



Evaluation of Clinical and Microbiological Features of Vulvovaginitis in Prepubertal Girls

Prepubertal Kız Çocuklarında Vulvovajinitin Klinik ve Mikrobiyolojik Açıdan Değerlendirilmesi

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ABSTRACT

The most common gynecological problem in prepubertal girls is vulvovaginal infections. In this retrospective study, the records of patients who were diagnosed with prepubertal vulvovaginitis between January 2014 and January 2019 in the pediatric outpatient clinic of our university hospital were retrieved. 46 patients were included in the study. The mean age of the children was 82±37.6 months. No growth in culture was observed in 9 patients (19.6%). Microorganisms that are members of the skin and vaginal flora were positive in 16 patients (34.8%). *Coagulase negative staphylococcus* was positive in 11 patients (23.9%), *diphtheroids* in 5 patients (10.9%), *E.coli* in 11 patients (23.9%), *Streptococcus pyogenes* in 4 patients (8.7%), *Gardnerella vaginalis* in 3 patients (6.5%), *Candida albicans* in 2 patients (4.3%), least frequently *Enterobacter* in 1 patient (2.2%). All of our patients were evaluated when their symptoms started and their treatments were given by the first application centers. *Candida* vulvovaginitis is very rare in prepubertal girls, but antifungal cream was prescribed to all our patients. In this age group, vaginal culture is mostly negative. Nonspecific vulvovaginitis, which is treated with hygiene measures in the prepubertal age group, should be kept in mind. The most frequently isolated pathogens are intestinal flora and respiratory pathogens.

Key words: Bacterial vaginitis, microbial agents, prepubertal, vulvovaginal candidiasis

ÖZET

Prepubertal kızlarda en sık görülen jinekolojik problem vulvovajinal enfeksiyonlardır. Bu retrospektif çalışmada üniversite hastanemizin çocuk polikliniğinde Ocak 2014-Ocak 2019 tarihleri arasında prepubertal vulvovajinit tanısı alan hastaların kayıtları incelendi. 46 hasta çalışmaya dahil edildi. Çocukların yaş ortalaması 82±37.6 ay idi. 9 hastada (%19.6) üreme gözlenmedi. Cilt ve vajinal flora üyesi olan mikroorganizmalar 6 hastada (34.8%) pozitif bulundu. Bunlar; 11 hastada (%23.9) *koagülaz negatif stafilokok*, 5 hastada (%10.9) *difteroidler* idi. *E.Coli* 11 hastada (%23.9), *Streptokokus pyogenes* 4 hastada (%8.7), *Gardnerella vajinalis* 3 hastada (%6.5), *Kandida aalbikans* 2 hastada (%4.3) ve en az sıklıkla *Enterobakter* 1 hastada (%2.2) saptandı. Tüm hastalarımız semptomları başladığında değerlendirilmiş, tedavileri ilk başvuru merkezleri tarafından verilmişti. Prepubertal kızlarda *kandida* vulvovajinit çok nadir görülmekle birlikte tüm hastalarımıza antifungal krem yazılmıştı. Bu yaş grubunda vajinal kültür çoğunlukla negatiftir. Prepubertal yaş grubunda hijyen önlemleriyle tedavi edilen spesifik olmayan vulvovajinitakıldatutulmalıdır. En sık izole edilen patojenler ise bağırsak florası üyeleri ve solunum patojenleridir.

Anahtar kelimeler: Bakteriye vajinit, mikrobiyal ajan, prepubertal, vulvovajinal kandidiyazis

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INTRODUCTION

Vulvovaginitis is an inflammation of the vulva and vaginal tissues. It is the commonest gynecological problem in prepubertal girls.¹ The most common cause of vulvovaginitis in the prepubertal pediatric age group is nonspecific vulvovaginitis.² Nonspecific vulvovaginitis is typically caused by irritation of the sensitive unestrogenized skin of the prepubertal child. The vaginal culture is typically negative for any pathogens. Nonspecific vulvovaginitis is responsible for 25 to 75 percent of vulvovaginitis in prepubertal girls.³ Nonspecific vulvovaginitis can be treated with simple hygiene measures. Clinicians sometimes attempt to diagnose and treat prepubertal children as they do for the pubertal adolescent females.² Despite vulvovaginitis being a common problem, the initial management is mostly empirical, and antibiotics are commonly prescribed.²

