A Case Report of Prepubertal Vaginitis Caused by Streptococcus pyogenes

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Abstract

Microbiological examination and potential pathogens of vaginal samples are substantially different in the prepubertal, reproductive, lactation, and menopausal periods. Because vaginal samples are mostly from women during the reproductive age and frequently examined as though all patients are in the same age group, improper evaluations and consequent false reports or misdiagnoses might occur. To draw attention to such a mistake in the evaluation of vaginal samples, here we describe a 5-year-old patient with Group A Streptococcal vaginitis.

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Keywords: *Streptococcus pyogenes*, vaginitis, child

Introduction

The most frequent gynecological problem in prepubertal girls is vulvovaginitis. Due to anatomic factors, children at this age are particularly prone to vulvovaginitis. Proximity of vagina to anus, non-existence of labial fat pads and pubic hair, and atrophic vagina mucosa devoid of estrogen effect, frail vulvar skin and alkali vaginal pH leave vulva and vagina unprotected (1-4). Insufficient hygiene habits of children also contribute to the occurrence of infections (1, 2).

Vulvovaginal infections are considered differently both in terms of pathogens and investigation criteria of clinical samples in adult women and prepubertal age groups. Since vaginal samples in microbiology laboratories are tested in practice without any inquiry of patient age and clinic characteristics and evaluated as adult samples, there is a risk that the samples of children in prepubertal period and women in menopause may be misinterpreted and misreported.

In this study, we present a case study of a girl who was admitted to the pediatric clinic of our hospital and diagnosed with Group A Streptococcal vaginitis.

Case Report

A five-year old girl was admitted to our pediatrics outpatient clinic with complaints of vaginal discharge, itching and dysuria. Her history revealed a previous admission to another hospital and an attempt of oral sulbactam-ampisilin treatment which failed after a short period of recovery. In physical examination, it was found that the vulva was hyperemic and consequently the patient was consulted with gynecologists. Following the physical examination at the gynecology clinic, the trans-hymenal vaginal sample and urine sample were obtained and sent to Medical Microbiology Laboratory. The urine sample was also analyzed through standard methods in the Biochemical laboratories. Not only did we find any pathologic symptoms in the urine test, no growth occurred in the urine sample either. The Gram-stained vaginal sample obtained through the trans-hymenal method was examined by using Nugent criteria. Nugent

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score was specified as 4 and abundant neutrophil presence was observed. The same sample was inoculated onto human blood agar (HBA) and Sabouraud dextrose agar. After overnight incubation, abundant beta-hemolytic colonies were observed on HBA. In Gram-stain, Gram-positive cocci arranged in chains were observed and streptococcal identification was carried out by conventional tests.

The isolate was bacitracin susceptible, it failed to grow in salt broth and bile esculin medium, and CAMP (Christie, Atkins, Munch, Peterson) test was negative while PYR positive. Regarding the results of these tests and the examination with group specific antisera, the isolate was identified as Group A beta-hemolytic *streptococcus (Streptococcus pyogenes)*. Thereupon, the patient's age was inquired through the hospital automation system and found to be 5. Accordingly, Nugent scoring was cancelled, microbiological diagnosis was corrected and the patient's physicians were informed. However, as the patient did not turn up in our hospital again to collect her results, no follow-up or treatment was possible.

Discussion

Vagina flora and vaginitis factors vary in puberty period, in reproductive and post menopause periods. Lactobacilli are predominant in vagina flora of women in reproductive period. The *Candida spp.* and *Trichomonas vaginalis* are the most frequent agents in women in this period. *Gardnerella vaginalis*, *Prevotella*, *Porphyromonas*, *Bacteroides, Fusobacterium, Peptostreptococcus* and *Mobiluncus types*, and normal flora members such as *Mycoplasma hominis, Ureaplasma urealyticum and Atopobium vaginae* are responsible for the non-inflammation vaginitis caused by the breakdown in the flora (5).

