

Vulvovaginitis in Nigerian Children*

A. O. OSOBA AND K. O. ALAUSA

Endemic Diseases Clinic, University College Hospital, Ibadan.

Osoba, A. O. and Alausa, K. O. (1974). *Nigerian Journal of Paediatrics*, 1 (1), 26. **Vulvovaginitis in Nigerian Children.** Seventeen Nigerian children aged 2 to 9 years presenting with vaginal discharge were investigated as well as their close contacts and relatives. Ninety-four per cent of the children were found to have gonococcal vulvovaginitis. Of 36 close contacts or relatives, 6.4 per cent were found to have gonococcal infection. The source of infection in five cases were traced to adults through intermediary objects, while in another two cases infection occurred through sexual assault. Attention of practitioners is called to the need for examination and treatment of mothers and those looking after the child, as a control measure.

VULVOVAGINITIS is not unknown in children. The most serious form of infection is gonococcal, which is regarded as being rare (Jeffcoate, 1967). Other organisms (candida albicans, staphylococci, streptococci, haemophilus, diphtheroids, trichomonads, E. coli and thread worms) have been reported as being commoner causes of vulvovaginitis. Other causes of non-gonococcal vulvovaginitis in children include malnutrition in the presence of poor hygiene, a history of recent infectious disease such as measles, and foreign bodies in the vagina, such as pins, matches, paper clips, beads, stones and earth worms (Heller, 1969; Jeffcoate, 1967).

Literature on vulvovaginitis in childhood is scanty, yet there is a vast number of publications on gonococcal infection in adults, probably due to the rising incidence of gonococcal infection in all countries (Guthe, 1970). In some parts of Africa, where there are no venereal disease clinics, gonorrhoea is considered to be endemic.

The rising and high incidence of gonococcal infection in adult Nigerians (Osoba, 1972) and the increasing frequency with which young children with vaginal discharges are seen at the Endemic Diseases Clinic, University College Hospital, have prompted us to study the clinical features, causes and mode of infection in a group of Nigerian children, referred because of vaginal discharges, in the hope that attention of practitioners in tropical countries will be attracted to this condition, and particularly to its prevention and control.

Materials and Method

Our materials consisted of 20 consecutive children under 12 years of age referred to the Clinic because of vaginal discharge or dysuria. All the patients were accompanied to the hospital by their parents or grandparents. Three children, aged 11, 12 and 15 years were excluded from the

*Paper presented to 4th Annual Conference of Paediatric Association of Nigeria, 13th January, 1973.

study because they had previously engaged in sexual intercourse and had no hymens.

A detailed history of onset of symptoms was taken from the mother together with enquiries into recent history of acute infectious diseases, passing of worms in stool, bathing in swimming pools. The mother was then questioned as to the possibilities of sexual assault by an adult or mutual masturbation with other children, the number of children under the age of 15 years in the household, and the type of bath the child had in the house (e.g. enamel bath, bucket, stream, etc.). A brief history of the family background was also taken and the social status of the family estimated.

Physical examination of the child was carried out, noting the state of nutrition and standard of cleanliness. The underwear of the child was closely examined for stains of blood or vaginal discharges. The vulva was examined for any evidence of sexual assault and presence of a discharge. The vulva was then cleaned with a sterile cotton wool swab and visualised with a nasal speculum for foreign bodies. Rectal examination was also performed with the little finger for foreign bodies in the vagina (Radiography was performed in doubtful cases). Two vaginal swabs were taken. One was plated on to Brain Heart Infusion Agar with colistin, vancomycin and nystatin for the isolation of gonococci. The other swab was used to make smears on clean glass slides, subsequently stained by Gram's method, and a search was made for gram-negative intracellular diplococci. A wet preparation in saline of the swab was made and examined for candida, trichomonads, worms and ova. The urine and stool of the children were then taken for microscopy and culture. Blood was also taken for the Venereal Diseases Research Laboratory (V.D.R.L.) Test.

The members of the family of each child were invited for examination and investigations. Gonococci, trichomonads and candida were sought for by the above techniques.

The gonococci isolated were identified by the positive oxidase test and fermentation reactions. The sensitivity of the isolated strains were determined by the Oxoid multodisk method against penicillin, streptomycin, tetracycline and chloramphenicol. All diagnostic procedures were carefully carried out to avoid trauma to the children.

