

# Clinical review

## Do we need to treat vulvovaginitis in prepubertal girls?

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BMJ 2005;330:186-8

Vulvovaginitis is generally considered to be the commonest gynaecological problem in prepubertal girls,<sup>1</sup> although the incidence is unknown. In practice, the terms vulvitis, vaginitis, and vulvovaginitis are often used interchangeably by doctors in diagnosing inflammatory conditions of the lower female genital tract.<sup>2</sup> Diagnosing infection is confounded by the overlap between normal flora and potential pathogens. The presence of an organism does not itself denote causation, and the clinical picture as well as microbiology should be considered before infection is assumed.<sup>1 3</sup> Despite vulvovaginitis being a common problem, the initial management is mostly empirical, and antibiotics are commonly prescribed.

In this review, we present available evidence on the management of vulvovaginitis focusing mainly on the microbiology.

### Search strategy and selection

We made electronic literature searches with Medline (January 1965 to June 2004) and the Cochrane database to identify articles related to the aetiology and management of vulvovaginitis using the key words "vulvovaginitis and (prepubertal or premenstrual girls)." We limited our search to English language articles about children. We reviewed the abstracts of retrieved articles and obtained the full texts of relevant articles. We also reviewed the references of these articles. We excluded studies including pubertal girls.

### Aetiology and pathogenesis

The hypo-oestrogenic hormonal milieu in a preadolescent girl is a major factor in making her vaginal mucosa susceptible to infection.<sup>4</sup> The mucosa is thin, lacks cornification, and has an alkaline pH and is therefore susceptible to invasion from pathogens. Other factors putting the girl at risk are the close proximity of the rectum, lack of labial fat pads or pubic hair, small labia minora, and children's tendency to poor local hygiene and to explore their bodies,<sup>2 4 5</sup> spread of respiratory bacteria from hand to perineum, and local irritants such as nylon underwear.<sup>6 7</sup>

### Microbiology

The vaginal microflora of prepubertal girls has not been well defined. Many organisms have been cultured, but most studies were flawed for lack of control subjects or because the study combined prepubertal and peripubertal girls.<sup>5 8</sup> Hill et al reported a predomi-

### Summary points

Vulvovaginitis is the commonest gynaecological problem in prepubertal girls

The hypo-oestrogenic hormonal milieu in a such girls increases the susceptibility of the vaginal mucosa to infection

Vaginal microflora have not been well studied in normal prepubertal girls, making it difficult to decide whether bacteria isolated from a patient's vaginal secretions are part of the normal microflora or are the cause of symptoms of vulvovaginitis

Current evidence suggests that in prepubertal girls with clinical features of vulvovaginitis, antibiotics should be used only if a pure or predominant growth of a pathogen is identified

Isolating an organism associated with sexual transmission should prompt a careful evaluation for sexual abuse

nance of various anaerobes in the vaginal microflora of normal prepubertal girls,<sup>9</sup> but the number of children studied was small. Hammerschlag et al studied the microbiology of the vagina in 100 healthy girls in the late 1970s.<sup>8</sup> They found diptheroids, anaerobes, and *Staphylococcus epidermidis* were the commonest organisms, but they included girls who were sexually active and gave no information about sexual abuse.

Gerstner et al in their case-control study of 67 prepubertal girls (36 cases and 31 controls) found that 77% of vaginal cultures from asymptomatic girls were positive for aerobic bacteria, 65% were positive for anaerobic bacteria, and 45% were positive for both.<sup>10</sup> The most prevalent species were *Staphylococcus epidermidis* (35%), enterococci (29%), *Streptococcus viridans* (13%), and lactobacillus (39%). A similar spectrum of organisms was isolated in higher percentages from the girls with vulvovaginitis. Swabs were taken through vaginoscopy in this study, which is not common practice currently.

Jaquiere et al reported that girls with vulvovaginitis and control groups had similar microbiological flora overall, with commonly isolated organisms being

mixed anaerobes, diphtheroids, coagulase negative staphylococci, and *Escherichia coli*.<sup>1</sup> Mixed anaerobes and *Streptococcus viridans* were significantly more common in the controls, whereas *Staphylococcus aureus* and group A streptococcus were more common among the cases. However, the numbers were small and failed to reach significance in the case group. No child in either group in this study<sup>1</sup> nor in that by Gerstner et al<sup>10</sup> had *Gardnerella vaginalis*, *Trichomonas hominis*, urogenital mycoplasma, or *Neisseria gonorrhoeae* isolated in culture, and polymerase chain reaction amplification performed for *Chlamydia trachomatis* was negative for all specimens.<sup>1</sup>

