

## **STREPTOCOCCUS PYOGENES AS THE CAUSE OF VULVOVAGINITIS IN ADULT WOMEN**

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According to the literature data, *Streptococcus pyogenes* is the most common cause of infectious vulvovaginitis in prepubertal girls, but it is rarely described in adult women.

In this paper we report the prevalence of *S. pyogenes* vulvovaginitis in adult women in the municipality of Niš, Serbia, in a five-year period. The total of 42.259 women with symptoms of vulvovaginal infection were enrolled in the study and their swabs from the vagina and cervix were examined using the standard microbiological procedures: direct microscopy of Gram stained preparations and sample culture. Women with positive *S. pyogenes* findings were later contacted to give anamnestic data and for post-treatment control examinations.

*S. pyogenes* was isolated from the samples of 2 patients: in July 2012 in a 20-year-old woman with the anamnesis of a previously diagnosed tonsillopharyngitis, and in May 2015 in a 32-year-old breast-feeding woman. These patients had the signs and symptoms of acute inflammation: vaginal and vulvar pain, dyspareunia, burning sensation, pruritus, and a profuse, watery, yellow vaginal discharge. Gram staining revealed abundant segmented WBCs and gram-positive cocci in pairs and chains. After the administered penicillin therapy, the control microbiological examinations of the vaginal and cervical swabs were done, as well as the throat swab culture for the presence of *S. pyogenes*, and all the results were negative.

Streptococcal vulvovaginitis in adult women was diagnosed in only two examinees in our study and was associated with a predisposing factors: personal history of a respiratory infection and lactational vaginal atrophy. *Acta Medica Medianae* 2016;55(4):82-85.

**Key words:** *Streptococcus pyogenes*; vulvovaginitis; women

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ginitis is rarely described in adult women (6, 7) and is often associated with a predisposing factor: a household or personal history of dermal or respiratory infection due to *S. pyogenes*, sexual contact, and lactational or menopausal vaginal atrophy (8).

The purpose of this study is to give an overview of the prevalence of *S. pyogenes* genital infection in adult women with vulvovaginitis symptoms and association of certain risk factors with this form of infection in the municipality of Niš, Serbia.

### **Introduction**

*Streptococcus pyogenes* (*S. pyogenes*) is the most common cause of tonsillopharyngitis but has also been implicated as an etiological agent of perineal infections in children: perianal infections, vulvovaginitis and balanitis (1, 2). According to the literature data, *S. pyogenes* is the most common cause of infectious vulvovaginitis in prepubertal girls (1-5). In contrast, *S. pyogenes* vulvova-

### **Methods**

The study was done at the Center of Microbiology, Institute of Public Health Niš, in the period from January 1, 2011 to December 31, 2015. The total of 42.259 patients referred to the Center by their gynecologists because of the symptoms of a vulvovaginal infection, were enrolled in the study. The swabs from the vagina and cervix were obtained in our out-patient department and

examined in the Laboratory for sexually transmitted diseases of the Center of Microbiology. According to the standard procedures, our microbiological examination of the collected samples involved direct microscopy of Gram stained preparations and sample culture on Columbia agar with 5% sheep blood incubated in ambient air and chocolate agar incubated in an atmosphere enriched with 5% of carbon dioxide, at 37°C. The isolates were identified as being *S. pyogenes* by their colony morphology,  $\beta$ -haemolysis on blood agar plates, bacitracin susceptibility using the Bacitracin Low Diagnostic Tablets (Rosco Diagnostica, Taastrup, Denmark), agglutination with specific group A antisera (Slidex, Streptokit; bio-Merieux, Marcy l'Etoile, France) and The BBL Crystal™ Gram-Positive (GP) Identification System (Becton Dickinson, USA). Kirby-Bauer antimicrobial susceptibility testing was performed by disk diffusion on Müeller-Hinton agar supplemented with 5% defibrinated sheep blood, according to the guidelines of the Clinical and Laboratory Standards Institute (9). Women with positive *S. pyogenes* findings were later contacted to give anamnestic data and for post-treatment control examinations.

