

# SHORT COMMUNICATION

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## Prevalence of Common Candida Species in Oral Lichen Planus Patients: A Cross-Sectional Study in South of Iran

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### Abstract

**Background:** Lichen Planus is a common mucocutaneous disease with unknown etiology. Immunodeficiency is a known predisposing factor to this disease. Oral Candidiasis which is an opportunistic fungal infection, commonly affects healthy and immune-compromised patients. Candida has different species bearing different treatments. In this study, researchers aimed to detect the frequency and colonization rate of Candida and its association with different factors such as lesion types of oral lichen Planus (OLP). **Materials and Methods:** Thirty seven untreated oral lichen Planus patients, attending the Clinical Department of Oral Medicine at Shiraz Dental School in 2011, were selected. Swab method and CHROMagar media were used to obtain samples incubated for 48 hours at 30 °C. Fungal species were detected considering colony color changes. **Results:** In the culture test, approximately 80% of samples were positive of non-reticular type. About 40% of positive samples were of Candida non-albicans (C. Non-albicans) type. Among C. Non-albicans, 85% were non-reticular type among OLP patients. There was no significant statistical difference in prevalence of Candida albicans (C. albicans) and C. Non-albicans in OLP patients. **Conclusion:** Based on results, certain biotypes of Candida were not confirmed responsible for OLP patterns. [GMJ.2014;3(4):252-5]

**Key Words:** Candida Albicans; Lichen Planus; Oral Mucosa; Etiology; Prevalence; Biotype

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### Introduction

Lichen Planus is a common chronic inflammatory disease of unknown etiology which usually affects oral mucosa with a variety of clinical patterns including reticular, papular, plaque-like keratoses, atrophic sur-

face, erosive or bullous lesions [1-3]. There is a positive correlation between oral lichen Planus (OLP) and malignancies, namely Epidermoid Carcinoma [4,5]. Besides, various factors including immunologic imbalances, genetics and also infection with C. albicans are suggested as predisposing factors of the

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disease [6-8]. Most important virulent Candida species in Candidiasis are *C.albicans*, *C.glabrata*, *C.guilliermondii*, *C.stellatoidea*, *C.krusei*, *C.parapsilosis*, *C.tropicalis*, and *C.lusitaniae* [9]. Despite several similarities to *C.albicans*, *C.dubliniensis* has been identified as a non-*Candida albicans* Candida species [10]. Among Candida species, *C.albicans* plays the most important role in the pathogenesis of OLP. However, the relationship between *C.Non-albicans* and OLP is unknown. There are only a few studies evaluating the prevalence of Candida species, notably the newly identified *C.dubliniensis*, in OLP patients [2,8,11-13]. In addition, to the best of our knowledge, there is currently no published research assessing the relation of the Candida species to the pattern of OLP lesions. Considering the fact that various species of Candida respond differently to treatment and patients with OLP may be infected by a variety of Candida species, this study was aimed at evaluating the prevalence of oral Candidiasis, the species distribution in OLP patients and their association with different factors such as patterns of OLP lesions.

### Materials and Methods

In this cross-sectional study, Candida samples were obtained from OLP patients, diagnosed on the basis of clinical features by a specialist attending Clinical Department of Oral Medicine, Shiraz Dental School of Shiraz University of Medical Sciences, Iran during 2011. Using simple sampling method for 37 OLP patients, who had no history of Corticosteroid or antifungal therapy for at least one month, were studied in two groups with either reticular or non-reticular pattern. Samples, taken with sterile swabs, were streaked onto CHROMagar (CHROMagar Candida, Karamad Teb Company) culture media and then incubated at 30 °C for 24-48 hours. Positive samples were passaged and kept at 20 °C sterile aquapura. Candida species can be discerned in the presence of chromogenic materials on the basis of their specific colony colors which is compared to the recommended color pattern of media [14]. The sensitivity of CHROMagar test is 99.4-100% for *C.albicans* and 90.9-100% for non *C.albicans* species. The specificity of the

test is 100% [15]. Among Candida species, both *C.albicans* and *C.dubliniensis* can produce germ tubes [16]; hence, in order to confirm the results with germ tube method, specimens of the yeast colony were added to a 0.5 ml test tube containing human serum which was then kept in 37 °C steam bath for 1.5-2 hours. Microscopic observation of Blastospore originated cylindrical germ tubes, which are 2.5 folds in size compared to a yeast cell width, was considered as a discriminating criterion for the germ tube test [17]. An informed written consent was obtained from each participant in this study. All the procedures of the study were approved by the Ethics Committee of Shiraz University of Medical Sciences. Fishers' Exact Test and SPSS software (Version 16) were used for statistical analysis of data.