Results

Table I summarizes the age distribution of the 17 children. The ages ranged between 2 and 9 years. Ten (58.8 per cent) of the 17 cases were between 2 and 5 years of age. The average age of the children was 4.8 years

TABLE I
Age Distribution of 17 Children with Vulvovaginitis

| Age (yr) | No. of Cases |
|----------|--------------|
| 2 | 2 |
| 3 | 3 |
| 4 | 3 |
| 5 | 2 |
| 6 | 3 |
| 7 | 2 |
| 8 | 1 |
| 9 | 1 |
| Total | 17 |

The mode of infection is shown in Table II. In two cases (13.3 per cent) out of the 17 cases, the history suggested sexual transmission of infection following sexual assault of the girls. In the first case the assault was committed by a boy aged 20 years, and in the second case by a boy of 8 years. It has to be assumed that these two boys were infected with the gonococci. From the history given by the mothers of these two girls it appears the incubation period of 2 to 3 weeks is longer than the usual 3 to 5 days in adult males. The housemaid looking after one of the children was

TABLE II

Mode of Infection in 17 Children with Vulvovaginitis

| <i>Mode of Infection</i> | <i>No. of Cases</i> | <i>Remarks and Findings</i> |
|---|---------------------|--|
| Previous sexual exposure or assault. | 2 | <i>1st case (a)</i> By a boy of about 20 years 2 weeks before symptoms. <i>2nd Case (b)</i> By a boy of 8 years 2 weeks before attendance in hospital |
| Using the same towel with parents or relatives. | 2 | <i>1st Case</i> <i>Shares towel with mother</i> <i>2nd Case</i> <i>Shares towel with the father. (The mother accused the father of indiscriminate sexual exposure). Father has purulent urethral discharge.</i> |
| Contact with housemaid | 1 | <i>The housemaid had positive smears for gonococci.</i> |
| Mutual masturbation | 0 | <i>No history of masturbation obtained</i> |
| Using the same pants with sister | 1 | <i>Sister has a vaginal discharge. No pathogens found</i> |
| Living with grandmother | 3 | <i>Two grandmothers did not present themselves for examination.</i> |
| Undetermined | 8 | <i>No history of sexual assault, bathing in enamel bath with adults, masturbation.</i> |

discovered to harbour gonococci. Two children gave a positive history of sharing towels with parents or relatives and in one case the infected child shared pants with the sister who was noted to have a vaginal discharge previously. In no case was there any history to suggest transmission of infection through the enamel bath, swimming pool, or mutual masturbation. In 9 cases the mode of infection could not be determined.

Clinical Features

In 16 cases the presenting symptom (Table III) was vaginal discharge noticed by the mother or grandmother. Pruritus vulvae was present in three cases while three others presented with dysuria and one case with frequency of micturition. There was vulval ulceration in two cases and a history

TABLE III

Symptoms in 17 Children with Vulvovaginitis

| <i>Symptom</i> | <i>No. of Cases</i> | <i>Duration before hospital attendance</i> |
|--------------------------|---------------------|--|
| Vaginal discharge | 16 | 2 to 12 days |
| Pruritus vulvae | 3 | 3 to 4 days |
| Dysuria | 3 | 2 to 3 weeks |
| Frequency of micturition | 1 | 4 days |
| Bleeding per vagina | 1 | 12 days |
| Vulval ulceration | 2 | 2 weeks |

of bleeding per vagina in another case. It is probable that these resulted from pruritus due to the vaginitis. It is noteworthy that all the children were afebrile, and none had lower abdominal tenderness. In no case was there any foreign body found in the vagina.

Bacteriological Findings

Of the seventeen children investigated, 16 were found to have *N. gonorrhoea* infection, identified on smears and cultures. One case had coliform infection while another case had proteus spp. infection. One child had both *N. gonorrhoea* infection and candidiasis; the child's mother also had candida vaginitis, but no evidence of gonococcal infection. There was no case of trichomonal infection or thread worm infestation. Gonococci were not seen or cultured in one girl with vaginal discharge. This girl, however, had a small ulcer on the vulva. Urine examination, V.D.R.L. Test, and a search for pathogens were negative.

