

Isolation and Detection of *Candida tropicalis* from Aborted Placenta in Al-Najaf city/Iraq

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ABSTRACT

Background: *Candida tropicalis* is one of the most causes of vulvovaginal candidiasis (VVC) in women. Systemic candidiasis and candidemia may also occur in pregnancies. Objective: This study was carried out to detect and isolate of this yeast from aborted placenta, which may cause severe complications such as spontaneous abortion. Materials and methods: Fresh aborted placenta were collected and washed by normal saline to remove the blood. Then, cut it into portions and place it in test tube containing 5 ml of normal saline. Finally, shake for 10 minutes, after that, cultured for microbial isolation. Isolation and detection were done by some conventional methods with Api candida and CHROMagar. Results: The results showed that four isolates of *C. tropicalis* (2%) were isolated from two hundreds samples from placenta of aborted women. Conclusions: Even with its rare occurrence, *C. tropicalis* has the ability to initiate intrauterine infection.

Keywords: *Candida tropicalis*; opportunistic fungi; spontaneous abortion; VVC; candidemia.

INTRODUCTION

Abortion is the elimination of gestation through eradicating a fetus or embryo from the uterus prior to become able to stay alive. Abortion considered as a member of the main medical problems in society¹. An abortion that occurs spontaneously is known a miscarriage². Various effectors associated with abortion such as Genetic and uterine anomalies, Endocrinopathy, immunological dysfunctions, infectious agents, environmental contaminants, psychogenetic elements and endometriosis³. Fungi are widespread in the environment. Some are associated with animals and humans as commensals but turn pathogenic or opportunistic after alteration of the host immune system. Progress of immunogenic syndromes, the unbalanced usage of immunosuppressive drugs, broad-spectrum antibiotics, malnutrition, endocrine disorders, aging and an increase in patient's population made the candidal infections increased in occurrence with treatment difficulties at last two decades⁴. *Candida tropicalis* is yeast belong the genus *Candida*. It considered the prevalent pathogenic reason in persons suffered from neutropenia. This yeast able to initiate candidemia then spread to vital body organs⁵. It present normally as normal flora on skin, gastrointestinal and female genitourinary tract⁶. *Candida tropicalis* is the next dangerous member of *Candida* species after *C. albicans* and similar to it in various virulence features⁷. *Candida tropicalis* is responsible for half of systemic candidal infections that caused by *Candida* species, especially in immunocompromised people⁸. The incidence of *C. tropicalis* infection raised globally as a result of its virulent arsenal such as biofilm

formation, bud to hyphal transformation, lytic enzymes creation and binding to various host's cell types⁹. Depending on the colonial site of *C. tropicalis*, several diseases produced via this yeast such as oral thrush, oropharyngeal candidiasis, angular cheilitis, balanoposthitis, and vulvovaginal candidiasis (VVC)¹⁰.

MATERIAL AND METHODS

Fresh segments from upper parts of placenta were collected and washed by normal saline to remove the blood. Then, place it in test tube involving 5 ml of Brain Heart Infusion (BHI) broth as transport media. These were shaking for 10 minutes, after that, cultured for microbial isolation¹¹. Cultural features, microscopic examination, germ tube formation test, growth on CHROMagar and API *Candida* commercial sugar assimilation test are the main criteria for identification of *C. tropicalis*¹².

Statistical Analysis

The Statistical analysis of the presented study was performed by Statistical Package for the Social Sciences (SPSS) version 20. The data were indicated by mean and \pm SD statistic test. Among the tested groups, comparison of the data had been done by independent t-test. Variation of age was detected by ANOVA test.

RESULTS

The distribution of the tested groups according to the age in the presented study was as the following: aborted women were <20 years 21 (10.5%), 20-29 years 98 (49%), 30-39 years 73 (36.5%) and \geq 40 years 8 (4%)

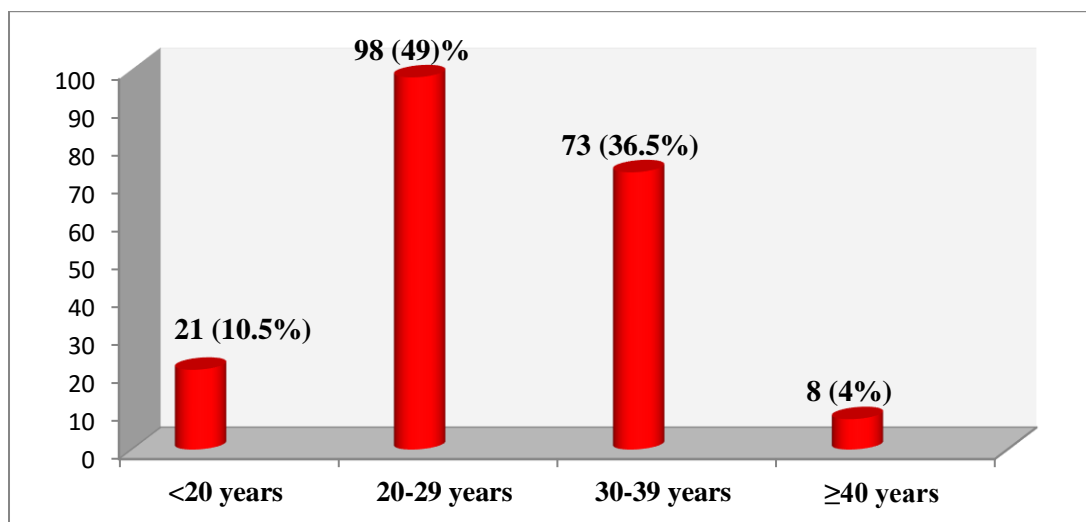


Figure 1: Distribution of aborted women according to age groups.

