

Prevalence of Vaginal Candidiasis infection in women referred to Kermanshah hygienic centers, Iran in 2010Reza Faraji ¹, Mehr Ali Rahimi ^{1,2*}, Mojdeh Assarehzadegan ³¹. Diabetes Research Center, Kermanshah University of Medical Sciences, Kermanshah, Iran.². Department of Endocrinology, Medical School, Kermanshah University of Medical Sciences, Kermanshah, Iran.³. MD, Mohamad Kermanshahi Hospital, Kermanshah, Iran.Corresponding email: mjavadra@yahoo.com

Abstract: Vulvovaginal Candidiasis is a female genital system infection that occurs due to *Candida* species. *Candida* infection in the vagina can cause a smelly, thick, white – yellow discharge that might be accompanied by itching, irritation and swelling. It can also make walking, urinating or sex very painful. The aim of this study is determining the prevalence rate of vaginal candidiasis infection in women referred to Kermanshah hygienic centers, Iran in 2010. This descriptive – analytic study was performed on 105 women referred to Kermanshah hygienic centers, Iran in 2010. All specimens were examined under direct microscopy and cultured on Sabouraud Dextrose Agar (SDA). Complimentary tests such as germ tube test and sugar assimilation test (API) were carried out to differentiate the *Candida* species. Statistical analysis was performed using the Chi-square test. Of 105 samples under examination, 10 cases (9%) in direct microscopy test and 30 cases (29%) by cultivation on Sabouraud Dextrose Agar were infected to vaginal candidiasis. The frequencies of the isolated *Candida* species include *C.albicans* with 28 cases (70%), *C.glabrata* with 5 cases (12.5%), *C.kruzi* with 3 case (7.5%), *C.tropicalis* with 2 cases (5%) and *C.parapsilosis* with 2 cases (5%). *C. albicans* was, by far, the most predominant yeast isolate. The culture of vaginal discharge should be warranted because the culture technique is more sensitive than direct smear.

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Introduction

Vaginitis is the most common gynecological problem in women. The three infections most commonly associated with vaginal discharge are bacterial vaginosis (BV), vulvovaginal candidiasis (VVC) and trichomoniasis (1,2). Vulvovaginal candidiasis is the second most frequent infection after Bacterial vaginosis. Up to 75% of all women will experience fungal vulvovaginitis at some point in the lives, and approximately 40-50% will experience a second episode of this disease (3-5). *Candida* infection in the vagina can cause a smelly, thick, white – yellow discharge that might be accompanied by itching, irritation and swelling. It can also make walking, urinating or sex very painful (6). Since the symptoms of vaginal candidosis are not specific to the infection, diagnosis cannot be made solely on the basis of history and physical examination. But the clinical diagnosis of vaginal candidiasis should always be confirmed by laboratory diagnosis. Unfortunately, up to 50% of patients with culture positive symptomatic vaginal candidosis will have negative microscopy. Thus, although routine cultures are not necessary if microscopy is positive, vaginal culture should be done in symptomatic women with negative microscopy (7). Common risk factors for vaginal candidiasis are recent antibiotic use, pregnancy, diabetes mellitus, oral-contraceptives

and inadequate therapy (8). Among women with acute vulvovaginal candidiasis, *Candida albicans* accounts for 80–90% of the isolated fungal species, whereas other species are less frequent. Nevertheless, in recent years a significant increase in infections caused by non-*albicans* species of *Candida* has been suggested (3,8-10). The aim of this study is determining the prevalence rate of vaginal candidiasis infection in women referred to Kermanshah hygienic centers, Iran in 2010.

Materials and Methods

This descriptive – analytic study was performed on 105 women referred to Kermanshah hygienic centers, Iran in 2010. We administered a questionnaire to obtain information about: age, occupation, education, symptoms, contraception, marital status and diabetes mellitus. Two sterile cotton-tipped swabs were used to collect discharge from high vagina and sent to the laboratory without delay. One of the two swabs was used to determine the presence of yeast by methyleneblue staining in direct microscopy, while the other was used for fungal culture (culture on sabouraud's dextrose agar supplemented with 50 mg chloramphenicol). The diagnosis of VVC were based pseudohyphae identified by microscopic examination and whom *candida* grew on high vaginal swab culture. Isolated

strains were identified using the germ tube test and API system 20C AUX (Biomérieux, France) (11,12). Statistical analysis was performed using the Chi-square test and a p-value <0/05 was considered as significant.