Vulvovaginal infections should be handled differently in prepubertal girls from pubertal girls and adult women in terms of both causative pathogens, clinical findings, and treatment. Ahead from nonspecific vulvovaginitis, knowing the pathogens causing specific vulvovaginitis is important in order to choose the right antibiotherapy. In the prepubertal period anaerobic vaginal flora caused by low estrogen levels in childhood prevents *candida* infections.⁴ Although *candida* vulvovaginitis is very rare in prepubertal girls, clinicians tend to prescribe an antifungal cream to children with symptoms of vulvovaginitis. The available evidence suggests that vaginal secretions should be obtained for microbiological investigations and antibiotics should be used only if a pure or predominant growth of a pathogen is identified.^{4,5}

The main causative prepubertal vulvovaginitis agents are of respiratory origin. *Beta-hemolytic streptococci* and *H. influenzae* are likely following respiratory infections; it spreads by the oral-digital route to the genital area. The next most common pathogen isolated in these patients are *S.aureus* and *enterofecalis* each accounting for 12% due to contamination by the skin organisms, poor hygiene, and proximity of the vagina to the anus. The reported rate of *Candida* species isolated in prepubertal girls are accounting for 9.2%.⁶ In this study, we investigated the clinical findings of vulvovaginal infections in prepubertal girls admitted to our hospital and evaluated the vaginal culture results of the patients. We aimed to increase the awareness about microbiological agents of prepubertal vulvovaginitis and to contribute to the selection of appropriate treatments.

MATERIAL-METHODS

This study is a retrospective study. The medical records of children presenting to the pediatric outpatient clinic at our university hospital between January 2014 and January 2019 were systematically reviewed, and records of those diagnosed with vulvovaginitis were retrieved. Patients, who had information about the sexual maturation stage consistent with Tanner stage 1 in their files were included. Patients without vaginal culture results were excluded. Age, Tanner maturation stage, complaints of the patients, treatment modalities, vaginal culture results were collected from the files. Patients with a history of suspected sexual abuse or a suspected vaginal foreign body were excluded from the study. As a rule, all vaginal culture was taken by touching the inside of the labia and the posterior fossa with a moistened culture rod with sterile saline. Bacterial isolation in the microbiology laboratory was determined by automatic methods using Vitex2 device. Specimens with no bacterial growth were considered negative. Descriptive statistical methods were used. This study was approved by our Institute Research Medical Ethics Committee (approval number 1 November 2019, 9/22).

RESULTS

A total of 46 girls were included in the study. The mean age of the children was 82 ± 37.6 months. Initially all patients were seen and treated by another center. All of our patients were evaluated when their symptoms started and their treatments were given by the first application centers. All had a history of antifungal cream use. The mean time from onset of symptom to admission to our center was 4 ± 1.2 days. Twenty-two (47.8%) patients presented with two or more complaints. The reasons for admissions were shown in Table 1. Vaginal discharge and pruritus were the most common complaints. No growth was observed in 9 patients (19.6%). Microorganisms which are members of the skin and vaginal flora were positive in 34.8% of the patients. *Coagulase negative staphylococcus* was found in 11 patients (23.9%) and *diphtheroids* in 5 patients (10.9%). Culture results were positive in 11 patients (23.9%) for *E.coli*, in 4 patients (8.7%) for *Streptococcus pyogenes*, in 3 patients (6.5%) for *Gardnerella vaginalis*, in 2 patients (4.3%) for *Candida albicans* and in 1 patient (% 2.2) for *Enterobacter*. A cellophane tape test was performed in 15 (32.6%) patients. The test was positive in 5 patients (10.8%). Urine culture was obtained in 20 (43.5%) patients. 11 (23.9%) had simultaneous growth of *E. coli* with vaginal culture.

Table 1:Complaints of the patients on admission

| Complaints | Number, percentage |
|-------------------------------|--------------------|
| Vaginal Discharge | 10(21.7%) |
| Pruritus | 6(13.1%) |
| Eritem | 4(8.7%) |
| Foul Vaginal Odor | 2(4.3%) |
| Dysuria | 2(4.3%) |
| Two or more than two symptoms | 22(47.9%) |

DISCUSSION

While the most common cause of prepubertal vulvovaginitis was thought to be infections in the past, currently it is generally accepted that poor hygiene or nonspecific irritation is the main cause of vulvovaginitis in the prepubertal period.^{7,8} Most cases are nonspecific in origin and treatment includes only reassurance and improved vulvar hygiene. Vaginal discharge is the most common gynecological symptom in prepubertal girls with vulvovaginitis.

In a retrospective chart review study among 110 cases over 15 years period, the most common cause of discharge was associated with vulvovaginitis (82%).⁹ In our study vaginal discharge was the most common complaint and observed in 21.7% of the patients.

