

Prevalence of Vaginal Candidiasis among Diabetic and Non-Diabetic Pregnant Women in Three Hospitals in Tripoli -Libya

Taher Y. Abourghiba¹ and Zynab A. Alghadem²

Department of Botany, Faculty of Science, University of Tripoli, Libya.

¹abourghiba@ hotmail.com; ²zynab.alghadem75@gmail.com.

Abstract

The current study was conducted to detect vaginal infections of *Candida* among diabetic and non-diabetic pregnant women. It was performed on 140 pregnant women who were admitted to three hospitals in Tripoli, Libya from July 2017 to July 2018. Specimens were collected with sterile cotton swabs. Samples were cultured on Sabouraud dextrose agar(SAB). Specimens of fungal growth were examined microscopically for identification of *Candida* species. The results of investigations showed that pregnant women in the age range of 18-29 had higher percentage of *Candida* infections in comparison with other age groups. Three species of *Candida* were isolated and identified as *Candida albicans*, *Candida glabrata* and *Candida tropicalis*. There were no significant differences of vaginal infections among pregnant women who have different educational levels.

Keywords: Diabetic, Candidiasis; vaginal infection; Pregnancy; *Candida*.

المستخلص

تضمنت هذه الدراسة كشف الاصابات المهبيلية التي يسببها فطر المبيضات للنساء الحوامل المصابات بالسكري وغير المصابات ل 140 عينة مسحات مهبلية جمعت من نساء حوامل يترددن علي ثلاث مستشفيات بطرابلس، ليبيا . جمعت العينات بواسطة ماسحات قطنية معقمة ومسحت علي اوساط مغذية في حجرة العزل المعقمة. فحصت عينات من النمو الفطري مجهريا لتعريف انواع المبيضات . اوضحت نتائج هذه التحقيقات ان النساء الحوامل اللاتي يتراوح اعمارهن ما بين 18 - 29 لديهن اعلي نسبة من الاصابة بالمبايض بالمقارنة مع المجموعات العمرية الأخرى، تم عزل ثلاثة انواع من المبيضات في هذه الدراسة وهي: *Candida glabrata* , *Candida albicans* *Candida tropical*. بين التحليل الإحصائي لنتائج الالتهابات المهبيلية للنساء الحوامل انه لا توجد فروق معنوية من ناحية الاصابة بين النساء الحوامل باختلاف مستوياتهم التعليمية.

Introduction

Vaginal candidiasis is a female genital tract infection caused by *Candida* species in about 20-50 % of healthy women (Akah et al., 2010; Sobel, 2007). There are many species of *Candida*

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that cause candidiasis including *C. albicans*, *C. glabrata* and *C. tropicalis* (Cronje et al., 1994). *Candida* infections are very common in pregnant women as a result of the increased levels of estrogens and corticoids reducing vaginal defense mechanisms (Sobel, 1997). An estimated 75% of women experience at least one episode of candidiasis during their lifetime. Colonization by *candida* have been attributed to a number of factors, including pregnancy, prolonged use of antibiotics and poor personal hygiene (Akah et al., 2010; Alli et al., 2011).

Vaginal Infection shows symptoms such as vaginal itching, thick discharge resembling cottage cheese, irritation, burning with urination, swelling of the vulva, and vaginal tenderness and pain. Diabetes and yeast infection can often occur during pregnancy. Pregnant women with diabetes have a high risk of *Candida* infection because of the elevated sugar level in the blood which provides nutrients for yeast and encourages *Candida* overgrowth.

The aim of the study is to determine the prevalence of *Candida* infection in diabetic and non-diabetic pregnant women.

Materials and Methods

140 samples of vaginal swabs were collected from both diabetic and non-diabetic pregnant women who attended three hospitals in Tripoli, Libya. The range of ages was between 18- 49 years. Swabs were transported to Mycology lab, Department of Botany, Faculty of Science, University of Tripoli. Collection of samples took place during the period of 2017 to 2018.

In the laboratory, swabs were inoculated under aseptic conditions on Sabouraud dextrose agar (SAB), and plates were incubated at 25°C and 37 °C for 48 hours. Specimens of fungal colonies were stained by lactophenol and then mounted on microscope slides, morphological features of the isolates were examined under light microscope.

