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Isolation and Identification of Thrush Disease in Human

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Abstract

Background: Candidiasis is the most frequent fungal infection in the oral cavity of human. As a result, they have the potential to trigger an opportunistic infection known as oral Candidiasis. A high percentage of healthy persons have commensals Candida in their oral cavity with or without signs or symptoms of Candidiasis. Candida overgrowth is enhanced by many predisposing factors such as immunological status of the patient, heredity, and malignant tumors. The purpose of this study was to isolate *Candida albicans* from oral candidiasis patients by using Sabouraud's Dextrose agar medium and performing preliminary differentiating of *Candida albicans* and other yeasts according to NICKERSON and its connection with oral mucosal diseases. Fifty samples of infected human (male) with clinically confirmed oral mucosal lesions were collected and 22 samples of human (male) with no symptoms were collected (control). *Candida* spp growth was detected using SDA in (26 out of 50) patients with a (52%) isolate from 50 (100%) samples. *Candida albicans* was diagnosed in 10 (45.5%) isolate from twenty-two sample (control group), whereas 24 (48%) were isolated from 50 sample on candida elective agar. In conclusion, *Candida albicans* was, among other *Candida* spp. that causes thrush illness in human.

Keywords: *Candida albicans*, Thrush disease, human, Oral candidiasis

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عزل وتحديد مرض القلاع في الإنسان

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الخلاصة

الخلفية العلمية: داء المبيضات هو العدوى الفطرية الأكثر شيوعا في تجويف الفم للإنسان. و لديها القدرة على إثارة عدوى انتهازية تعرف باسم داء المبيضات الفموي. هنالك نسبة عالية من الأشخاص الأصحاء الذين لديهم المبيضات الفطرية في تجويف الفم مع أو بدون علامات أو أعراض للمرض. ولكن يتم تعزيز فرط نمو المبيضات من خلال العوامل المسببة الموضعية والجهازية مثل الاختلالات المناعية والوراثة والأمراض الخبيثة وطقم الأسنان غير المناسب وتدخين السجائر. ان الغرض من هذه الدراسة هو عزل المبيضات البيضاء باستخدام وسط (Sabouraud's Dextrose Agar وإجراء التفرقة الأولية للمبيضات والخمائر الأخرى باستحدام طريقة نيكرسون(Candida elactive agar to nickerson () وعلاقته بأمراض الغشاء المخاطي للفم.الطريقة : تم جمع 50 عينة من (الذكور) مصاب بآفات مخاطية فموية مؤكدة سريريا و 22 (ذكور) بدون أعراض (مجموعة سيطرة) . تم تحليل البيانات التي تم الحصول عليها إحصائيا وتم الكشف عن نمو *Candida spp* في SDA في 26 (52٪) عزلة من 50 (100٪) عينة كذلك تم العثور على *Candida albicans* في المجموعة المصابة السيطرة وتم تشخيص 10 (45.5٪) عزلة من ال 22 عينة، وتم تشخيص 24 (48٪) عزلة من 50 عينة على أجار المبيضات الاختياري يعد مسبب *Candida albicans* أحد اسباب مرض القلاع في الإنسان من بين أنواع *Candida Spp*.

الكلمات المفتاحية: المبيضات البيض، مرض القلاع، الانسان، داء المبيضات الفموي.

Introduction

Candida is derived from the Latin word candid, which means "white." Candida spores are a commensal, harmless type of a dimorphic fungus that can become invasive ,When there is a disruption in the environment, pathogenic pseudohyphae or the host's weakness [1,2]. There are several Candida species [3] , but *C. albicans* is the most common one that recovered from the oral cavity, both commensally and in instances of oral Candidiasis. This species is thought to account for more than 80% of all oral yeast isolates. Infections caused by the opportunistic fungus Candida have received considerable attention in recent years [4]. *Candida spp.* rising relevance is linked to the rise of HIV infection and the more prevalent use of

