

Personal Hygiene and Vulvovaginitis in Prepubertal Children



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ABSTRACT

Study Objective: To determine and compare clinical and microbiological features of vulvovaginitis in prepubertal girls. Vulvovaginitis is the most common gynecological problem of childhood.

Design, Setting, Participants, Interventions, and Main Outcome Measures: This study involved 45 girls from 2-12 (5.38 ± 2.9) years old; and 26 girls from 3-12 (5.72 ± 3.1) years old as a control group. Anamnesis and physical examination were followed by vaginal smear, urine culture, and stool analyses from both groups, and the personal hygiene status and education level of the mother were determined.

Results: The most common symptoms among the patients were vaginal discharge (44.4%), vulvar erythema (37.8%), and vaginal itch (24.4%). Microorganisms, isolated from vaginal smears, were detected in 48.9% of the patients. *Escherichia coli* was shown in the urine culture of 3 patients with vulvovaginitis (6.70%). In microscopic stool analysis parasites were detected (45.9%). We found some relevant personal hygiene factors, such as wiping back to front (42.9%), cleaning by herself after defecation (89.3%), using toilet paper (60.7%) and wet wipes (21.4%), and bathing standing (14.3%) and sitting (46.4%) among patients. The questionnaire also showed that the children wore tight clothing (35.7%).

Conclusion: Our findings suggest that vulvovaginitis in prepubertal girls is related not only to microorganisms but also poor personal hygiene, the educational status of mothers, and specific irritants.

Key Words: Prepubertal girls, Vaginal discharge, Vulvovaginitis, Personal hygiene

Introduction

Although the actual incidence is unknown, vulvovaginitis is considered to be the most common gynecological problem in children and adolescents. Many factors can contribute to inflammation in the genital area. These factors include introitus less protected by arrangement of the labia majora, irritation of the vaginal mucosa, and low estrogen concentration, which leaves the patient susceptible to infection, exposure to irritants (bubble bath), poor hygiene, and infection by specific pathogens. If symptoms such as vaginal discharge, dysuria, inflammation, itching, and vulvar erythema are present, it is a case of vulvovaginitis.¹⁻⁴

The proximity of the anus and vagina can cause contamination by fecal bacteria. Also, prepubertal girls lack protective labial fat pads and pubic hair. In addition, one effect of estrogen in puberty is to thicken the vaginal mucosa and thus reduce the incidence of potential infections and vaginitis.²⁻⁷

Approximately 75% cases of vaginitis in prepuberty are nonspecific vaginitis.⁷ In cases of nonspecific vaginitis, coliform bacteria, *Escherichia coli*, enterococci, anaerobic diphtheroids, and microorganisms such as bacteria that suggest fecal contamination are the most common

microorganisms. Many scientists think that inadequate hygiene and tight clothing (nylon underwear, tights, and plastic-coated paper diapers) might have a role in the development of nonspecific vaginitis. Another common factor is exposure to irritants such as perfumed cleaning supplies in laundry and bathing, and in soap (vigorously rubbing the genital area with soap). Thus, mildly irritating chemicals deposited at the entrance of the vagina cause chemical vaginitis and/or irritant vaginitis. Then, superinfection with local microorganisms can develop.⁸⁻¹⁰

The aim of this study was to determine and compare the clinical and microbiological features of vulvovaginitis and to clarify the contribution of clinical and environmental factors and infection to the etiology of vulvovaginitis in prepubertal girls.

Materials and Methods

This study was approved by the Human Research Ethics Committee at the Yuzuncu Yil University Medical School and conducted in accordance with the Declaration of Helsinki. Parents were informed about the study, and informed written consent was obtained from each before the start of the study.

Patients who presented to the children's health and disease clinic in the faculty of medicine research and training hospital were admitted to this study. Forty-five girls who were beyond the diaper stage and who presented with complaints such as redness in the genital area, pain, burning, tenderness, itching, and vaginal discharge

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were diagnosed with vulvovaginitis and admitted as a patient group. Girls aged 2–12 years at prepubertal status Tanner stage I with absence of secondary sexual characteristics, and with typical complaints and symptoms of vulvovaginitis, were enrolled in the study.

The control group was randomly selected for this study. Girls included in the control group were of prepubertal age and at Tanner stage I. The 26 girls had no gynecological complaints, no history of sexual abuse, and no systemic antibiotic therapy.

The families of the children included in this study were informed about the study. The required permissions were obtained for the examination and laboratory tests. The detailed histories of individuals in both groups were taken and clinical information and laboratory findings were recorded. The urine, vaginal cultures, and stool samples were collected carefully from children.

