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TO THE EDITOR, *British Journal of Venereal Diseases*

Survival of *Candida albicans* on fabric after laundering

Sir,

The prevalence of vulvovaginal candidiasis (thrush) has been rising over a decade in spite of an array of adequate drugs for its treatment. A total of 31 886 cases was reported in England in 1972 compared with 50 954 in 1981.¹ These are only the cases reported by departments of genitourinary medicine. Very many more women in deep distress are treated each year, some several times, in general practice, family planning clinics, and departments of gynaecology. At least 20% of these cases are known to be recurrences.²

Predisposing factors are many and varied, but are ill understood. Recurrences by autoinfection, such as from the bowel,³ from the sex partner,⁴ and fomites⁵ have been suggested. The fashion among young women to wear tight fitting jeans, nylon tights, and nylon underpants contributes to the establishment and maintenance of a humid minitropical climate for the vulva and introitus. It has been suggested that abandoning nylon tights and pants would be a reasonable means of prevention of recurrences in some patients; the benefits are limited.⁶

It is 236 years since Jean Astruc, then physician to the King of France, reported wrestling with this problem.⁷ Like us and others, he declared his belief in multiple causes for thrush. Among these, he mentioned contagion by contact with clothing containing "thrush corpuscles". As the question of fomites has received scant attention in recent years, we decided to investigate.

We wondered if *Candida albicans* could survive on underwear after normal

domestic laundering with modern detergents and designed a simulated laundering process in the laboratory to investigate this. NCPF 3153 (*C. albicans*) and clinical isolates of *C. albicans* were used to inoculate samples of cotton and nylon fabric. Pooled human serum was added to represent any protein present in vaginal discharge. The samples were dried at room temperature for several days before washing with detergent washing powder, rinsing, and drying. *C. albicans* was recovered from both types of fabric after this procedure if the washing temperature was 50°C (manufacturers recommended washing temperature for most items of underwear); but not if a higher temperature (70°C or greater) was used or if the cotton fabric was ironed with a hot iron.

As the latter two procedures were regarded as impractical in the home, we investigated an alternative method of eradicating *C. albicans*. This consisted of soaking the fabric overnight in a 1% solution of the antifungal disinfectant Tego 103G, and then washing in the usual way. *C. albicans* could not be recovered from laboratory infected fabrics after they had been soaked in Tego and washed at 50°C.

Tego shows excellent compatibility with skin, and we think it may form the basis of a safe, acceptable, and effective procedure for patients to use in the home.

A clinical trial is now under way to investigate the survival of *C. albicans* on infected patients' underwear and to assess the effect of soaking undergarments in Tego before laundering on the recurrence rate of vulvovaginal candidiasis.

Yours faithfully,
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Prepubertal children with condylomata acuminata

Sir,

The report by M C Baruch *et al* on perianal condylomata acuminata in a male child (*Br J Vener Dis* 1984; **60**:60-1) presents an uncommon but not unique infection. Having transgressed in the past by not carefully reviewing the "foreign" literature, I understand the oversight in this case. Perianal and penile condylomata have been described previously in boys. In a case report and literature review during 1981 we collected 34 cases of condylomata acuminata in prepubertal children including nine boys,¹ five of whom had perianal lesions and four had penile lesions.

Transmission of the human papilloma virus in children may occur in several ways: 1) during parturition in an infected mother, 2) from close non-sexual contact with infected caretakers, and 3) from one or more sexual encounters. As the incubation period after exposure to the virus ranges from one to 20 months (average 2 to 3 months), the mode of transmission in individual cases is often not clear. In 18 of the 34 cases reviewed, the source and mode of transmission were unknown. The evaluation of the child with condylomata acuminata requires a thorough medical and social evaluation to determine whether there is any evidence of sexual abuse or other sexually transmitted diseases, and to establish the source of the virus.

Yours faithfully,
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