

The Role of Catheter-within-a-Catheter Technique in Premenarchal Vulvovaginitis

Mohammad Khalaf Daboubi, MD*
Abdel Elah Farraj, MD* Muna Zoubi, BSc**

Objective: The study aims to identify the microorganisms causing vulvovaginitis in premenarchal girls by using the catheter-within-a-catheter technique compared with swab technique for taking samples from vaginal discharge for smear and culture.

Methods: A retrospective study was done in 60 cases of premenarchal vulvovaginitis who underwent clinical assessment through history taking, clinical examination and investigation of vulvovaginal discharge for smear and routine swab culture of anaerobic and aerobic bacteria. All cases had smears and swabs for culture taken by using the catheter-within-a-catheter technique, under sterile conditions as a comparison in a 24-month period.

Setting: King Hussein Medical Center.

Results: By using swab smear and culture only, the most common pathogens involved in the disease were nonspecific (mixed growth) in 40% followed by candida sp in 11.7% and E.coli in 5%. However, by using catheter-within-a-catheter technique, the most common pathogens isolated were candida sp in 25% followed by nonspecific (mixed growth) in 20%. Enterobacteria (E.coli, Klebsiella, Proteus) in 12%, Streptococci in 5%, and Trichomonas in 3.3% of the 60 cases with premenarchal vulvovaginitis.

Conclusion: It is useful, when evaluating a child with blood tinged vaginal discharge in whom nonspecific (mixed growth), and/or no organisms were isolated on repeated cultures, to use the catheter-within-a-catheter technique to obtain a smear and culture of upper vaginal secretion as this helps more in a single organism isolation.

Bahrain Med Bull 2000;22(2):

Vulvovaginitis is the most common of all outpatient gynaecologic problems and accounts for 10% of office visits annually for the primary care providers¹, and more than 70% of gynaecological cases, in the pediatric group, occurring primarily because of poor perianal hygiene and improper wiping after bowel movements²⁻⁵. Transmission of bacteria from the rectal area to the vulvovaginal area often results in

* Gynaecologist and Obstetrician – Jordanian Board
Gynaecology Department

** Medical Laboratory
King Hussein Medical Center
Amman
Jordan

problems such as pruritis, burning, erythema and discharge as a result of poor hygiene^{2,4}. By using current knowledge and simple office laboratory methods, a precise etiologic diagnosis can be made in more than 95% of patients, and the approach to diagnosing the patients with vulvovaginitis consists of a careful history, pelvic examination and microscopic examination and culture of the vaginal discharge^{6,7}. The majority of problems little girls have with their reproductive tract are localized in the vagina and the vulva, symptoms are rarely given precisely, but fortunately, in majority of the cases the diagnosis can be made by a simple visual examination. The nonestrogenized prepubertal female genitalia does not readily tolerate instrumentation and speculum examination or bimanual examination are inappropriate^{3,9}. Cotton tipped swabs are so abrasive to the atrophic mucosa that the cooperative child will allow the examiner only one attempt at obtaining intravaginal secretion⁹. If the child is uncooperative, there is a real danger that minor damage to the hymen and vulval tissue might occur if the child inadvertently moves. Studies performed on secretions obtained from the vestibule may not be representative of the pathologic organisms in the vagina.

The aim of our study was to evaluate the catheter-within-a-catheter technique for taking samples from the vaginal discharge for smear and cultures and to compare this technique to swab smear and culture. We also planned to identify the microorganisms causing vulvovaginitis in premenarchal girls.

METHOD

During a 24-month period (February 1996 to February 1998) 60 cases of premenarchal girls were referred to our gynaecological clinics from the pediatric clinics. History was taken from the patients or their mothers. The chief complaint was vulvovaginal discharge associated with or without smell, itching and or vulval skin changes. A thorough assessment through history taking, clinical examination and investigations was done for all patients. We took vaginal swabs in the usual way and by catheter-within-a-catheter technique from the vaginal discharge for microscopic examination and anaerobic and aerobic cultures.

By the catheter-within-a-catheter method we obtained vaginal secretions in an atraumatic manner. Using a sterile technique, two separate short catheters can be obtained by excising the distal 4 inches of a soft, size 12 bladder catheter, and the proximal 4 inches of butterfly intravenous tubing. Still using aseptic precautions, the proximal 4 inches of butterfly IV tubing is placed inside the distal 4 inches of the bladder catheter. A small size syringe with 0.5 to 1.0 ml of aspirating fluid is attached to the rubber of the butterfly tubing (Figure 1). The outer catheter keeps the vaginal walls from being sucked against the inner catheter, so that most of the aspirating fluid can be flushed in and out of the upper vagina several times before it is aspirated back into the syringe prior to removing the whole apparatus from the vagina. This technique will provide enough material for a wet mount, Gram's stain, forensic studies and multiple cultures^{9,10}.