Precautions were taken in the prepubertal girls to prevent contamination of the urine with vaginal discharge. When urine was collected from small children who could not control their bladder sphincter, special sterile containers were used. Any contact with the container's interior walls was avoided. A midstream sample was the appropriate specimen for a urine culture: urine was collected after the first brief miction was discarded and before the miction was completed. The container was immediately sent to the laboratory for analysis. The samples were inoculated onto 5% sheep blood-brain heart infusion agar (Difco), and eosin methylene blue agar (Difco) medium in the microbiology laboratory. Pathogen identification and antimicrobial susceptibility tests were examined using Sceptor panels (Becton–Dickinson).

Stool samples were collected from all of the asymptomatic girls and the symptomatic girls. After being placed into stool containers, the samples were examined using direct microscopy in the parasitology laboratory. In the early morning of 3 consecutive days, a tape test for pinworms was taken from the perineal area of every child with anal itching, spread on a slide, and examined under a microscope.

The vaginal cultures were taken by establishing with the child and the child's family good relations and trust for the examinations and investigations. Then the patient was laid on the examination table frog-legged in the supine position. In the physical examination, without use of auxiliary tools like speculum and otoscope, the child's prepubertal status, skin disease, type of stream, and the condition of the vulva and vagina were determined. The child's mother provided assistance during this process. The swab cultures were taken to detect ureaplasma and mycoplasma using specially prepared cotton-tipped sterile, wooden swabs as a transport medium. The resulting samples were immediately sent to the microbiology laboratory for cultivation.

The data obtained from the patient and control groups were compared. Statistical analysis was performed with SPSS version 20.0. The χ^2 test was used to compare categorical variables and Student *t* test was applied for continuous variables of the treatment groups. For statistical significance, a *P* value of .05 was accepted. The average of the data and standard deviation of patients and control subjects were shown as $X \pm SD$.

Results

The patient group was comprised of 45 girls from 2–12 years of age who complained of vaginal discharge; the control group was comprised of 26 girls from 3–12 years of age. The mean age of children belonging to the patient group was 5.38 ± 2.9 years, and in the control group this value was 5.72 ± 3.1 years. A statistically significant difference was not determined between the ages of patient and control groups included in this study ($P > .05$). Clinical symptoms of patients who were diagnosed with vulvovaginitis are shown in Table 1. Microorganisms isolated from the cultures are summarized in Table 2. The stool microscopy results of stool samples obtained from patients and control groups are shown in Table 3. *Giardia intestinalis* was detected in 6 children (13.3%) in the patient group and 2 children (7.7%) in the control group. *Blastocystis hominis* was determined in 3 (6.7%) diseased children and 2 children (7.7%) in the control group. *Enterobius vermicularis* and *Ascaris lumbricoides* were found in 10 children (22.2%) and one (2.2%) child, respectively, in the patient group, and these parasites were not found in the control group. *Trichuris trichiura* and *iodamoeba butschlii* were not detected in the patient group. However, it was seen in 1 child (3.8%) in the control group. The educational status of the children's mothers is shown in detail in Table 4. Hygiene information on patients whose cultures contained microorganisms are shown in Table 5. Microorganisms were detected in vagina and/or urine cultures of 10 girls (35.7 %) who use tight underwear and tights, in 12 girls (42.9 %) who clean themselves from the back to the front, in 25 children (89.3%) who clean themselves after the toilet, in 4 children (14.3 %) who have a bath while standing, in 13 children (46.4 %) who have a bath while sitting, in 6 children (21.4 %) who have a bath in a bathtub-basin, in 6 children (21.4 %) who use wet wipes, and in 17 children (60.7%) who use toilet paper.

Discussion

Prepubertal girls are anatomically, physiologically, and behaviorally exposed to an increased risk of developing vulvovaginitis. Vaginal discharge is the most common

Table 1
Clinical Symptoms of the Patients With Vulvovaginitis

Clinical Symptom	Prepubertal Group: Average age, 5.38 Years (Range, 2–12 Years; n = 45)	%
Vaginal discharge	20	44.4
Watery discharge from mouth	18	40.0
Vulvar erythema	17	37.8
Anal itching	16	35.6
Dysuria	15	33.3
Odor in discharge	14	31.1
Vaginal itching	11	24.4
Abdominal pain	12	26.7
Parasite history	12	26.7
History of urinary tract infection	9	20.0
Vaginitis treatment received	5	11.1
Enuresis	6	13.3
Perineal pain and/or burning during urination	3	6.3
Encopresis	1	2.1

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