TABLE IV

Organisms Isolated from 17 Children with Vulvovaginitis

| <i>Organism</i> | <i>Vaginal Swab</i> | <i>Urine</i> |
|----------------------|---------------------|--------------|
| <i>N. Gonorrhoea</i> | 16 | 0 |
| Coliforms | 0 | 1 |
| <i>Proteus spp.</i> | 0 | 1 |
| <i>Candida spp.</i> | 1 | 0 |

Family Investigation

Mothers or grandmothers accompanying the children to the hospital were requested to subject themselves to investigation. Others in the household with whom the child may have had contact were also investigated. It was difficult to get the fathers to attend the clinic, presumably due to difficulty of leaving their employment during working hours. Table V shows the results of the investigations on contacts of the children. In only three cases, one mother, one sister and a housemaid were gonococci isolated.

TABLE V
Results of Family Investigations

| | <i>No. Examined</i> | <i>No. positive for gonococci</i> |
|-----------------|---------------------|-----------------------------------|
| Grandmothers | 1 | 0 |
| Fathers | 2 | 0 |
| Mothers | 15 | 1 |
| Sisters | 6 | 1 |
| Brothers | 0 | 0 |
| Other relatives | 6 | 0 |
| Housemaid | 6 | 1 |
| Total | 36 | 3 |

Antibiotic Sensitivity

The sensitivity pattern of the 16 strains of gonococci isolated is shown in Table VI. In one case the vaginal smear showed typical intracellular gram negative diplococci but no growth was obtained on culture. 5 strains (31.2 per cent) were resistant to penicillin, while 6 strains (37.5 per cent) were resistant to streptomycin. No strains resistant to tetracycline and chloramphenicol were encountered.

Serology

All the children gave Negative V.D.R.L. Test.

TABLE VI

Sensitivity Pattern of 14 Strains of N. gonorrhoea Isolated from children with vulvovaginitis

| | <i>No. of Strains</i> | | <i>Per cent Resistant Strains</i> |
|-----------------|-----------------------|------------------|-----------------------------------|
| | <i>Sensitive</i> | <i>Resistant</i> | |
| Penicillin | 11 | 5 | 31.2 |
| Streptomycin | 10 | 6 | 37.5 |
| †Tetracycline | 16 | 0 | 0 |
| Chloramphenicol | 16 | 0 | 0 |

† Two strains were not sensitive in vivo.

Treatment and Management

In all cases where the vaginal smears showed intracellular gram negative diplococci, treatment was initiated with procaine penicillin 600,000 units daily for 3 days, pending sensitivity report. The mother or relative attending with the child was instructed on how to carry out perineal toilet with saline thrice daily. It was observed, however, that in three cases where the sensitivity report showed the strain of the gonococcus to be sensitive to penicillin, there was no clinical response to the antibiotic. These children were subsequently treated successfully with tetracycline hydrochloride, 125 mg. q.d.s. orally. Similarly in two cases in which the in vitro sensitivity to tetracycline was recorded, clinical response was not obtained. There was, however, satisfactory response to spectinomycin dihydrochloride 1 gm. daily for 2 days. All mothers and grandmothers looking after the children were treated with 1.2 million units of procaine penicillin daily for three days.

Discussion

Vulvovaginitis due to gonococci occurs only in preadolescent girls although presumably it could occur in older women with atrophy of the vaginal mucosa (Da Costa, 1969). Before puberty the vagina and vulva are covered by columnar epithelium and are converted at puberty to stratified squamous epithelium by oestrogen. With the exception of conjunctivae, structures that have an

affinity for the gonococcus are generally lined by columnar, cubical or immature epithelium rather than by stratified squamous cells (Willcox, 1964). Hence, in young female children with relatively larger and more external areas of susceptible vulvar and vaginal epithelium, gonococcal infection is more easily acquired either directly from infected adults or indirectly through contaminated materials such as towels, beddings, toilet seats and underwear.

Among the seventeen children studied, the gonococcus was recovered in the vaginal exudate in 94.1 per cent of the cases. In the remaining one case, no pathogens were isolated in the urine and stool, and the V.D.R.L. Test was negative. This child, however, also presented with a vulvar ulcer. The exudate from this nonspecific ulcer was negative on 3 occasions for *T. pallidum* by the dark ground microscopy. It is probable that this ulcer was the cause of the vaginal discharge in this case. All the children presented with vaginal discharge but ten cases also had other symptoms such as pruritus, dysuria, frequency of micturition and bleeding per vagina. The duration of symptoms before medical attention was sought varied from 2 to 12 days.