Results

105 women referred to Kermanshah hygienic centers, Iran in 2010 were eligible for this study.

All women age was 18-55 years (9 ± 36). 81% of the women had irritation, 74% had itching and 87% had discharge were in relation with VVC. The above symptoms were seen in the most of the women and the symptoms of other cases were not relevant to VVC. Regarding the educational level 86% of women were illiterate and high school, and 14% were college educated. 81% of women were housewives, and the rest were working women. 50% of women have used of contraception devices such as: Intrauterine device (IUD), Hormonal and condom. 80% of women were married and 20% were single. 70% of women had diabetes mellitus. The prevalence rate of vaginal candidiasis infection according direct test and Mixture Culture reported sequently 9% and 29% (Figure 1,2,3). Species of *candida* isolated in this patients consist of: *C. albicans* with 28 cases (70%), *C. glabrata* with 5 cases (12.5%), *C. Kruzi* with 3 case (7.5%), *C. tropicalis* with 2 cases (5%), and *C. parapsilosis* with 2 cases (5%) that *C. albicans* was, by far, the predominant yeast isolate (Table1). In the present study we found a significant statistical difference between vulvovaginal candidiasis and age, education, symptoms, contraception, marital status, and diabetes mellitus, But we did not find a significant statistical difference between vulvovaginal candidiasis and occupation (Table 2).

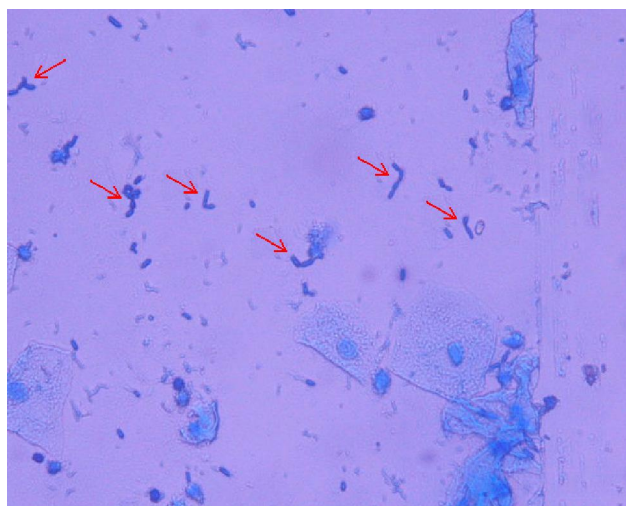


Figure 1. Pseudohyphae identified on microscopic test



Figure 2. The growth of cells *candida* on Sabouroud Dextrose Agar

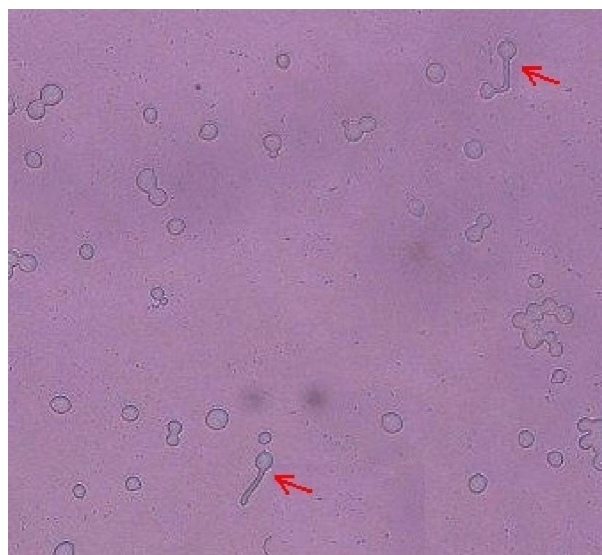


Figure 3. Germ tube identified on microscopic test

Discussions

Vaginitis is one of the most common conditions for which women seek medical care in many parts of the world. It is usually characterized by a vaginal discharge or vulvar itching and irritation. It is usually characterized by a vaginal discharge or vulvar itching and irritation (2,13). Nowadays vaginal yeast infection is usually diagnosed on the basis of clinical symptoms, direct microscopic examination and vaginal culture. The microscopic examination of the clinical material is rapidly performed and may identify the presumptive etiologic agent, but vaginal culture is indispensable to confirm the diagnosis (8,14).