### Results

In the present study, samples were obtained from 37 OLP patients (28 females, 75% and 9 males, 25%) who had no history of previous medication. Candida culture was positive in 18 patients (49%). Mean age of patients was 50.45 (minimum at 25 and maximum at 78). Twenty five patients (68%) had non-reticular type and 12 had reticular pattern. Among 24 non-reticular patients, the culture was positive in 16 (74%) cases, and only four of 12 patients (33%) with reticular pattern had positive culture test. Fishers' Exact Test revealed that the proportion of *C.albicans* prevalence did not correlate with either two OLP types or the disease itself in a statistically significant way ( $P=0.52$ ) (Table-1). Moreover, association of sex and type of Candida showed no statistically significant difference ( $p=0.6$ ) (Table-2). Results from germ tube test indicated that 5% of samples were *C.Non-albicans* and the 95% were *C.albicans*.

### Discussion

Regarding the burden put on health care systems by OLP clinical management, researches casting light on the contributing factors to this disease, namely presence of pathogenic microorganisms, seem to be very invaluable [18].

**Table 1.** Prevalence of Candida Species Regarding Patterns of Oral Lichen Planus Lesions

	Reticular		Non-Reticular		Total	
	Number	Percent	Number	Percent	Number	Percent
<b>C.Non -albicans</b>	1	5%	6	32%	7	37%
<b>C.albicans</b>	3	16%	9	47%	12	63%
<b>Total</b>	4	21%	15	79%	19*	100%

\* As one of the 18 patients with positive culture test had both C.albicans and C.Non-albicans, 19 samples are included in the results.

**Table 2.** Prevalence of Candida Species Regarding Patients' Sex

	Men		Women		Total	
	Number	Percent	Number	Percent	Number	Percent
<b>C.Non-albicans</b>	3	16%	4	21%	7	37%
<b>C.albicans</b>	4	21%	8	42%	12	63%
<b>Total</b>	7	37%	12	63%	19	100%

Alternations of opportunistic Candida species in oral mucosa and fungal super-infection, a result of debilitated immune system due to OLP steroid therapy, may aggravate patients' conditions [19]. As an example, in HIV+ patients, common Candida species switch from C.albicans to C.glabrata and C.krusei which subsequently necessitate the use of Fluconazole instead of Nystatin in the treatment protocol [20]. Zeng et al. investigation of genotypic profiles and virulence attributes of isolated C.albicans strains from OLP patients and healthy controls revealed certain genotypes which had statistically significant association with disease condition and thus might contribute to the pathogenesis of OLP [2]. Another study, resulting from detection and identification of C.Non-albicans species, has supported the idea that patients with OLP are more likely to develop Candida colonization than individuals with healthy oral mucosa, and that non-C.albicans species are specifically present in subjects affected by OLP particularly those with OLP and diabetes [11]. However, in an assessment of the relation between erosive lichen Planus and Candida species, authors did not confirm C.albicans as an etiologic factor for OLP, given that there was no

remarkable difference between OLP patients and healthy individuals [12]. In this study, diagnosis of all samples was based on culture method; however, in a recent publication by Kragelund et al, both culture test and lesional cytobrush sampling were used. Since the latter method was more sensitive in detecting non-albicans species, it was concluded that the use of a single test may not be decisive in diagnosis and treatment of OLP patients with oral candidiasis [13].

### Conclusion

Although results indicated no significant correlation between types of OLP and Candidiasis, the diversity of Candida species highlights the importance of correct identification of infectious species in improving the therapeutic management of patients' conditions. Authors suggest that further investigations using multiple tests with high precision, such as DNA analysis, are required to elucidate the exact role of different Candida species in progression of OLP.

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