Species of *Candida* were identified using differential agar technique; and media were prepared according to manufacturer's instructions. HiCrome agar allowed differentiation of *Candida* species namely, *C. albicans*, *C. tropicalis* and *C. glabrata*.

Data were subjected to statistical analysis using Statistical Package for Social Science (SPSS).

Results

We investigated 140 diabetic and non-diabetic pregnant women. The results were analysed according to their age, educational level and presence or absence of diabetes. Their ages, ranged from 18-49 years. Of 140 (72%) of all samples had candidiasis.

The study showed prevalence (48.68%) of vaginal candidiasis among diabetic pregnant women and (51.68%) among non-diabetic pregnant women (Fig. 1).

The highest infection rate was reported among pregnant women aged 18 to 29 years followed by ages 30-40 years and 41- 49. Rate of infection was significantly higher among pregnant women aged between 18 to 29 years compared to other groups (Fig. 1).

The results of this study showed that prevalence of candidiasis among pregnant women with high level of education was less than who had lower level of education. However, there was

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no significant relationship between different education levels and prevalence of Candidiasis (Fig. 2).

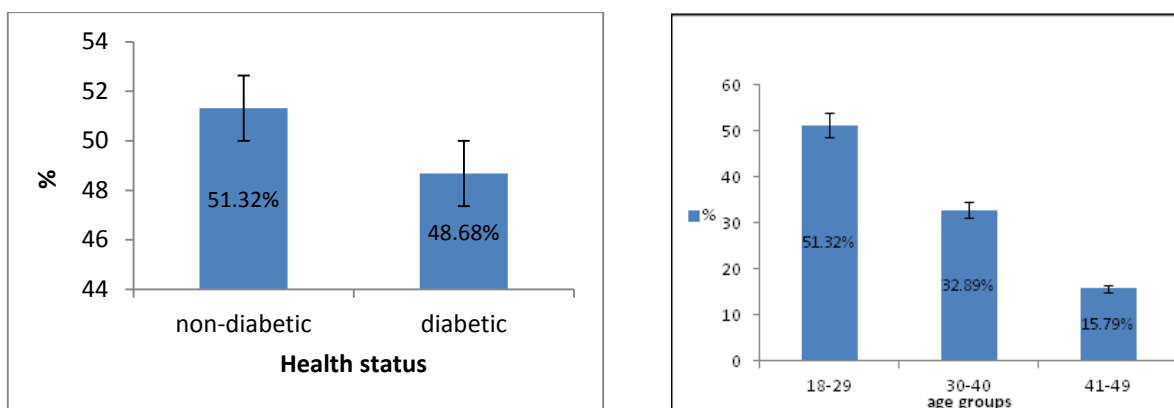


Fig. 1. Percentage of prevalence of Candidiasis, left, among diabetic and non-diabetic pregnant women and Right, among pregnant women with different ages.

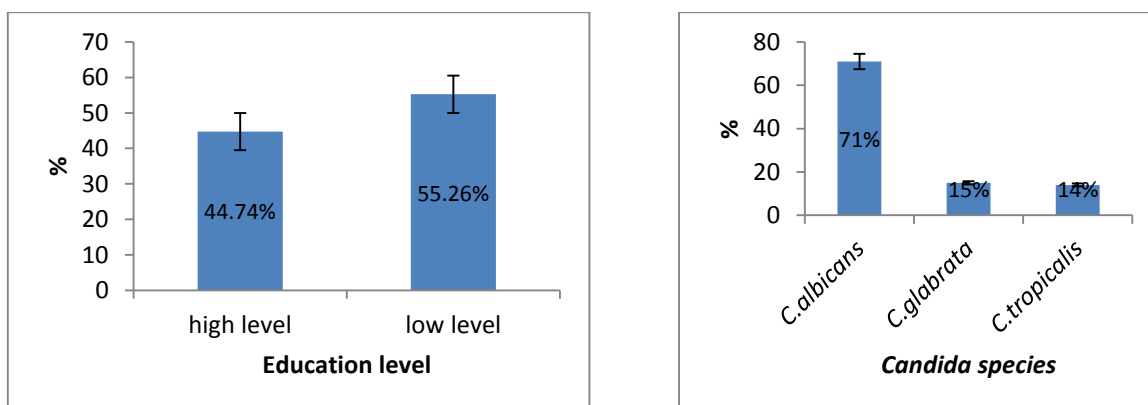


Fig. 2. Left, prevalence of candidiasis among pregnant women with different levels of education. Right, prevalence of Candida species.