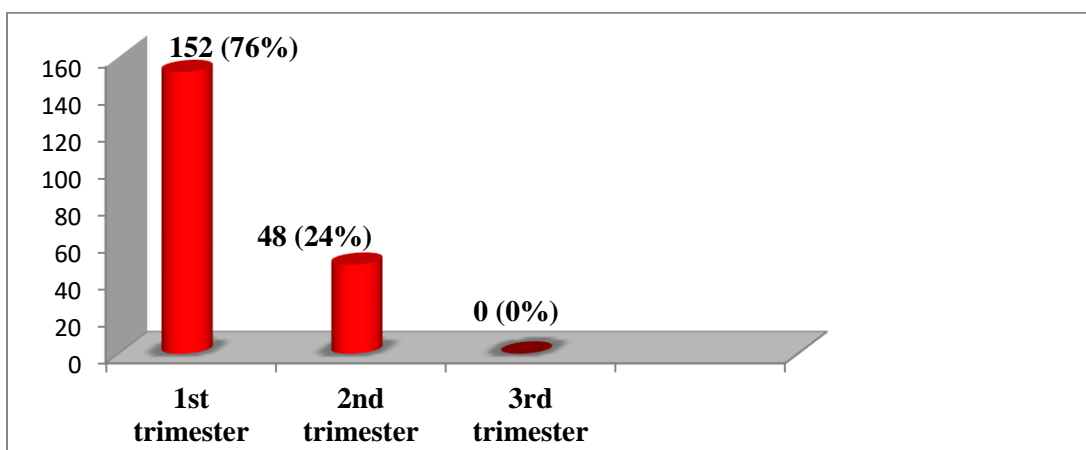


Figure 2: Distribution of aborted women according to the stages of pregnancy trimesters.



A



B

Figure 3: (A) Growth of *C. tropicalis* on Sabouraud dextrose agar. (B) Colonial growth of *C. tropicalis* on CHROMagar.

(Figure 1). The distribution of aborted women according to the stages of pregnancy trimesters were as in Figure 2. Four isolates of *C. tropicalis* (2%) were isolated from two hundreds samples from placenta of aborted women. The colonies of isolated *C. tropicalis* on SDA appeared white to creamy in color with round edges after 36-48 hrs at 37°C. The consistency was, soft and smooth (Figure 3A) and developed to wrinkle whitish creamy colonies after

further incubation for 7 days and odor of yeast like. The isolates of *C. tropicalis* lacked the ability to form germ tube after incubation in serum at 37°C for 90-120 minutes. Isolates of *C. tropicalis* showed bright-blue color colonies on CHROMagar after incubation for 48-72 hrs at 37°C (Figure 3B). To affirm the identification, candidal isolates were tested with API *Candida* system. The results were had the ability to utilize D-glucose, D-

Table 1: Results of *C. tropicalis* utilization of carbohydrates.

<i>C. albicans</i> isolates	substance												
	GLU	GAL	SAC	TRE	RAF	β MAL	α AMY	β XYL	β NA	β GU	β G	URA	
						L	L	L	G	R	AL		
Isolate 1	+	+	+	+	-	-	+	-	-	-	-	-	
Isolate 2	+	+	+	+	-	-	+	-	-	-	-	-	
Isolate 3	+	+	+	+	-	-	+	-	-	-	-	-	
Isolate 4	+	+	+	+	-	-	+	-	-	-	-	-	

Figure 4: *C. tropicalis* activity in API Candida System.

galactose, D-saccharose and D-trehalos in opposite condition, the yeast was unable to consume D-raffinose, β Xylose, β Galactose and urea (Figure 4).

DISCUSSION

Beside its existence as a normal flora, *Candida tropicalis* can initiate systemic infections in immunocompromised persons either endogenously candidaemia¹³ or exogenously¹⁴.

Candida tropicalis has the ability of biofilm creation¹⁵, which aids the yeast present on contaminated medical devices such as intrauterine devices made it capable to present at contaminated devices such as IUD and catheters. In many cases, the pregnancy occurs even with the presence of IUD and that may lead to candidal abortion¹⁶. In persons with immunological disturbances such as pregnancy, uses of broad spectrum antibiotics and organs transplantations, *C. tropicalis* found on the mucosa of the gastrointestinal tract as well as the mouth, oesophagus and vagina¹⁷.

The results of *C. tropicalis* on SDA were agreed with those of Baveja,¹⁸. This yeast also lack the ability to form germ tube and this results similar to that of Pincus *et al.*¹⁹. Appearance of *C. tropicalis* colony on chromagar with blue colour were similar to result fixed by Ghelardi *et al.*²⁰.

Results of API Candida System were agreed with those of Al-Oebady,²¹. *C. tropicalis* has the ability to utilize D-glucose (GLU), D-galactose (GAL), D-saccharose (SAC) and D-trehalose (TRE) (acidification) as sources of energy. In addition, this yeast can produce α -AMYlase enzyme that breaks 2-chloro-4-nitrophenyl-

α Dmaltotrioxide (α -AMY). Therefore, it gave positive results in these tests.

On other hand, this yeast lack the ability to consume 4-nitrophenyl- β Dmaltopyranoside (β MAL), 4-nitrophenyl- β Dxylopyranoside (β XYL), 4-nitrophenyl- β D-glucuronide (β GUR) and 5-bromo-4-chloro-3-indolyl- β D-galactopyranoside (β GAL) as a result of absence production of β -MALtoidase, β -XYLoidase, β -GLUCuRonidase and β -GALactosidase that break these compounds respectively. So, *C. albicans* showed negative results of these tests.

CONCLUSION

The data from the presented study explained presence of the *C. tropica* ilis n aborted placenta even with its few isolates. With this rare occurrence, it may considered as one of factors that lead to intrauterine inflammation followed by several complications.

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