3 ml syringe

4' - #12 Red rubber catheter

4.5' Butterfly catheter

Figure 1. Catheter within-a-catheter used to atraumatically aspirate secretions from the prepubertal vagina. From Pokorny SF, Stoimer J. Atraumatic removal of secretions from the prepubertal vagina. Am J Obstet Gynecol 1987;156:581-2.

For all patients, urine analysis including cultures and stool analysis were done and gonorrheal study (smear and culture) were performed for some cases according to their complaints, history and clinical findings. Chlamydial studies were not done in our study to rule out this infection, because of the difficulty in diagnosis, the expense of the investigation and also due to its non-availability.

No child had any systemic diseases that may have caused vulvovaginitis (DM, Rheumatoid arthritis, lupus, Hodgkin disease, Leukemia, Psoriasis Eczema and or congenital abnormality).

RESULTS

The presenting symptoms and findings on examination are shown in Table 1. Vaginal discharge was the most common symptom, presenting in 33 cases out of 60 (55%) and genital redness was the most common sign, presenting in 48 cases (80%). Table 2 shows the etiology and microorganisms from the 60 cases by using ordinary swabs for culture of the vulval and vaginal secretion. The most common organisms were nonspecific growth (mixed growth) in 24 cases out of 60 (40%), followed by candida sp in 7 cases (11.7%), E.coli in 3 cases (5%). Enterobius verminularis in 4 cases (6.7%), no growth in 12 cases (20%). No case of Gonorrhea, Streptococci, Staph.aureus, Klebsiella, Proteus or Trichomonas was found.

Table 1. **Clinical Features of Children presenting with Vulvovaginitis.**

<i>Feature</i>	<i>No (%)</i>
Symptoms	
Itching	27 (45%)
Soreness	30 (50%)
Bleeding	12 (20%)
Discharge	33 (55%)
Signs	
Genital redness	48 (80%)
Visible discharge	30 (50%)
Perineal soiling	18 (30%)
None	10 (17%)

Table 2 also shows the etiology and microorganisms from the 60 cases by using the catheter-within-a-catheter technique for smear and cultures. The most common organism found was candida sp in 15 cases out of 60 (25%), followed by nonspecific growth (mixed growth) in 12 cases (20%), Enterobacteria (E.coli, Klebsiella, Proteus) in 7 cases (12%) and of these 5 grow E.coli (8.3%). Enterobius vermicularis was seen in 4 cases (6.7%), no growth in 6 cases (10%), Streptococcus B-hemolytic group D in 3 cases (5%), Staph.aureus in one case (1.7%) and Trichomonas vaginalis in 2 cases (3.3%). No case of gonorrhoea was detected.

Table 2. Etiology and Age Distribution for 60 cases of premenarchal vulvovaginitis by using swabs and catheter-within-a-catheter technique.

Etiology	Swab No %	Catheter-within-a- catheter technique No (%)	Average Age (years)
Non-specific (mixed growth)	24 (40)	12 (20)	9.1
No growth	12 (20)	6 (10)	6.5
Candida sp	7 (11.7)	15 (25)	12.1
E.coli	3 (5)	5 (8.3)	4.8
B-hemolytic streptococci group D	0 (0)	3 (5)	7
Klebsiella sp	0 (0)	1 (1.7)	7.5
Proteus sp	0 (0)	1 (1.7)	8
Staph aureus	0 (0)	1 (1.7)	9
Trichomonas	0 (0)	2 (3.3)	10.5
Gonococci	0 (0)	0 (0.0)	--
Enterobius vermicularis (no growth)	4 (6.6)	4 (6.6)	6.2
Foreign body (Mixed growth)	2 (3.3)	2 (3.3)	4.8
Physiologic	8 (13.4)	8 (13.4)	1.1
Total	60 (100)	60 (100)	

Physiological causes of vulvovaginitis were found in 8 cases out of 60 (13.4%) by using both methods of obtaining vaginal discharge. They were considered physiological by the following criteria: 1) Vulvovaginal discharge. 2) No symptoms or signs of infection or inflammation. 3) No growth on repeated cultures.

Foreign objects were detected in 2 cases out of 60 (3.3%), both of them were wads of toilet paper, and cultures by using swabs and catheter in catheter technique showed mixed growth in both cases. Urine analysis and culture revealed positive cultures in 6 cases out of 48, E.coli in 4 cases, Proteus in one case and Staph. aureus in one case. Stool analysis revealed Enterobius vermicularis in 4 cases out of 20 and in these 4 cases the cultures of vaginal secretions using both methods revealed no microorganisms. No case was found to have a systemic disease that may have caused the vulvovaginitis (eg. DM, Rheumatoid arthritis, lupus, Hodgkin disease, Leukemia, Psoriasis or Eczema) and or any congenital abnormality. The age groups of patients presenting with vulvovaginitis is also shown in Table 2.

