Bahrain *Medical Bulletin Vol.23, No.4, December 2001*

Vulvovaginitis Among Female Children

Nadham K Mahdi, MSc, Ph.D* Maysoon Sharief, CABOG**

Objectives: To investigate the possible role of microorganisms in vulvovaginitis among girls in the region.

Methods: Vulval swabs were obtained from 50 virgin girls with abnormal vaginal discharge. Their ages ranged from 8 months to 15 years. They were attending the obstetrics and gynecology clinics at Basrah during 1998 and 1999. The swabs were examined by wet preparation, Gram's stained smear and bacteriological culture methods.

Results: The most common pathogenic bacteria were S.aureus 10% , E.fecalis 10%, and E.coli 8%. Eggs of E.vermicularis and trophozoites of T.vaginalis were recovered at a rate of 4% and 6% respectively. However, Candida was diagnosed at a rate of 8%. Non- specific vulvo vaginitis was exceedingly common (28%). Candidiasis was more frequent with various concurrent lower genital tract infections.

Conclusion: Microorganisms including bacterial, mycotic and parasitic should be considered in the differential diagnosis of vulvovaginitis in order to give the proper treatment.

Bahrain Med Bull 2001;23(4):175-77.

The commonest gynecological disorder of childhood is vulvovaginitis. The vaginal opening in childhood is less protected by fat, the anus is anatomically very close to the introitus, and the children's tendency to play around on the floor or in the sand gives a greater chance of tiny particles of foreign matter and organisms being introduced to cause an infective reaction. Some workers have studied the vaginal flora in girls from infancy to 15 years[1,2]. Similarly, the lower genital tract microbiologic flora in the non-sexually active adolescent girls have been reported[3]. Nevertheless, little research has been directed toward defining the normal and pathogenic microbial flora of the lower genital tract in children[3]. This study is the first attempt to assess the possible role of microorganisms in vulvovaginitis among girls in this region.

---

* Department of Microbiology
** Department of Gynecology & Obstetrics
College of Medicine,
University of Basrah
Basrah
Iraq.

METHODS

The study was performed on girls attending the obstetrics and gynecology clinics during 1998 and 1999. A careful relevant history and full gynecological examination were undertaken. Vulval swabs were obtained from 50 virgin girls with variable degrees of abnormal vaginal discharge. Their ages ranged from 8 months to 15 years. The swabs were examined by wet preparation, Gram's stained smear and bacteriological culture methods.

The vulval swabs were inoculated on blood, chocolate and MacConkey's agar which were incubated at 37^0C for 24 hours. The first two agars were incubated anaerobically.

The chi-square (X^2) test was used as a test of significance. Differences were recorded as significant whenever the probability (p) was less than 0.05.

RESULTS

Microbiologic studies were completed in 50 non-sexually active virgin girls. Of those, 26(52%) were younger than 6 years, 11(22%) were 6 to 10 years and 13(26%) were 11 to 15 years of age (Table 1). The median age for the entire study group was 6.8(4.7 years. The highest incidence of abnormal vaginal discharge associated with detectable microorganisms was among girls of age group 0.5-5 years and 11-15 years (Table 1). This constitutes 72% of all examined girls. However, the relationship is statistically insignificant ($X^2 = 9.54$; $P>0.05$).

Table 1. **Vulvovaginitis among girls in relation to their ages**

Age (Years)	No. (examined)	No. (%) infected
0.5-5	26	24 (92.3)
6-10	11	10 (90.9)
11-15	13	12 (92.3)
Total	50	46 (92.0)

$X^2 = 9.54$; DF=2; $P>0.05$

Isolation rates of the microorganisms under investigation in the sample are shown in (Table 2). Out of the 50 girls examined, 46(92%) were found to be infected. The most common pathogenic bacteria were Staphylococcus aureus (10%), Enterococcus fecalis (10%) and Escherichia coli (8%). Eggs of Enterobius vermicularis and trophozoites of Trichomonas vaginalis were recovered at a rate of 4% and 6% respectively. Candida was diagnosed at a rate of 8%. The differences between the non-specific (mixed), bacterial, mycotic and parasitic causative agents are statistically significant ($X^2 = 16.17$; $P<0.05$).