In our study, culture results were negative in 19.6% of patients. According to the field studies related to the subject, it has been reported that vaginal culture results were negative in 25-75% of the cases.³ Obesity, synthetic underwear and tights, washing with inappropriate detergent, use of perfumed soap, bath foam are additional risk factors for nonspecific vulvovaginitis.^{10,11} In patients with nonspecific vulvovaginitis, patients, and parents should be educated on proper hygiene and voiding techniques with the recommendation to avoid irritants. In our study parents were unsatisfied, they had to apply to our center about 4 days later their first applications. We concluded that if parents were educated, repeated hospital applications made at short intervals might be prevented.

In our study 2 patients (4.3%) had *Candida albicans* in the vaginal swabs. In a study, from Italy among 90 prepubertal children. *Candida* was not isolated in any of the patients.¹² In a retrospective study it was demonstrated that among 473 prepubertal children 32 patients had *Candida* (6.7%) infection.¹³

We observed that clinicians tended to prescribe antifungal cream to all prepubertal

children with symptoms of vulvovaginitis. In a study conducted among general practitioners in the UK, 41% of the surveyed physicians marked *Candida* as the most common cause of prepuberty vulvovaginitis is an indication of lack of knowledge on this subject.¹⁵ It is important to note that a yeast vulvitis may occur more often in infants and toddlers that are still in diapers or in patients with predisposing risk factors. The main known risk factors for vaginal candidiasis are; recent antibiotic use, increasing estrogen, diabetes, in girls over 9 years of age.^{13,14}

In our study, *S.pyogenes* was the second most common microorganism with a percentage of 8.7% after *E.coli*. In many studies, *S. pyogenes* has been shown to be the causative agent of vulvovaginitis in girls.^{4,15} It has also shown that patients can be asymptomatic perineal, nasopharyngeal, and gastrointestinal carriers of *S.pyogenes*. This bacteria is thought to be located in the gastrointestinal tract by autoinoculation or by ingestion of infected upper respiratory tract materials.¹⁶ According to related field studies, the prevalence of *S.pyogenes* in vaginal culture varies between 8% and 47%.⁵

In our study, *E.coli* growth was observed in 23.9% of the patients. In a study *E.coli* was the culprit agent in 7% of the patients with vulvovaginitis.⁸ In a different study, *E. coli* was the only found agent in 6.7% of the patients with persistent vaginitis.¹² *E.coli* is a member of the intestinal flora and is also a common bacteria in the culture results of girls with vulvovaginitis. It should be considered that this may also occur as contamination due to the close proximity of the anal area to the vaginal area. However, the presence of polymorphic leukocytes and the symptomatic condition with positive culture results, it may be considered as positive for vulvovaginitis.

In our study *coagulase negative staphylococcus* and *diphtheroids*, which were also can found as a normal skin flora member, was detected in 23.9% and in 10.9% of the patients respectively. It is known that members of the skin flora, do not cause disease in the vulvovaginal region where they are normally present, but we considered that due to facilitating factors members of the skin flora can cause infections on the irritated vulvovaginal region. Although the presence of leukocytes in the swab is in favor of bacterial infection this data was collected retrospectively and unfortunately, no leukocyte studies were performed in the swab.

In our study, only 32.6% of the cases were examined for oxyuria, and 23.9% of all cases were

found to have oxyuria as an indicator of poor hygiene.

It is important to know the culprit of the prepubertal vulvovaginitis, since, usually by the elimination of risk factors, simple hygienic measures are enough to solve the problem. Occasionally specific microorganisms that are different from the adults may cause vulvovaginitis. Therefore, it is essential to be aware of the differences of prepubertal vulvovaginitis from the postpubertal vulvovaginitis to maintain the right management by healthcare givers that are involved in prepubertal vulvovaginitis.

This research, however, is subject to several limitations. The main limitation of this study is being a retrospective study with limited number of patients (n=46). The strengths of this study were; all patients were from the same department and using rigorous method to get the vaginal culture according to the policy of the department made the results valuable and reliable.

CONCLUSIONS

The results of this study highlight the importance of an agent-specific treatment approach to patients with vulvovaginitis. The most important problem in the management of vulvovaginitis in prepubertal girls is to distinguish between nonspecific and specific causes of vulvovaginitis. Treatment should include counseling on hygiene and voiding techniques as well as therapy for any specific pathogens identified. Management of specific vulvovaginitis depends on the pathogenic organism isolated from vaginal culture. In this age group, most of the vaginal culture results are negative and the most frequently isolated pathogens are intestinal flora members and respiratory pathogens.

Conflict of Interest: Nothing to disclose

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