immunosuppressive chemotherapy [5]. Identification of Candida infecting strains is critical since isolates of Candida species are range greatly in their capacity to produce infection as well as sensitivity to antifungal drugs [6]. *Candida albicans* is the most common etiological agent, however other Candida species, such as *C. tropicalis, C. dubliniensis, C. parapsilosis, C. krusei, C. guillermondii, C. glabrata,* and *C. kefyer,* can cause a wide range of illnesses. Some of these species are seen as secondary infections to other species; for example, *C. parapsilosis* is only observed as a secondary infection when *C. albicans* is the cause of Candida endocarditis [7]. Other Candida species, such as *C. catenulate, C. intermedia, C. lambica, and C. zeylanoides*, have been recovered from clinical isolates on occasion. As a result, these species are not considered agents of opportunistic illnesses [8].

Materials and methods

This study included 50 samples collected from Baquba Teaching hospital clinic from infected human (male) with white grey, thicken plaques or diphtheritic membrane may be evident in the tongue, mouth and esophagus. Samples were collected by a sterile cotton swab from oral mucosa lesions between October 2021 and February 2022 at Baqubah market. In addition to 22 clinically healthy human (did not appear any clinical signs) were chosen randomly for swabbing oral mucosa samples, with swab samples were inoculated into Sabouraud Dextrose Agar media for 24 hours at 35^{o} C, the growing yeast on inoculation plates was for Candida colonies. Candida developed in the form of white colonies on the sabouraud dextrose agar. A platinum loop was used to distribute sample material, Then the specimen was collected from the mycelial growth from sabouraud dextrose agar and placed on the surface of the medium of candida elective agar, and incubated at 35°C for 24h to 48 h till the growth appear.

Statistical Analysis

The data was analysis by using IMP SPSS statistics 20. T test was used for analyzing the data. The data was presented as mean ± SD. Significant of variance was at P value < 0.05.

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Results

Isolation of *Candida spp.* from infected human (males)

Sabouraud dextrose agar was used to isolate yeast from human oropharyngeal. *Candida spp*. Sabouraud dextrose agar culture color and colony features indicated small, spherical, white colored, and rough colonies (Figure 1).

Figure 1: *Candida spp.* from human on sabouraud dextrose agar medium

Isolation and identification of *Candidia albicans*

Candida elective agar to nickerson was used to isolate and identification of *Candida albicans* from Candida colonies on sabouraud dextrose agar. The culture medium contained brown to black, smooth colonies with a pasty look similarly colored bacterial colony (Figure 2).

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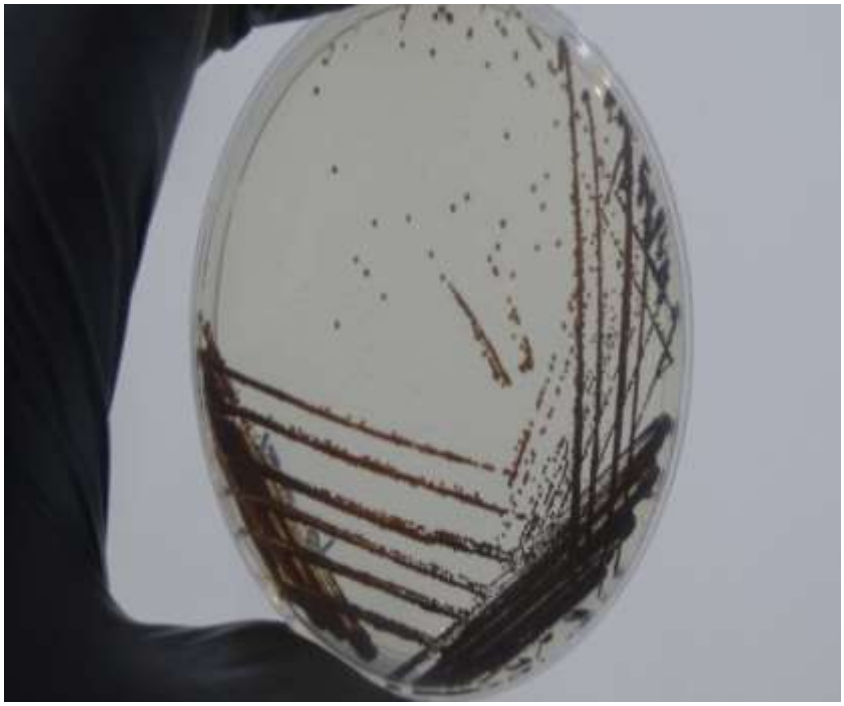