Table 2. Prevalence of vulvovaginal microorganisms isolated from virgin girls

Microorganisms	Age (years) Mean ± SD	No. (%) infected n=50
Non-specific (Mixed)	7.8±5.4	14 (28)
Bacterial:		
N.gonorrhoeae	7.4±9.3	2 (4)
Gardneralla vaginalis	14.0±0.1	1 (2)
S.aureus	3.6±2.8	5(10)
E.fecalis	7.2±2.7	5 (10)
Lactobacilli	14.0±0.0	1 (2)
Haemophilus ducreyi	13.0±0.0	1 (2)
E.coli	1.9±1.4	4 (8)
Klebsiella	3.2±1.2	3 (6)
Proteus	14.0±0.0	1 (2)
Mycotic:		
Candida spp.	10.0±2.9	4 (8)
Parasitic:		
T.vaginalis	4.3±1.1	3 (6)
E.vermicularis	6.0±1.4	2 (4)

$X^2 = 16.17$; DF = 3; $P<0.05$

The non-specific vulvovaginitis was exceedingly common (28%) (Table 3). However, candidiasis was more frequent with various concurrent lower genital tract infections.

Table 3. **Patterns of microorganisms among the non-specific vulvovaginitis in the studied girls**

Mixed infection	Age (years) Mean±SD	No. (%) infected n = 50
Candida & E.fecalis	14.0±0.0	1 (2)
Candida & S.aureus	9.6±4.5	3 (6)
Candida & Lacobacilli	14.0±0.0	2 (4)
Candida & E.coli	7.0±4.2	2 (4)
Candida & Klebsiella	3.0±1.4	2 (4)
Candida & Bacteriods	2.0±0.0	1 (2)
Candida & N.gonorrhoeae	1.0±0.0	1 (2)
S.aureus & N.gonorrhoeae	14.0±0.0	1 (2)
E. vermicularis & E.coli	2.0±0.0	1 (2)
Total	7.8±5.4	14 (28)

DISCUSSION

The microorganisms involved in the vulvovaginitis of virgin girls includes bacterial, parasitic and mycotic agents. They should be considered in the differential diagnosis of the disease in presence of the vaginal discharge in order to give the proper treatment. These agents would constitute an important public health problem among the young girls in the region. Examination of apparently healthy girls was not possible because they refused to have vulval swabs done in the absence of any complaint of vaginal discharge.

The bacterial agents isolated from the vaginal cultures were similar to those reported in girls from infancy to 15 years elsewhere[1,2]. The prevalence of N.gonorrhoeae varies widely with the population studied. Screening clinics report an infection rate of 3% to 8% for adult women and 3% to 13% for adolescents[4-6].

Gonorrhoeae is rare in children[4] and is usually linked to sexual abuse. Although there was no history of sexual abuse, our findings include 2 cases of N.gonorrhoeae and another 2 cases in association with other organisms. In Basrah, 5 (4.2%) cases of pregnant and 11(12.8%) of non-pregnant married women were found to be infected with N.gonorrhoeae[7,8].

Vaginal colonization with E.coli and Klebsiella was detected in 14% of the examined girls. They were isolated primarily from girls under the age of 4.5 years. However, E.coli has been reported to occur in upto 27% of vaginal cultures and 20% of cervical cultures in adult women[9,10]. Vaginal colonization with fecal organisms in the studied girls may be related to the fact that many of them were wearing diapers or were following improper hygienic measures.

Candida species was the most common cause of vulovaginitis among the studied girls. It has been isolated from vaginal swabs in 0% to 22% of asymptomatic adults[11,12], 35% of adolescents aged 11 to 15 years[2] and 26% of apparently healthy children[1]. Another study also indicates that there were no differences between the sexually active and non-active adolescents[3]. In Basrah, Candida has been recovered at rate of 13.9% and 31.1% in non-pregnant and pregnant women respectively[7,8].