In studies done with healthy children, the following were found as normal vaginal flora members; *anaerobics* such as *Actinomyces, Bifidobacteria, Peptococcus, Peptostreptococcus, Propionobacterium, Veionella, Bacteriodes, Fusobacteria,* and *aerobics* such as *Staphylococcus aureus, Streptococcus viridans, Enterococcus faecalis, Corynobacteria* (2, 3).

The most frequent agents of vulvovaginitis in prepubertal period are *Streptococcus pyogenes, Haemophilus influenza* and *Enterobius vermicularis* (2, 3). Dei et al. (2) divided the infective vulvovaginitis agents based on the data in the literature into three groups; pathogens, opportunistic pathogens and sexual related pathogens: Pathogens: *S. pyogenes, H. influenza, E. vermicularis, C. albicans/C. glabrata, Yersinia enterocolitica, Shigella flexneri;* Opportunistic pathogens*: S.aureus, Streptococcus agalactia, S. viridans, Escherichia coli, Enterococcus faecalis, Proteus mirabilis, Pseudomonos aeruginosa, Corynebacteria*; Sexual related pathogens: *Neisseria gonorrhoeae, Chlamydia trachomatis, and T. vaginalis* (2)*.* The role of *Candida* as the agent ofvulvovaginitis in prepubertal children already having toilet habit is small. In their study, Stricker et al. (6) found no case with *Candida* vulvovaginitis; Randelovic et al. (3) reported *Candida* as the agent in 2.4%; Jaquery et al. (7) isolated *Candida* as the agent in a case in whom prepubertal changes started. In studies related with vulvovaginitis etiologies, it was found that Candida vaginitis were more frequent in diapered infants, prepubertal age group in which hormonal changes started, children receiving antibiotic and steroid treatment and diabetic children.

S. pyogenes colonizes in the respiratory tracts of 5-15% of asymptomatic individuals. It is the most prevalent agent of pharyngitis in school age children and its various serotypes cause impetigo. In our study, *S. pyogenes* was isolated as the vulvovaginitis agent as well. According to the data in the literature, 8%-47% *S.pyogenes* was found in prepubertal patient sample (3). Previous studies revealed that *S. pyogenes* vulvovaginitiswere associated with previously experienced upper respiratory tract infection and skin infection and contaminates the genital region through autoinoculation (1-3, 8). *S. pyogenes* carriage-associated recurrent vulvovaginitis can be seen in children (2). The fact that *S. pyogenes* vulvovaginitis that recurred after a short period of recovery treated by sulbactam-ampicilline was seen in our patient makes us think that there was the presence of asymptomatic carriage in the pharynx in childhood or one of the family members. In recurrent *S. pyogenes*-associated vaginitis cases, it may be appropriate to test the throat culture of the child and family members in order to detect carriage.

In the studies in recent years, it was reported that *S. pyogenes* caused, though rarely, vaginitis in women within the reproductive period. Verstraelen et al*.* (9) found that these patients or some family members had a history of *S. pyogenes*-associated skin or respiratory tract infections or the presence of predisposing factors such as lactation or menopause-related vaginal atrophy and highlighted a different transmission route such as from a partner through sexual interaction (9).

The knowledge and information in the standard microbiologic diagnosis books regarding vulvovaginitis in prepuberty age group is limited. In a study done amongst general practitioners in England, the fact that 41% of the participating physicians in the survey ticked the option of *Candida* as the most frequent cause of prepuberty vulvovaginitis is an indication of the lack of knowledge and information in this subject (1). On the other hand, since vulvovaginitis agents are affected by the hormonal changes independent of age, it will be more appropriate,

in studies done to determine the etiology, to use the "Tanner Staging" which is used to evaluate pubertal development rather than chronologic age (6).

