**Candida Species Carriage in Diabetic Patients in Misrata, Libya**

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### Abstract

**Background:** There is a paucity of studies describing the prevalence and antimicrobial profiles of Candida in Libya. Limited treatment choices in the antifungal armamentarium in public healthcare settings in Africa require a study of the prevalence and susceptibility of Candida species in Libya, where antifungals are not routinely prescribed in public healthcare settings.

**Methods:** In this study, 170 diabetes mellitus type 2 (T2DM) patients were examined for Candida carriage in the oral mucosa, using differential Fluka and Otsol chromogenic media and API 32 ID C biochemical testing. Fluconazole susceptibility was investigated by disk diffusion on VNBG agar. Isolates were graded as susceptible, intermediate or resistant according to their inhibition zone measurements and microcolony scores.

**Results:** Thirteen species were identified from 182 isolates with a frequency of 68 C. albicans, 42 C. dubliniensis, 26 C. glabrata, 20 C. gluabata, 5 isolates of each C. krusei, C. tropicalis and C. kefyr, 4 C. sake, 2 C. parapsilosis, 2 C. magnoliae and 1 isolate each of C. paratropicalis, C. globosa and C. membranifaciens. Although largely susceptible to fluconazole, C. albicans, C. dubliniensis, C. glaucoma and C. sake demonstrated an emerging resistance with intermediate to total resistance observed in all the other species except for C. magnoliae and C. globosa which were both susceptible to fluconazole.

**Conclusion:** Early recognition and treatment of rare or resistant Candida species which may be contributing to patient morbidity and mortality in Libya is imperative.

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### Introduction

Type 2 diabetes mellitus (T2DM), a metabolic disease that is primarily characterized by abnormal regulation of metabolism, affects over 190 million people worldwide [1,2]. T2DM patients are more vulnerable to fungal infection, particularly Candida infections of the oral cavity [3-5] due to the increased salivary glucose [6] and the heightened availability of Candida receptors in these subjects [7]. It has been established that most diabetic patients show at least one lesion or abnormality in the oral mucosa, such as angular cheilitis, fissured tongue, xerostomia and erythematous candidiasis [8].

### Aim of study

The aim of this study was to explore the prevalence, species distribution and antifungal sensitivity profile among oral cavity isolates of Candida spp. from T2DM Libyan patients.

### Material and methods

**DM type II Libyan patient selection**

Samples collected from oral mucosa of patients

Samples plated onto Sabouraud dextrose agar and incubated overnight at 37°C

**Confirmation of morphology by Gram staining**

Presumptive identification by growth on chromogenic agar

**Confirmation of ID using Vitek 2 compact system**

Antifungal susceptibility testing using disk diffusion

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### Results

The findings of this study constitute the first report on the prevalence of Candida species epidemiology in Misrata, Libya. As in other regions, C. albicans is the most prevalent among all Candida spp. as the cause of oral candidiasis in Libya. Non-albicans Candida spp., including Fluconazole-resistant C. krusei, C. gluabata, C. sake, C. tropicalis and C. glaurata were also commonly isolated.

### Conclusions

- Further attention should be given to fungal infections, by addressing the need to better understand the etiological reasons for the emergence of rare species, heightened awareness among medical and public health professionals about these infections and attention to methods that can be used to prevent and control them.
- Further investigations using molecular microbiology techniques are currently underway in our laboratories to better understand the mechanisms of drug resistance of these organisms.

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### References