

A THREE-YEAR RETROSPECTIVE ANALYSIS OF VAGINITIS AGENTS IN PATIENTS ADMITTED TO A PRIVATE HOSPITAL

Özel Hastaneye Başvuran Hastalarda Vajinit Etkenlerinin Üç Yıllık Retrospektif Analizi

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ABSTRACT

ÖZ

Objective: In this study, we aimed to present the pathogens detected as vaginal infection agents isolated from vaginal swab samples in adult patients admitted to the Department of Gynecology and Obstetrics of a private hospital in Istanbul for three years retrospectively.

Material and Methods: Vaginal swabs of adult non-pregnant patients admitted to Gynecology and Obstetrics outpatient clinics of a private hospital in Istanbul between 2016-2018 were included in this study. The samples were transferred quickly to the laboratory after sampling, and the infectious agents were identified with conventional bacterial culture methods.

Results: Identification results of 314 vaginal swab samples revealed that 28 (8.92%) had *C. albicans*, 13 (5.73%) had pathogens that cause aerobic vaginitis, and five (1.59%) had bacterial vaginosis agents. *C. albicans* was the highest among agents with a frequency of 8.92%, followed by *E. coli* (2.23%).

Conclusion: Our retrospective analysis revealed that *C. albicans* is the most frequent pathogen causing vaginitis in our hospital. As the pathogens causing vaginitis vary from region to region, we believe that monitorization of the epidemiological data is important.

Keywords: Vaginitis; *Candida albicans*; retrospective analysis

Amaç: Vajinitler, kadınlarda yaygın olarak görülen ve hastaneye gitme sıklığını artıran önemli bir halk sağlığı sorunudur. Biz de bu çalışmada, 3 yıllık periyotta, İstanbul'da bir özel hastanenin kadın doğum bölümüne başvuran erişkin hastalarda vajinal sürüntü örneklerinden vajinal enfeksiyon etkeni olarak saptanan patojenleri retrospektif olarak ortaya koymayı amaçladık.

Gereç ve Yöntemler: 2016-2018 yılları arasında İstanbul'da bir özel hastanenin kadın hastalıkları ve doğum polikliniklerine başvuran, vajinit şüphesi olan, erişkin, hamile olmayan hastalardan vajinal sürüntü örnekleri alındı. Numuneler hızlıca laboratuvara ulaştırıldı ve klasik kültür yöntemleri kullanılarak tespit edilen etkenler incelendi.

Bulgular: Üç yıllık süreçte hastaneye başvuran 314 hastada saptanan etkenler incelendiğinde, 28'inde (%8.92) *C. albicans*, 13'ünde (%5.73) aerobik vajinit etkenleri ve beşinde (%1.59) bakteriyel vajinoz etkenleri saptandı. *C. albicans* %8.92 ile etkenler arasında en yüksek oranda saptanırken, bunu *E. coli*'nin (%2.23) takip ettiği görüldü.

Sonuç: Çalışmamızda gerçekleştirdiğimiz retrospektif analizle, hastanemizde *C. albicans*'a bağlı vajinitlerle daha sık karşılaştığımız saptanmıştır. Vajinitlere neden olan etkenlerin bölgeden bölgeye farklılaşabilmesi ve hangi etkenlerle karşılaşılabilmesine dair bir perspektif sunması açısından epidemiyolojik verilerin takip edilmesi gerektiği kanaatindeyiz.

Anahtar Kelimeler: Vajinit, *Candida albicans*, retrospektif analiz



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INTRODUCTION

Vaginitis or vaginal infections are common clinical syndromes encountered in obstetrics and gynecology practice. The incidence of vaginal infections worldwide is increasing day by day, and they can occur at any age (1). The most common form of vaginitis, bacterial vaginosis, is a picture with the decrease of aerobic lactobacilli in the vaginal flora and the increase of anaerobe *Bacteroides*, *Peptostreptococcus*, *Gardnerella*, and *Mycoplasma* species (2). Aerobic vaginitis, which is often confused with bacterial vaginosis due to reasons such as malodorous discharge and increased pH, is caused by aerobic pathogens or commensals, which often progress with rash, edema, and sometimes ulcerations in the inflamed vagina (3). *Candida* species, which may also be a member of normal vaginal flora, is an important infectious agent of vulvovaginitis. Although vulvovaginal candidiasis is a clinical case encountered by approximately 75% of adult women at least once in their lives, 45% of women have at least two episodes of infection each year (4). Vaginitis is a global health problem that can affect women, men, families, and communities. It can have serious consequences such as infertility, ectopic pregnancy, chronic pelvic pain, the risk of miscarriage, preterm birth, and the risk of delivery of a low birth weight baby. Therefore, proper prevention, treatment, and follow-up of these diseases are crucial (5,6). Thus, in our study, we aimed to reveal the pathogens detected as vaginal infection agents from vaginal swab samples in adult patients admitted to the gynecology and obstetrics department of a private hospital in Istanbul between 2016-2018 retrospectively.