Figure 2: *Candida albicans* colony on candida elective agar to nickerson

Distribution of *Candida* spp among study groups

The Sabouraud dextrose agar result showed *Candidia* spp among research groups, 13(59.1%) was diagnosed in the control (male) isolate from 22 sample, while 26(52%) was diagnosed from infected human 50 sample (Table1).

Table 1: Shows the distribution of *Candidia spp.* among study groups

			Candida. Spp		Total
			Yes	No	
Groups	Control (males)	Count	13	9	22
		% within Groups	59.1%	40.9%	100%
	Infected human(male)	Count	26	24	50
		% within Groups	52.0%	48.0%	100%

Data was presented as case number and percentage

Distribution of *Candidia albicans* among study groups

The candida elective agar was used to diagnose *Candida albicans* in the research group. 10 (45.5%) isolates were diagnosed with Candidia albicans in the control (22 males), 24(48%) isolates were diagnosed in infected human (50 samples) (Table 2).

Table 2: Shows the distribution of *Candida albicans* among study groups

			Candid albicans		Total
			Yes	No	
Groups	Control (males)	Count	10	12	22
		% within Groups	45.5%	54.5%	100%
	Infected (human)	Count	24	26	50
		% within Groups	48%	52%	100%

Data was presented as case number and percentage

Discussion

Candida spp. are significant human pathogens [9]. Poor oral hygiene, in some instances Diabetes and immunologic abnormalities may increase the number of *Candida spp.* in the oral flora and this increase superficial and systemic fungal infections as compared to healthy individual [10,11]. *C. albicans* has the highest frequency in the oral cavity among *Candida spp.* however, in the last two decades, the prevalence of oral candidiasis with other species such as *C. glabrata and C. krusei* that are less susceptible to azole compounds has grown [12]. Sabouraud created SDA for the culture of fungus, particularly those involved with skin diseases [13]. Because of its low pH, the medium is more suitable for fungal separation than bacteria, and it also aids in identification by boosting distinctive spores and pigment formation by the fungi. The optimal medium for corneal fungal infections is SDA with chloramphenicol or gentamicin (50 g/mL) but no cycloheximide [14]. Candida elective agar has, in addition to a nutritional foundation of yeast extract, glycine, and glucose, a "bismuth sulfite indicator" that inhibits the development of surrounding microbes. Candida and most other yeasts develop properly, reducing bismuth sulfite and turning brown to black in color [15]. The result of this

study was showed *C. albicans* one of the causative agents of candidiasis in human patients because of poor hygiene and smoking lead to impaired immune defense and destroy mucous membrane, so that become easy to penetrate from commensal *C. albicans* leads to candidiasis. *Candida albicans* is among the most commonly isolated species, and under certain environments, it may cause infections (candidiasis or thrush) in animals and humans [16]. *Candida albicans* is a polymorphic fungus that colonizes mucosal sites in many normal individuals, such as the stomach, vagina, and mouth and throat, among several other non-pathogenic fungi and bacteria [17,18].

Conclusion

The findings of this study concluded that human (males) have Candida spp. in their oral cavity and *Candida albicans* was cardinal causative agent to Thrush disease among the other *Candida spp.* This might explain why human with viral and bacterial infections have a high prevalence of candidiasis. The study emphasizes the significance of yeasts, particularly *Candida albicans*, finding different environmental roles.

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