

Incidence of *Candida glabrata* in Patient Specimens

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Abstract: Due to the rising concern of *Candida glabrata* as an important opportunistic pathogen, we have conducted a 5-year retrospective study to assess the prevalence of this yeast in various clinical specimens from patients with variable clinical diseases. We found the organism to be the second most prevalent yeast in clinical specimens with an isolation rate of 15.4% being anteceded only by *Candida albicans*. The specimens yielding highest number of isolates were high vaginal swab (60.8%) and urine (24.5%), indicating more involvement of *C. glabrata* in colonization or infection of the vagina and urinary tract.

Key Words: *Candida (Torulopsis) glabrata*, Patient (Clinical) specimens, Prevalence.

Introduction

Candida glabrata, (= *Torulopsis glabrata*), is an opportunistic yeast pathogen. It has been documented to cause serious and fatal infections in compromised patients [1-6]. The species has been associated with infections like endocarditis, cystitis, osteomyelitis, pyelonephritis, wound infection, vaginitis and fungemia. It has been reported to be a major pathogen in cancer

patients [1] and accounts for about 75% of cases of fungemia among bone marrow transplant patients receiving prophylactic fluconazole [6]. However, it would also be noted that the species may exist as a commensal in the gastrointestinal, urogenital and respiratory tracts [2,5]. Resistance of strains of *C. glabrata* to fluconazole and other azoles and to amphotericin B pose a major concern in the management of infections by this species [6,7].

Table 1. Number and percentage of *Candida glabrata* isolates among a total of 14189 isolates of yeasts grown in specimen cultures during a five-year period.

Isolates/Year	1991	1992	1993	1994	1995	Total
Total No. of yeast isolates	2265	3194	3320	2741	2669	14189
No. and % of <i>C. glabrata</i> isolates	334 (14.7%)	425 (13.3%)	497 (14.9%)	466 (17.0%)	473 (17.7%)	2195 (15.4%)

In view of the above, we have carried out a 5-year retrospective study to assess the occurrence of *C. glabrata* in various clinical specimens from different groups of patients admitted to an attending King Khaled University Hospital in Riyadh, which provides primary and tertiary medical care with about 650 bed occupancy.

Materials and Methods

Our records of 14189 yeast isolates from 14127 various clinical specimens processed in the Microbiology Laboratories during the period of 1 January 1991 to 31 December 1995 were analysed for frequency of *C. glabrata* isolations. The specimens were from 10172 patients with different clinical conditions, like gynaecological disorders, pregnancy, respiratory disorders, cancer, endocrine abnormalities, surgery, infections and other miscellaneous syndromes.

All yeasts isolated were tested for germ tube production in human serum and subcultured onto cornmeal agar (CMA) and Sabouraud's dextrose agar (SDA) containing 500 µg/ml. Cycloheximide and

50 µg/ml chloramphenicol. Identification of *C. glabrata* was based on negative germ tube test, absence of chlamydo-spores and pseudohyphae on CMA and results of carbohydrate assimilation using API 20 C system (Analytab products, Plainview, New York, USA). Relevant literature was also consulted during the identification process [8].

Results

During the five year period a total of 14189 yeast isolates were recovered, of which 2195 (15.4%) were identified as *C. glabrata*. The prevalence rate of *C. glabrata* appeared to increase over the 5-year period (Table 1).

C. glabrata was isolated from almost all types of specimens but was predominant among high vaginal swab (HVS, 60.8%) and urine (24.5%) specimens (Table 2). Thus 85% of the total *C. glabrata* isolates were recovered from these two specimens. HVS specimens always yielded the highest number of isolates compared to other clinical specimens. *C. glabrata* was recovered in low numbers from other

Table 2. Number and percentage of *Candida glabrata* isolates obtained from various clinical specimens during a 5-year period.