MATERIALS AND METHODS

Ethical Considerations

This retrospective study was approved by the academic ethics committee of Medical Park Fatih Hospital, Istanbul, Turkey (Approval number: 2021-1-4) and

performed according to the Declaration of Helsinki. A waiver of consent was obtained, and patient confidentiality was maintained.

Study Design and Setting

Clinical examinations of adult non-pregnant patients admitted to the outpatient clinics of a private hospital between 2016 and 2018 were performed by clinicians, and their vaginal symptoms were recorded. During the examinations, vaginal swab samples were taken using sterile swabs. All samples were quickly transferred to the microbiology laboratory. Each vaginal swab sample was inoculated on 5% sheep blood agar (Oxoid, Basingstoke, Hampshire, UK), MacConkey agar (Oxoid, Basingstoke, Hampshire, UK), and Chocolate agar (Oxoid, Basingstoke, Hampshire, UK). All cultures were incubated for 48 hours at 37°C in an environment with 5% CO₂. Also, each swab samples were gram-stained (7). Gram staining, colony morphology, and hemolytic reactions the on-blood agar medium were checked for the pre-characterization of the pure strains after the incubations. The identifications of these strains were performed according to routine tests such as DNase and catalase production, optochin and bacitracin susceptibility, CAMP and bile esculin test for Gram-positives, and indole, H₂S or gas production, motility, urease production, citrate usage and fermentation of different carbohydrates for Gram-negatives (7). Identification of unidentified pathogens with conventional methods were performed with Vitek 2 Compact (Biomérieux, France). The diagnosis of bacterial vaginosis was evaluated according to the Nugent classification, and the diagnosis of aerobic vaginitis was evaluated according to the Donders criteria (8,9).

RESULTS

The number and mean age of the patients admitted to the gynecology and obstetrics outpatient clinic and included in this study are shown in Table 1.

According to our retrospective analysis, two (7.14%) of 28 patients admitted to the hospital in 2016 had *Candida albicans*-derived vulvovaginitis. Also, bacterial vaginosis was detected in five (17.8%) patients; two (7.14%) of them had *Gardnerella vaginalis*, while three (10.7%) of them were infected with *Mobilincus* spp. Moreover, in the patients admitted in 2017, *C. albicans* was isolated from 14 (35.9%) of 39 patients, while *Escherichia coli* was detected in 1 patient diagnosed

with aerobic vaginitis. Finally, in 2018, *C. albicans* was detected as the agent of vulvovaginitis in 12 (4.86%) of 247 patients admitted to the hospital. In addition, *E. coli* was detected in 6 (2.43%), *K. pneumoniae* detected in 5 (1.59%) patients, *Streptococcus agalactiae* in 3 (1.21%), and also *Staphylococcus epidermidis*, *S. lugdunensis*, and *Pseudomonas putida* were found as the causes of aerobic vaginitis in one (0.40%) patient for each (Table 1).

Table 1: Demographic data of the patients and distribution of agents of vaginitis by years. n (%)

	2016	2017	2018	Total
n:	28	39	247	314
Age (Mean±SD)	36.44±11.08	32.07±6.56	33.16±8.75	33.36±8.77
	n (%)	n (%)	n (%)	n (%)
Normal Flora	21 (75)	24 (61.54)	218 (88.26)	263 (83.76)
<i>Candida albicans</i>	2 (7.14)	14 (35.90)	12 (4.86)	28 (8.92)
<i>Gardnerella vaginalis</i>	2 (7.14)	0 (0)	0 (0)	2 (0.64)
<i>Mobilincus</i> spp.	3 (10.71)	0 (0)	0 (0)	3 (0.96)
<i>E. coli</i>	0 (0)	1 (2.56)	6 (2.43)	7 (2.23)
<i>Klebsiella</i> spp.	0 (0)	0 (0)	5 (2.02)	5 (1.59)
<i>P. putida</i>	0 (0)	0 (0)	1 (0.40)	1 (0.32)
<i>S. epidermidis</i>	0 (0)	0 (0)	1 (0.40)	1 (0.32)
<i>S. lugdunensis</i>	0 (0)	0 (0)	1 (0.40)	1 (0.32)
<i>S. agalactiae</i>	0 (0)	0 (0)	3 (1.21)	3 (0.96)

The frequency of vaginal infections due to *C. albicans* among all factors detected was statistically significant (p <0.05).