The study revealed that *C. albicans* was present in highest number (71 %) followed by *C. glabrata* (15%) and *C. tropicalis* (14%) in all aged groups. The number of *C. albicans* was significantly higher than other species (Fig. 2).

The Identification of colonies of *Candida* species is based on color of colonies, light green colonies as *C. albicans*, blue as *C. tropicalis* and cream to white as *C. Glabrata* (Fig. 3).

Discussion

Candidiasis is the most common fungal infection and is responsible for 90% of the cases of infectious vaginitis (Hedayati and Shafiei, 2010). During pregnancy, the vagina is more

sensitive and often develops infections of candidiasis. In addition, the high incidence of candidiasis infection in pregnant women is linked to levels of estrogen, which is the main factor of infection. Also, increased glucose levels in genital tissues enhance *Candida* adhesion and growth, which is often in pregnant women. Many studies showed that *Candida* is more prevalent with women with diabetes than non-diabetic during pregnancy (Lawrence et al., 2008; Fidel et al., 2002). However, the results of this study showed that *Candida* infection was higher in healthy women (51.37 %) than those with diabetes (48.68%). This is due, in our interpretation, to constant medical observations that the diabetic pregnant undergo.

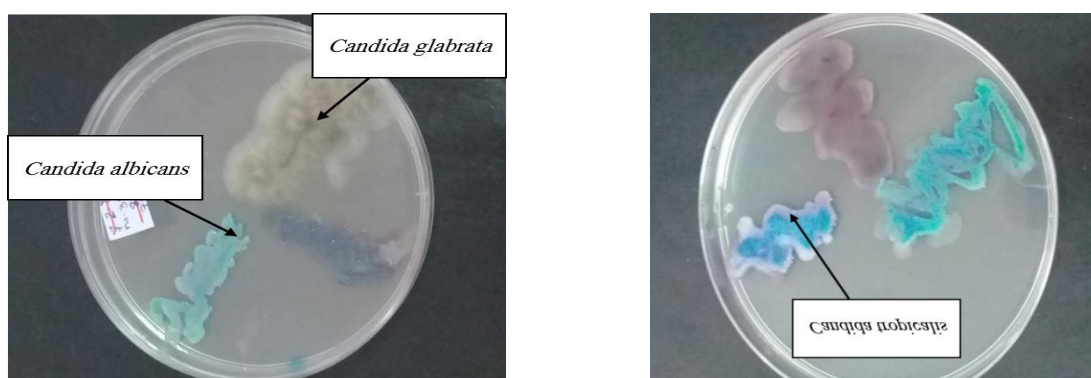


Fig. 3. *Candida* differential agar used to differentiate species.

This study also showed that the prevalence of *Candida* infection was higher in the age group 18-29 compared to the older age groups. Similar finding was observed in many studies (Sobel, 1995; Parveen et al., 2008; Marcano and Feo, 1983; Feyi-Waboso and Amadi, 2001).

The reported data in this study can be attributed to several reasons including use of contraceptive pills and higher sexual activities of younger age of women compared to other age groups who are becoming less sexually active and they rarely use contraceptives. Moreover, vaginal immunity may increase as the levels of estrogen and corticoids decrease (Nelson et al., 2013).

We have reported that the educational level had some effect on the prevalence of candidiasis, with 44.74% infections of pregnant women with University education level compared to 55.26% of women with lower educational level. This finding is similar to the results of the study conducted by Liyana et al. (2016).

The findings of the present study revealed that *C. albicans* was more prevalent (71%) followed by *C. glabrata* (15%) and *C. tropicalis* (14 %), Similar findings were observed in several studies (Muvunyi et al. 2009; Nelson et al., 2013; Faidh, 2013; Zisova et al., 2016).

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