Year	Specimens								TOTAL
	HVS	URN	CATH	RES	SWAB	BLD	SKIN	OTHER	
1991	220 (65.9)	64 (19.1)	19 (5.7)	03 (0.9)	09 (2.7)	07 (2.1)	02 (0.6)	10 (3.0)	334 (100%)
1992	296 (69.7)	75 (17.6)	27 (6.4)	13 (3.1)	06 (1.4)	01 (0.2)	01 (0.2)	06 (1.4)	425 (100%)
1993	321 (64.6)	108 (21.7)	31 (6.3)	12 (2.4)	08 (1.6)	05 (1.0)	04 (0.8)	08 (1.6)	497 (100%)
1994	277 (59.4)	130 (27.9)	26 (5.6)	12 (2.6)	04 (0.9)	04 (0.9)	02 (0.4)	11 (2.3)	466 (100%)
1995	221 (46.7)	160 (33.8)	37 (7.8)	24 (5.1)	03 (0.7)	06 (1.3)	02 (0.4)	20 (4.2)	473 (100%)
Total	1335 (60.8)	537 (24.5)	140 (6.4)	64 (2.9)	30 (1.4)	23 (1.0)	11 (0.5)	55 (2.5)	2195 (100%)

HVS=High vaginal swab; URN=Urine; CATH=Catheters; RES=Respiratory specimens (e.g. sputum, bronchial washings); SWAB=Swabs from sites other than vagina; BLD=Blood; SKIN=Skin scrapings, nails; OTHER=Peritoneal dialysis fluid, pus, stool, exudate, vomitus, gastric aspirate, biopsy tissue, body fluid.

specimens namely catheter (6.45), respiratory (2.9%), blood (1%), and other miscellaneous specimens (Table 2).

Discussion

This investigation revealed that *C. glabrata* ranks second only to *Candida albicans* in frequency of isolation from various clinical specimens, which is in agreement with our previous report from King Khaled University Hospital [9]. The isolation rate of *C. glabrata* was found to be 15.4% among all yeasts which is higher than the 10% and 10.5% reported by others [9,10]. This is perhaps due to the larger data base of the current study or may be due to an increase in number of patients being

colonized or infected by this yeast.

Our study did not distinguish between colonization and infection, however, the higher rate of isolation should raise the suspicion of infection. *C. glabrata* has been associated with high mortality in compromised patients [5]. The frequent use of fluconazole in prophylactic regimens has led to development of resistance and subsequent rise in colonization and infection by this organism [6].

The high isolation rate of *C. glabrata* from HVS specimens (60.8%) supports the previous findings by others of the organism being the commonest etiology in female genital infections followed by *C. albicans* [11,12]. This high rate of isolation was also

observed in our previous study [9].

The prevalence of *C. glabrata* in urine specimens was 24.5% which is in accordance with a study by Kiehn *et al.*, [10] who reported a value of 23.7% isolations, whereas the previous study from this hospital [9] reported lower value (14%). During the study period an increase in the isolation rate of *C. glabrata* from urine was observed being 19.1% in 1991 to 33.8% in 1995. These results reflect an increase in colonization or infection of the urinary sites by the organism. *C. glabrata* has been reported to be the second most common yeast pathogen involving the urinary tract [13] and the treatment of this yeast is not efficient enough to eliminate the organism from this site [14], thus accounting for the high recovery of the organism from urine. *C. glabrata* fungemia has been observed in this study with the number of isolates recovered from blood amounting to about 1%. This has also been reported by others [1,5].

It is concluded that *Candida glabrata* is highly prevalent in clinical specimens being second only to *Candida albicans*. The highest number of isolates of the organism were from high vaginal swab and urine specimens supporting the existing knowledge on *C. glabrata* being a major yeast pathogen or colonizer in urogenital sites.

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مدى تفشى الخميرة المرضية كانديدا جلابراتا
في عينات المرضى (*Candida glabrata*)

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الملخص : نظرا لزيادة التركيز على الخميرة كانديدا جلابراتا من منطلق كونها فطر ممرض انتهازي هام فقد قمنا بدراسة لتحديد مدى تواجد هذه الخميرة في عينات إكلينيكية مختلفة من مرضى مصابون بأمراض مختلفة خلال خمسة أعوام .
ووجدنا أن هذه الخميرة المرضية ترتفع إلى الدرجة الثانية من بين كل الخمائر في العينات الاكلينيكية من المرضى (بنسبه ١٥,٤%) حيث تسبق فقط بواسطة الخميرة المرضية الرئيسية كانديدا البيكانز (*Candida albicans*). ووجدنا أن أعلى لا العزلات من هذه الخميرة كانت من عينات مسحات المهبل (٦٠,٨%) والبول (٢٤,٥%) داله على كثر تواجد أو التهابات المهبل والمسالك البولية بواسطة هذه الخميرة .