Within a total of three years period, *C. albicans* was isolated from 28 (8.92%) of 314 patients admitted to the hospital's gynecology and obstetrics outpatient clinic. In addition, the agents of aerobic vaginitis were found in 18 (5.73%), while the agents of bacterial vaginitis were found in five (1.59%) of the patients. Moreover, *C. albicans* was evaluated as the most frequent agent in vaginal infections with a rate of 8.92%, which was followed by *E. coli* (2.23%).

The frequency of vaginal infections due to *C. albicans* among all agents detected was statistically significant (p <0.05).

DISCUSSION

Vaginitis is an important health concern increasing morbidity (10,11). Most women experience vaginitis at some point in their lives (6). Neither its etiology nor the reasons for obtaining variable prevalence data in

different world regions are entirely clear, but it is important to know the epidemiology of vaginitis for preventing the transmission (12).

When the studies conducted in our country are considered, Kalkancı et al. reported *G. vaginalis*, *Candida* spp., and *E. coli* as the most frequent pathogens of vaginitis with the rates of 18.5%, 16.4%, and 10.9% respectively in their study conducted on 567 women in 2005 (13). Similar to our study, they noted that they also detected *Klebsiella* spp, coagulase-negative *Staphylococcus* spp, *Pseudomonas* spp, and *S. agalactiae* in some cases. Atmaca et al., in their study on samples obtained from prostitutes in 1998, observed that *Gardnerella vaginalis* (19.4%), *Candida* spp (13.9%), and group B *Streptococci* (13.9%) were the most common agents (14). In our study, differently from the data of Kalkancı et al., and Atmaca et al., *C. albicans* was found as the dominant agent of vaginitis. Polat et al., detected *C. albicans* in 10.14% of 207 patients with vaginitis in the study conducted in Istanbul in 2012, which is similar to the rate (8.92%) we detected in our study (15). Açıkgöz et al., analyzed 8050 samples in their study conducted in 2002 and detected *Candida* spp. and *G. vaginalis* as the most common pathogens with the rates of 26.8% and 13.8%, respectively (16). Similar to the study by Açıkgöz et al., *C. albicans* was the most common vaginitis agent in our study.

When the studies from different parts of the world are examined, aerobic vaginitis was detected in 300 (15.4%) of 1948 patients who applied with vaginitis complaints in a study conducted in China between July and December 2011 (17). Also, it was observed that *S. aureus*, *E. coli*, and *E. faecalis* species were detected at a very high rate (99.33%) compared to the rest of the flora. However, Group B streptococci (0.67%) were found to be less than these species. In addition, aerobic vaginitis was observed in 116 (38.67%) of these 300 patients, while aerobic vaginitis was found with bacterial vaginitis in 101 (54.89%) and with vulvovaginal candidiasis in 48 (26.09%) of the

remaining 184 patients (17). Moreover, in another study conducted in China between April 2008 and August 2009, aerobic vaginitis was detected in 156 (23.74%), and mixed infections were detected in 84 of 657 patients admitted to the hospital with vaginal symptoms (18). In 32 of these 84 patients, aerobic vaginitis co-existed with vulvovaginal candidiasis (38.10%); also, bacterial vaginosis was found in 31 (36.90%), and trichomonal vaginitis was found in 21 (25%) of the patients (18). However, in our study, vaginitis due to *C. albicans* was more frequent. Razzak Al-Charrakh and Al-Greitty, in their study investigating the opportunistic bacterial pathogens of vaginitis, reported *S. aureus* (18.9%) as the most frequent pathogen and followed by *E. coli* (16.2%) (10). In our study, *E. coli* was found as the most frequent bacterial agent of vaginitis. Razzak, Al-Charrakh, and Al-Greitty also detected *K. pneumoniae* in 2 and group B *streptococcus* in 5 cases, similar to our study. However, *Trichomonas vaginalis* is not detected in any of the patients in this study (10). When the data obtained from previous studies are evaluated, there are differences in the distribution and the frequency of the agents of vaginitis from country to country, even from region to region. Moreover, it can be seen that the rate of the agents we have detected is relatively low.

Since the patients included in our study were patients who were admitted to private hospitals, the limitation of our study is that the socioeconomic status of our patients were middle and upper class, and our epidemiological data reflect patients included in this socioeconomic class.

In conclusion, according to the retrospective analysis we performed in our study, it was determined that vaginitis due to *C. albicans* is more frequent in our hospital. In order to prevent sexually transmitted diseases, it is important to know the epidemiology of vaginitis and control the distribution of its agents. Knowing the incidences of the agents of vaginitis that can be found at different rates in different regions may be useful for

clinicians to provide a perspective in their approach to these cases.

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