*Haemophilus influenzae* and group A  $\beta$  haemolytic streptococcus are thought to be pathogenic organisms in the vaginal region in children.<sup>11</sup> The incidence of group A  $\beta$  haemolytic streptococcus varies from 8% to 47%,<sup>12 13</sup> and various studies suggest that this infection arises from previous respiratory or skin sources.<sup>3 13-15</sup> Although studies have reported *H influenzae* to be the commonest single organism in children with vulvovaginitis,<sup>11 16</sup> a recent study did not show similar results.<sup>3</sup> The introduction of routine vaccination against *H influenzae* could explain this difference. Shigella is an uncommon cause of vulvovaginitis in prepubertal children, and, of those reported cases, the causative organism is *Shigella flexneri*.<sup>17</sup>

*Candida* is usually not isolated in prepubertal girls,<sup>1 3 18</sup> but it may be found in girls with predisposing factors, such as a recent course of antibiotics, diabetes, or the wearing of diapers.<sup>2</sup> Organisms associated with sexually transmitted diseases also can cause vulvovaginitis: finding *Neisseria gonorrhoeae* or *Chlamydia trachomatis* should prompt a careful evaluation for sexual abuse.<sup>2</sup>

### Clinical features of vulvovaginitis

#### Symptoms

- Vaginal discharge (62-92%)<sup>1 3</sup>
- Redness (82%)<sup>1</sup>
- Soreness (74%)<sup>1</sup>
- Itching (45-58%)<sup>1 3</sup>
- Dysuria (19%)<sup>3</sup>
- Bleeding (5-10%)<sup>1 3</sup>

#### Physical signs

- Inflammation (redness of the introitus in 87%)<sup>1</sup>
- Excoriation of the genital area<sup>2</sup>
- Vaginal discharge

### Other causes

Threadworms are a common cause of vulvovaginitis (fig)<sup>19</sup> and should be considered in children whose major symptom is nocturnal perineal pruritus.<sup>3</sup> The possibility of sexual abuse should always be considered when a child presents with genital symptoms,<sup>1</sup> particularly in the presence of rectal or genital bleeding, developmentally unusual sexual behaviour,<sup>20</sup> and recurrent or persistent symptoms. The presence of an organism normally associated with sexually transmitted infection is highly suggestive of sexual abuse.<sup>21</sup> Other uncommon causes include a foreign body in the vagina, lichen sclerosis, vaginal and cervical polyps, and tumours.<sup>4 5</sup>

### Non-specific aetiology

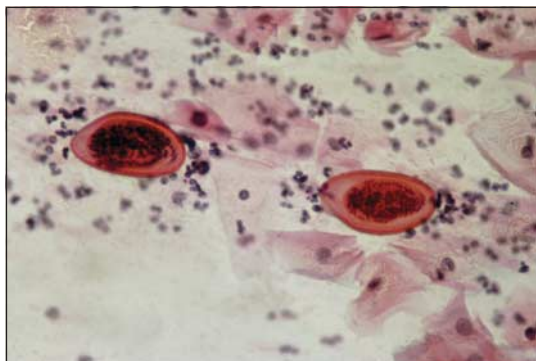
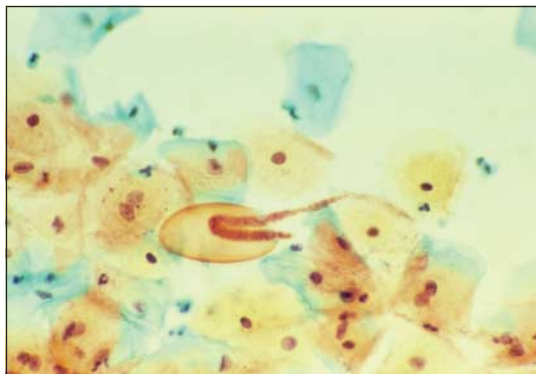
In 25-75% of girls with vulvovaginitis, a specific pathogen is not isolated.<sup>2 22</sup> This may be due to non-specific irritation resulting from the use of bubble bath, soaps, or shampoos; poor hygiene; tight clothing; or faecal contamination.