Trichomonas vaginalis was detected among 3(6%) girls. The source of infection could be their infected mothers or through toilet facilities and fomites[13,14]. Trophozoites of T.vaginalis were diagnosed at a rate of 20.9% and 12.6% among the sexually active non-pregnant women in Basrah[8,13]. In addition, an infection range of 10.9% to 15% was recovered among the pregnant women in Basrah[7,13]. In other part of the world, T.vaginalis has been reported to be present in 10% to 25% of adults, adolescents and children[1,6] while none has been recorded among non-sexually active girls[3].

During the study period, E.vermicularis was identified in 3(6%) girls. In fact, the intestinal infection rate was 9% in children between 1-7 years old in Basrah[15]. The disease appeared to be most prevalent among 5 years old (18.1%) children. A cool moist

atmosphere with little ventilation enables ova to survive on clothing or dust for several weeks, while a high temperature, dry atmosphere and good ventilation cause their destruction. The individual and group hygiene is another important factor in relation to the occurrence of the disease. The hygienic practices tend to be poor during summer and spring seasons when the underclothing is worn day after day and bathing is infrequent.

CONCLUSION

The results of this study reflect a better understanding about the role of bacterial, mycotic and parasitic causative agents in vulvovaginitis in young females. Better treatment can be provided by taking these results into account.

REFERENCES

1. Hammerschlag MR, Alpert, I, Rosner, P, et al. Microbiology of the vagina in children: Normal and potentially pathogenic organisms. Pediatr 1978;62:57-62.
2. Hammerschlag MR., Alpert S, Onderdonk AB, et al. Anaerobic microflora of the vagina in children. Am J Obstet Gynecol 1978;131:853-60.
3. Shafer MA, Sweet RL, Ohm-Smith MJ, et al. Microbiology of the lower genital tract in postmenarchal adolescent girls: Differences by sexual activity, contraception and presence of non-secific vaginitis. J Pediatr 1985;107:974-81.
4. Barrett-Conror E. Gonorrhoea in adolescent girls in a closed population. Am J Dis Child 1973;125:233-8.
5. Fraser G J, Retting PG, Kaplan DW. Prevalence of cervical Chlamydia trachomatis and Neiseria gonorrhoeae in female adolescents. Pediatr 1982;71:333-6.
6. Shafer MA, Blain B, Beck A, et al. Chlamydia trachomatis important relationships to race, contraception, lower genital tract infection, and Papanicolauon smears. J Pediatr 1984;104:141-6.
7. Mahdi NK, Al-Hamdani MM. Sexually transmitted diseases among woman with habitual abortion. Eastern Mediterranean Hlth J 1998;4:343-9.
8. Sharief M. Genital infections among women using various contraceptive methods in Basrah, Iraq. Eastern Mediterranean Hlth.J 1998;4:487-92.
9. Gorbach SL, Menda KB, Thadepalli H, et al. Anaerobic microflora of the cervix in healthy women. Am J Obset Gynecol 1973;117:1053-7.
10. Tashijian JH, Coulam CB, Washington JA. Vaginal flora in asymptomatic women. Mayo Clin Proc 1976;51:557-61.
11. Levison ME, Corman LC, Carrington ER, et al. Quantitative microflora of the vagina. Am J Obstet Gynaecol 1977;12:80-5.
12. Linder GEM, Plantema FHF, Hoogkamp-Korstanje JAA. Quantitative studies of the

vaginal flora of healthy women and obstetrics and gynecological patients. J Med Microbiol 1978;11:233-41.
13. Mahdi N K. Urogenital trichomoniasis in an Iraqi population. Eastern Mediterranean Hlth J 1996;2:501-5.
14. Sparks J M. Vaginitis. J Reprod Med 1991;36: 745-52.
15. Mahdi NK, Al-Kafaji AA. Prevalence and seasonal variation of enterobiasis in children of Iraq. South-east Asian J Trop Med Public Hlth 1990;21:135-8.