DISCUSSION

Vulvovaginitis has many causes in young girls, especially in the 3-8 years age range. In these girls the hygiene is poor, the soreness and itching leads to rubbing or scratching, thereby causing infection in the already compromised skin^{2-4,9,15}. Enterobacteria (E-coli, Klebsiella, Proteus) was found in cases with poor hygiene²⁻⁴, and almost all of them presented with underwear soaked by urine. Simple measures to improve hygiene and education can give effective relief¹¹. The thread worms are said to be a common cause of vulvovaginitis in premenarchal girls^{3,14}, and in our study all the cases of thread worm vaginitis, were also positive for stool analysis. Many types of foreign bodies have been discovered in the vagina causing vulvovaginitis in premenarchal girls. The most common are small wads of toilet paper as seen in both the girls with foreign body in our study with resulting infections and or inflammatory response^{3,10-12}. By using the catheter-within-a-catheter technique for taking samples from the vaginal lavage for smear and culture, Candida sp was seen to be the most common cause of vulvovaginitis in our study. By this method the number of cases picked up were double than those diagnosed by the ordinary swab for smear and culture. The average age of the girls with candidiasis was 12.1 years. This is the age at which the vaginal mucosa is subjected to the effect of oestrogen and the glycogen content increases^{3,9,10}. We also succeeded in reducing the number of non-specific growth (mixed growth) and no growth results almost by half by using the catheter-within-a-catheter technique (Table 3). More single organisms were isolated (E.coli, B-hemolytic Strept.group D, Staph-aureus, Proteus, Klebsiella and Trichomonas vaginalis) by this method than by the use of swab smear and culture of vaginal discharge (Table 3). We found no gonococci in our study, although they have been found by others in a fewer cases¹³.

Table 3. Results of cultures by the two methods.

<i>Method</i>	<i>Swabs culture</i>		<i>Catheter in catheter method</i>	
	<i>No</i>	<i>%</i>	<i>No</i>	<i>%</i>
Mixed growth	26	43.3	14	23.3
Single organism	14	23.3	28	46.6
No growth	20	33.3	18	30.0
Total	60	100	60	100

CONCLUSION

In conclusion, it is useful, when evaluating a child with blood tinged vaginal discharge where nonspecific growth (mixed growth) and/or no organisms were isolated on repeated cultures to use the catheter-within-a-catheter technique to obtain a smear and culture of upper vaginal secretions. This method helps to isolate single organisms, more frequently as seen in the results of our study (Table 3).

REFERENCES

1. Willard M. Vulvovaginitis. A concise guide to office diagnosis and treatment. *Female pt* 1994;19:52.
2. Muram D, Massouda D. Vaginal bleeding in children. *Contemp Obs/Gyn* 1985;26:41.
3. Arsenault PS, Gerbie AB. Vulvovaginitis in the pre-adolescent girl. *Pediatr Ann* 1986;15: 577-85.
4. O'Brien TJ. Paediatric vulvovaginitis. *Australas J Dermatol* 1995;36:216-8.
5. Daboubi MK, Barqawi R, Keelani Z. Vulvovaginitis in premenarchal girls. *Jordan Med J* 1995;29:82-4.
6. Koumantakis EE, Hassan EA, Deligeoroglou EK, et al. Vulvovaginitis during childhood and adolescence. *J. Pediatr Adolesc Gynecol* 1997;10:39-43.
7. Altchek A. Vulvovaginitis in adolescents and younger girls. *Contemp Obs/Gyn* 1986;27:85.
8. Emans SJ, Goldstein DP. The gynecologic examination of the prepubertal child with vulvovaginitis. *Pediatric* 1980;65:758.
9. Pokorny SF. Prepubertal vulvovaginopathies. *From Obstetrics and Gyn Clinics of North America. Pediatric and adolescent Gyn Vol.19:1992.*
10. Pokorny SF, Stomer J. Atraumatic removal of secretions from the prepubertal vagina. *AM J Obstet Gynecol* 1987;156:581-2.
11. Aruda MM. Vulvovaginitis in prepubertal child. *Nurse Pract Forum* 1992;3:149-51.
12. Henderson P, Scott R. Foreign body vaginitis caused by toilet tissue. *Am J Dis Child* 1966;111:599.
13. Paradise JE, Campis JM, Friedman HM, et al. Vulvovaginitis in premenarchal girls. Clinical features and diagnostic evaluation. *Pediatric* 1982;70:193-8.
14. Pierce AM, Hart CA. Vulvovaginitis: Causes and management. *Arch Dis Child* 1992;67:509-12.
15. Jones R. Childhood vulvovaginitis and vaginal discharge in general practice. *Fam pract* 1996;13:369-72.