## Results

In the five-year study period, *S. pyogenes* was isolated from samples of 2 patients: in a 20-year-old woman in July 2012, and in a 32-year-old woman in May 2015. Patients with this streptococcal infection had the signs and symptoms of acute inflammation: vaginal and vulvar pain, dyspareunia, burning sensation, pruritus, and profuse, watery, yellow vaginal discharge. Gram staining revealed abundant segmented WBCs, gram-positive cocci in pairs and chains, and a notable absence of Lactobacillus-like gram-positive rods. The patient's culture grew *S. pyogenes*, one resistant to bacitracin. The isolated *S. pyogenes* strains were sensitive to penicillin and resistant to erythromycin, clindamycin, tetracyclin and quinolones.

It should be mentioned, regarding the association of certain risk factors with this form of infection, that the 20-year-old woman in her anamnesis gave the information of a previously diagnosed tonsillopharyngitis. The second patient, a 32-year-old woman was 6 months postpartum breast-feeding and was experiencing lactational amenorrhea. After the administered penicillin therapy, good outcomes of the disease were observed in both patients considering the fact that *S. pyogenes* was not isolated in control microbiological examinations of the vaginal and cervical swabs, as well as the throat swab culture, and patients were without symptoms of vulvovaginitis.

## Discussion

In adult women, *S. pyogenes* vaginal carrier state has been described, but vulvovaginitis is

rarely reported (10). In their case-control study, Bruins et al. investigated the association between non-group B  $\beta$ -haemolytic streptococci and vulvovaginitis in adult women and *S. pyogenes* was isolated in 4.9% of women with recurrent vaginal discharge, but none from the controls (5). Mead et al. found that a vaginal-rectal colonization rate with *S. pyogenes* in late pregnancy was a rare event (0.03%) (11).

In their systematic literature search, Verstraelen et al. identified nine case reports covering 12 patients with documented *S. pyogenes* vulvovaginitis in a ten-year period (8). Verkaeren et al. described the case of a 64-year-old woman with the presentation of endometritis revealed by *S. pyogenes* bacteraemia, followed by recurrent vulvovaginitis (6). Ugurlu et al. reported a 59-year-old patient with high fever, lower abdominal pain and *S. pyogenes* vulvovaginitis, suggesting that vaginal atrophy can play a significant role in the pathogenesis of this infection (12). Sobel et al. reported 2 cases of recurrent *S. pyogenes* vulvovaginitis, a 42-year-old woman and a 39-year-old woman, whose husbands were gastrointestinal carriers of *S. pyogenes* (10). Meltzer et al. reported a case of *S. pyogenes* vulvovaginitis in a 32-year-old woman who was 6 months postpartum and was experiencing lactational amenorrhea (7). Rahangdale et al. reported 2 cases of adult women, a 33-year-old multiparous woman and a 46-year-old primiparous woman with *S. pyogenes* associated vulvovaginitis in the setting of breastfeeding (13). Fisk and Riley reported a case in which both the husband and his wife had GAS genital infections after engaging in both oral and vaginal sex while the wife had pharyngitis (14).

*S. pyogenes* vulvovaginitis in adult women is often associated with a household or personal history of dermal or respiratory infection due to *S. pyogenes*. The carriage or exposure to a carrier is an important pathogenic factor in recurrent *S. pyogenes* infection (7). Sobel et al. reported 2 cases of recurrent streptococcal vulvovaginitis in which the gastrointestinal tracts of the patients' husbands were colonized with *S. pyogenes* (10). Verkaeren et al. described a patient whose husband was found to be an asymptomatic carrier, after *S. pyogenes* was identified in nasal and rectal swabs (6). Meltzer et al. reported that the patient's husband had been ill with an upper respiratory tract infection at the time of sexual contact (7). This case appears to be somewhat unusual, because *S. pyogenes* genital infection was sexually transmitted. These cases reiterate the necessity for an adequate screening of the patient's family and contacts in cases of recurrent *S. pyogenes* infection by culturing the material from all areas potentially infected with *S. pyogenes*.

Low estrogen levels in postmenopausal and postpartum women increase the susceptibility of vaginal mucosa to infection. A decrease in Lactobacillus species, and an increase in vaginal pH are

characterized by dyspareunia, vaginal stinging and tightness, dysuria, vaginal color change, and increase in parabasal cells. These conditions are called senile vaginal atrophy in postmenopausal women and postpartum vaginal atrophy in postpartum women (7, 13, 15). In our study, *S. pyogenes* vulvovaginitis was associated with a predisposing factor: personal history of respiratory infection and lactational vaginal atrophy.