Discharge samples in children are taken from the vagina trans-hymenally. Cotton swap moisturized with physiological saline solution is gently swiped through the edge of hymen. Another way of taking the sample is to inject 1 mL physiological saline solution through the attachment of a thin urinary catheter within the vagina and sent it to the laboratory after aspiring this fluid (1, 2). Taking the sample from the vagina inlet may increase the fecal contamination. In their study, Randelovic et al. isolated 38% fecal-originated bacterium from the samples taken from the vagina inlet and stated that contamination might occur (3). However, Jaquiery et al. (7), despite taking the samples from the vagina inlet, reproduced the vaginal microorganisms composed of predominantly *Staphylococcus epidermidis*, diphtheroids and anaerobes and defended that the samples taken from the lower vagina or vagina inlet were simple, non-invasive and could yield beneficial results. In our patient, the discharge fluid sample was trans-vaginally taken from the back of hymen and no significant fecal contamination was found in Gram staining and culture. Furthermore, if the child has itching at night, considering that enterobius vermicularis-associated vulvovaginitis might occur, it has to be ensured that a sample has to be taken around the anus via cellophane band (2, 4).

It is sufficient to give women in reproductive age Gram-stained Nugent scoring in addition to direct microscopic examination for the diagnosis of vaginitis (10). Vagina culture increases the costs unnecessarily. However, in order to confirm the diagnosis in suspicious-vulvovaginal candidiasis or to detect few number fungi not visible in direct smear in infections not responding to the treatment or in recurrent infections, fungus culture may be used (11).

In the prepubertal age group, on the other hand, it is difficult to interpret the vaginal samples microbiologically. It is because normal flora may mask the potential pathogen (3). Although Gram staining is the simplest diagnosing technique in the diagnosis of vaginitis, there is limited number of studies in the literature regarding its status in examining the pediatric samples. In a study they carried out including children with vulvovaginitis, Stricker et al. (6) found that the sensitivity of the presence of leukocytes in vaginal secretions in terms of predicting the pathogenic bacterium production in culture was 83% and specificity 59% (6). This particular result may be interpreted as; the fact that leukocytes were present in the vaginal discharge fluid did not always indicate the presence of bacterial pathogen and infection; but, there might be a low possibility of infection in discharge fluid with no leukocytes. On the other hand, every organism isolated in culture cannot be considered as an infectious agent either. In addition to the pure and dominant reproduction of pathogenic agent in the culture, there have to be the presence of symptoms and findings confirming an inflammation, as well (7). The clinic and microbiologic characteristics of the patient have to be evaluated together before making the diagnosis of infection (4).

The fact that infectious vaginitis agents vary in relation to age, pubertal development, lactation and menopause may cause some misdiagnoses in microbiology laboratories. Since most of the vaginal samples in our hospital's laboratory were those of adults, the vaginal sample was Gram-stained and examined using Nugent criteria without any inquiry of patient age. It was found that lactobacillus disappeared and the score of sample with abundant neutrophils was 4.

After overnight incubation, since pure and abundant beta-hemolytic colonies were observed on HBA, the patient's age was inquired through the hospital automation system and found to be 5. Under these circumstances, Nugent scoring was cancelled. The samples examined without the knowledge of age, lactation and menopause status of the patient may be reported as contaminated or insufficient samples, and patient's treatment may be delayed. Before examining the vaginal samples, the microbiologist should be informed about the relevant information of the patient, arrange the diagnosis algorithm accordingly and should be given appropriate medium (including sheep blood agar and chocolate agar) culture test in necessary.

Conclusion

In conclusion, both as a result of scarcity of patients and the fact that the standard document failed to emphasize appropriately, it is a potential, and sometimes practically implemented health problem that vaginal samples of prepuberty and post-menopause women were not examined and reported , just like those of reproductive period, due to negligence and rooted habits. The case we have presented is a typical and frequent example. In microbiological examination of vaginal samples, the age of the patient should definitely be taken into consideration; if early and late puberty, extended lactation and menopause is in question or one of the clinical circumstances that might affect the vaginal microbiology occurs, the physician monitoring the patient should categorically inform the laboratory of this particular issue.

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