Table 1. Frequency of different *Candida* species isolated from women referred to Kermanshah hygienic centers, Iran in 2010.

<i>Candida</i> species	Positive cases	Percentage (%)
<i>C. albicans</i>	28	70
<i>C. glabrata</i>	5	12.5
<i>C. krusei</i>	3	7.5
<i>C. tropicalis</i>	2	5
<i>C. parapsilosis</i>	2	5
Total	40	100

Table 2. Predisposing factors for infection in women referred to Kermanshah hygienic centers, Iran in 2010.

Predisposing factors	positive cases (n)	Percentage (%)	Pvalue
Age			
≤ 40 years	22	73	0.041
> 40 years	8	27	
Occupation			0.313
Working	14	47	
Housewife	16	53	
Education			0.0005
College	11	37	
illiterate, high school	19	63	
Symptoms			0.001
irritation	85	81	
itching	78	74	
discharge	91	78	
Contraception			0.033
Yes	18	60	
No	12	40	
Marital status			0.032
Married	24	80	
Single	6	20	
Diabetes mellitus			0.005
Yes	20	67	
No	10	33	

Qinghai, et al. found only 1 cases (0.3%) pseudohypha by microscopic examination. Grigoriou, et al. strongly believed that diagnosis must be made thorough vaginal cultures. In our study, on the basis of microscopic examination and the vaginal discharge culture we had 9% and 29% prevalence rate, respectively. Based on this study and also similar studies, it could be said the discharge culture is more sensitive than the direct microscopy test. In this study as the other studies (8,15-18) the most separated species from the patients was *C. albicans*. The first step in establishing a yeast infection is bonding to the vaginal mucosa. It seems that *C.*

albicans is more adhesive than other non-*C. albicans* species. This could be considered as one of the likely reasons that this species are predominant rather than non-*C. albicans* species (8,17). But unlike other studies on the prevalence of non-*C. albicans* species as increasing species (12,19-21) a high rate of prevalence of non-*C. albicans* species was not achieved in our study. In this study most of the women with vaginal candidiasis infection were mainly categorized into an age ≤ 40 years. That maybe the reason is the activeness of the age of this group from the women of view of sexual, vaginal increase secretions, and the high amount of signed infection at the reproductive ages. We found a significant statistical difference between positive vaginal *Candida* culture and Marital status. That factors such as genital hygiene, menstrual cycle, and contraception are substantial. Also we found a significant statistical difference between vaginal candidiasis and contraception method, so that women who had used of hormonal contraception, IUD, and Condom were 60%, that can be related to low doses of hormones, vaginal increase secretions and the acidity of the PH of vaginal by IUD, and the sensitivity of vaginal epithelial cells to Condom. A significant statistical difference between vaginal candidiasis infection and education was found in this study, which could be attributed to the observance of genital hygiene and recognize the risk factors of cause diseases. The symptoms often include burning, itching and discharge which have been proved by many relevant studies.18 In the present study, also we found a significant statistical difference between positive vaginal *Candida* culture and symptoms. In addition Peer, et al. showed that 25.4% of infected women with vaginal candidiasis infection did not present any clinical symptom. It can be concluded from the above points that vaginal candidiasis infection is not always accompanied by sever detectable symptoms and sometimes it does not demonstrate any symptom and sometimes it shows very mild symptoms. Different studies indicated that vulvovaginal candidiasis infection is more common in women with diabetes than in the normal population. The prevalence rate ranged from around 7% to more than 50% (6,22,23) Similar to the study by Malazy, et al. we found a significant statistical difference between positive vaginal *Candida* culture and diabetes mellitus. Bohanon, stated that the main causes of this state of affairs is hyperglycemia. Increased glucose levels in genital tissues enhance yeast adhesion and growth. Vaginal epithelial cells bind to *Candida* with greater propensity in diabetic women than in non-diabetic women. Furthermore diabetes mellitus plays an important role in prevalence vaginal *Candida* infection.

Conclusion

The present study involved only 105 women. There is need to perform similar study in large number and for a longer duration. But according to the results in this study *C. albicans* was, by far, the most predominant yeast isolate. Also The culture of vaginal discharge should be warranted because culture technique is more sensitive than direct smear.

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