Clinically, streptococcal vulvovaginitis is characterized by the signs and symptoms of an acute infection: burning sensation, painful erythematous vulva and vagina, dyspareunia with profuse, watery, yellow and occasionally serosanguineous vaginal discharge (7, 8). In our study, both examinees with *S. pyogenes* infection had a clinically manifest inflammatory reaction and Gram staining revealed large numbers of segmented WBCs. Sensitivity to bacitracin is routinely used in the preliminary identification of *S. pyogenes*, but some resistant strains have been described in several countries. In Portugal, Friães et al. reported a resistance to bacitracin in 5% of *S. pyogenes* strains (16). In our study, one strain was resistant to bacitracin which should be borne in mind in routine microbiological identification of *S. pyogenes* strains.

The drug of choice in the therapy of non-complicated *S. pyogenes* infections is oral peni-

cillin for 10–14 days or 2% clindamycin cream per vaginam for 7–10 days. A possible resistance of *S. pyogenes* strains to macrolides should also be considered, since macrolides are used as an alternative in the therapy of streptococcal infections. In our study, a resistance to erythromycin was found in both isolates, expressing cMLSB resistance. In the cases of marked vaginal atrophy, as may be seen postpartum in breastfeeding women or in postmenopausal women, the treatment with local estriol cream or ovules may be necessary to prevent the recurrence of *S. pyogenes* vulvovaginitis (8, 12, 13). Antibiotic prophylaxis including rifampin and amoxicillin was demonstrated to be efficient in eradicating pharyngeal carriage of *S. pyogenes* (6).

Based on the results of this study, a conclusion may be drawn that *S. pyogenes* vulvovaginitis in adult women is very rare and associated with a predisposing factor: personal history of respiratory infection and lactational vaginal atrophy. Nevertheless, due to the severity of clinical signs and symptoms and possible relapses, these infections deserve special attention of gynecologists. Mandatory microbiological examinations are therefore recommended, as well as their close follow-up all the way to the complete cure, and health education work.

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## Revijalni rad

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# STREPTOCOCCUS PYOGENES KAO UZROČNIK VULVOVAGINITISA KOD ŽENA

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Prema podacima iz literature, *Streptococcus pyogenes* je najčešći izazivač vulvovaginitisa kod djevojčica pre puberteta, ali je retko opisan kod žena.

U ovom radu je prikazana prevalencija *S. pyogenes* vulvovaginitisa kod žena na području Niša, u Srbiji, u petogodišnjem periodu. U studiju je uključeno 42259 žena sa simptomima vulvovaginalne infekcije, a njihovi brisevi vagine i cerviksa pregledani su primenom standardnih mikrobioloških procedura: mikroskopiranjem direktnih preparata obojenih po Gramu i kultivacijom uzoraka. Žene sa nalazom *S. pyogenes* su kasnije kontaktirane zbog anamnestičkih podataka i kontrolnih pregleda nakon terapije.

*S. pyogenes* je izolovan iz uzoraka dveju ispitanica: jula 2012. godine kod 20-godišnje žene sa anamnezom o prethodno dijagnostikovanom tonzilofaringitisom i maja 2015. godine kod 32-godišnje dojilje. Ove bolesnice su imale znake i simptome akutnog zapaljenja: bol u vagini i vulvi, dispareuniju, osećaj pečenja, svrab i obilan vodeni, žut vaginalni sekret. Na preparatu obojenom po Gramu uočen je veliki broj PMN leukocita, kao i gram pozitivne koke u parovima i lancima. Posle primene penicilinske terapije, rađen je kontrolni mikrobiološki pregled vaginalnog i cervikalnog brisa, kao i brisa grla na prisustvo *S.pyogenes* i svi rezultati su bili negativni.

U našem istraživanju streptokokni vulvovaginitis dijagnostikovao je samo kod dve ispitanice i povezan je sa predisponirajućim faktorima: ličnom anamnezom o respiratornoj infekciji i laktacijskom atrofijom vagine. *Acta Medica Medianae* 2016;55(4):82-85.

**Ključne reči:** *Streptococcus pyogenes*, vulvovaginitis, žene