### Clinical features and management

The box shows the presenting symptoms and signs of vulvovaginitis. The most common and troublesome symptoms are vaginal discharge, pruritus, erythema,<sup>23</sup> and soreness.<sup>1</sup>

A detailed history and examination, including inspection of the genital area, are essential.<sup>11</sup> Swabs of vaginal secretions from the introitus should be obtained for gram staining, microscopy, and culture. The presence of leucocytes increased the likelihood of finding bacterial pathogens in one study.<sup>3</sup> In suspected cases of threadworm infection, a "sellotape test" may be undertaken,<sup>1 11</sup> even though it is said to have a relatively low yield.<sup>3</sup> Urine microscopy and culture may be helpful in children with dysuria.

The available evidence suggests that vaginal secretions should be obtained for microbiological investigations, and antibiotics should be used only if a pure or predominant growth of a pathogen is identified.<sup>1 3</sup> Adult studies suggest that both the identity of the pathogen and the bacterial load are important in the development of infection.<sup>24 25</sup> Isolation of organisms that have a strong association with sexual transmission requires further investigation in accordance with the national guideline on the management of suspected sexually transmitted infections in children and young people.<sup>21</sup>



Adults (top) and eggs (bottom) of the threadworm (*Enterobius vermicularis*) are a common cause of vulvovaginitis

**Additional educational resources**

- eMedicine ([www.emedicine.com/](http://www.emedicine.com/))—Search for “vulvovaginitis” on this US clinical knowledge database
- MedlinePlus (<http://medlineplus.gov/>)—A service of the US National Library of Medicine and the National Institutes of Health
- Royal Children’s Hospital, Melbourne. Kids health info for parents: Vulvovaginitis ([www.rch.org.au/kidsinfo/factsheets.cfm?doc\\_id=3726](http://www.rch.org.au/kidsinfo/factsheets.cfm?doc_id=3726))

In children with threadworm infection a course of mebendazole is useful. Antifungal creams usually have no place in the initial management of vulvovaginitis, since candida is an unlikely pathogen in prepubertal girls.<sup>1</sup> Girls with non-specific vulvovaginitis should be advised about hygienic measures—avoiding tight fitting clothing or other irritants such as harsh soaps to the vulva, front to back wiping after using the toilet, sitz baths, and protective ointments.<sup>2,3</sup> For persistent or recurrent vulvovaginitis, an opinion from a gynaecologist to rule out a foreign body is traditionally recommended.<sup>4</sup>

**Conclusions**

In the management of vulvovaginitis in prepubertal girls current evidence suggests that, in addition to giving advice about hygienic measures, vaginal secretions should be obtained for microbiological investigations and that antibiotics should be used only if a pure or predominant growth of a pathogen is identified. This recommendation is based on one case-control study<sup>1</sup> and one retrospective study.<sup>3</sup> However, there is little literature regarding the vaginal microflora of prepubertal children, and it is therefore difficult to determine whether bacteria isolated from patients’ vaginal secretions are part of the normal microflora or are the cause of symptoms of vulvovaginitis.

Of the existing studies on the microflora of the prepubertal vagina, many are flawed for lack of control subjects, and most combined prepubertal and peripubertal children, had small numbers, or lacked comprehensive cultures for a wide variety of micro-organisms. Clearly we need well designed, adequately powered, high quality studies to evaluate the vaginal microflora in asymptomatic prepubertal children and in those with symptoms of vulvovaginitis.

Contributors: AJ had the idea for the article, CSA performed the literature search and helped write the first draft. MJ helped write the first draft and is guarantor. All authors contributed to revisions. RG is guarantor.

Funding: None.

Competing interests: None declared.

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- (Accepted 15 November 2004)

**Corrections and clarifications**

*Can the human eye detect an offside position during a football match?*

Two errors occurred in this article by Francisco Belda Maruenda in our Christmas issue (*BMJ* 2004;329:1470-2, 18-25 Dec). In the section headed “Is the human eye able to detect an offside offence?” the final sentence of the first paragraph incorrectly states: “The time that the eye needs to detect all the objects is the sum of the eye movements and the accommodation that it has to do.” In fact, the time needed is the sum of the integration of the eye movement and accommodation.

The caption for the bottom half of figure 2 (p 1471) should have stated that this showed an incorrect call of offside (not a correct call)—the assistant referee is holding up a flag for an offside that does not exist.

*“I recognise myself in that situation...” Using photographs to encourage reflection in general practitioners*

The authors of this article in the Christmas issue, Torgeir Gilje Lid and colleagues, would like to correct their oversight by thanking Drs Aslak Bråttveit, Margareth Oshaug, and Heidi Tiller for allowing themselves to be photographed for this article (*BMJ* 2004;329:1488-90, 18-25 Dec).