isolates

Samplings of peripheral venous catheters (PVC) were carried out from 8 months on the services of internal medicine, surgery A and neonatology of Oran's University Hospital Center.

The catheters were removed from patients and then cut (under aseptic conditions) using a sterile scalpel and placed directly in tubes containing a sterile Sabouraud medium. The catheters were then stirred for one minute according Brun-Buisson et al. [7].

The samples were incubated at 37 °C for 24 to 48 hours. The collected isolates were identified in the laboratory (Antibiotics Antifungals: physical-chemistry, Synthesis and Biological activity).

Identification of isolates was based on morphological and physiological aspects: germ-tube test (filamentation on serum), formation of chlamydospores, Api Candida (bioMerieux®, Marcy l'Etoile, France).

Antifungal susceptibility testing

Determination of the Minimum Inhibitory Concentration (MIC)

The M27-A3 and M27-S3 CLSI methods were used to evaluate antifungal susceptibility [9,10].

The principle of thismethodis to evaluate the ability of yeasts to produce visible growth in the wells of microplates (96-well) which contains the liquid culture medium in the presence of increasing concentrations of antifungal. The culture medium used for this technique is the broth Roswell Park Memorial Institute (RPMI-1640) buffered to pH 7 ± 0.1 with 0.165 M Morpholinepropane-sulfonic Acid (MOPS).