The diagnosis of gonococcal vulvovaginitis in 16 children out of 17 cases is rather alarming; however, the finding has confirmed the impression of Lawson and Stewart (1967) who have stated that 4 out of 5 cases of vulvovaginitis in the tropics are due to the gonococcus. However, Long (1955), Gray and Kotcher (1961), stressed the decreasing importance of this agent in recent years in prepubescent children. Heller (1969), in a study of 50 children with vaginal discharge found only one suspected case of gonococcal infection with a positive smear but negative cultures. The high incidence of gonococcal vulvovaginitis in the tropical and under-developed countries is due to a variety of factors. Firstly, there is lack of adequate facilities for proper diagnosis, treatment and epidemiological surveillance of gonorrhoea and, indeed, of the other venereal diseases. The busy and overcrowded government hospitals are

engaged in treating other endemic conditions so that the treatment of venereal diseases is often carried out by pharmacists, native doctors or even quacks. Secondly, as a result of poor hygiene, low standard of living and overcrowding in bedrooms, genital contamination from infected adults (improperly treated or unaware of being infected) occurs more frequently. Thirdly, since about 5 per cent of women in Ibadan harbour the gonococcus unknown to them (Osoba, 1972), this large reservoir of the gonococcus in the female population is a ready source of infection to the children who come in close contact with them.

Several modes of infection have been suggested for gonococcal vulvovaginitis in the premenarcheal child but these have not been satisfactorily explained. These include intimate contact with infected parents or relatives, contaminated linens and towels, closet seats, sexual assault and mutual masturbation (Willcox, 1964). In this small series, we were able to identify the source of infection possibly through intermediary objects in 5 cases. In the first case the child shared the same towel with her mother, who was found to have positive smears for gonococci, while the father had a positive two-glass urine test with threads in the first glass, and he admitted to extra-marital sexual intercourse.

In the second case the child shared the same underwear with a sister who also on investigations was found to have gonococcal infection. It was therefore, presumed that in these two cases the children were infected by the mother and sister respectively by means of genital secretions from clothing and bedding. In the third case the child shared the same towel with her father who was in the habit of indiscriminate extra-marital sexual exposure and had been noticed by the wife to have a purulent urethral discharge a week before the child was brought to hospital. This father however refused to subject himself to examination. It is probable that this father had a gonococcal infection and hence was unwilling to subject himself to examination for fear of being exposed to the rest of the family. In the fourth case, the

Trichomonas vaginalis has been reported as a cause of vulvovaginitis in children. Feo (1956) found trichomonads in 3.6 per cent of Negro girls aged 1 to 9 years. In the present study, none of our girls, all negro, harboured this parasite, and neither did we find any foreign bodies in the vagina.

With the high and rising incidence of gonococcal infection in adults it is probable that many more children will become infected through intermediary objects or genital contact, unless effective epidemiological control of venereal diseases is carried out, particularly in tropical countries where no such programmes exist. Practitioners could help to reduce the incidence by their awareness of the condition, examination and treatment of relatives and close contacts of the children, as an immediate epidemiological measure.

REFERENCES

- Cohn, A., Stear, A. and Adler, E. L. (1940). Gonococcal vaginitis. *Ven. Dis. Inform.*, **21**, 208-220.
- Da Costa, E. J. (1969). Gonococcal vulvovaginitis. *Clin. Obst. & Gynae.*, **12**, 211-212.
- Feo, L. G. (1956). Incidence of *trichomonas vaginalis* in various age groups, *Am. J. Trop. Med.*, **5**, 786-790.
- Fine, J. (1966). Vulvovaginitis in children, *E. Afr. Med. J.*, **43**, 332-5.
- Gray, L. A., and Kotcher, E. (1961) Vaginitis in childhood", *Am. J. Obst. & Gynae.*, **82**, 530-539.
- Guihe, T. (1970) Present status of gonorrhoea control. *Postgrad. Med. Journal Supplement*, **(1)**, **48**, 7-11.
- Heller, R. H. (1969) Vulvovaginitis in a premenarcheal child. *J. Paed.*, **74**, 370-377.
- Jeffcoate, T. N. A. (1967). Principles of Gynaecology. 3rd ed. London, Butterworths. p. 394.
- Kinnear, T. W. G. (1963). The pattern of diabetes mellitus in a Nigerian teaching hospital. *E. Afr. Med. J.*, **40**, 288-294.
- Kozinn, P. J., Taschdjian, C. L., and Wiener, H. (1958). Incidence and pathogenesis of neonatal candidiasis. *Pediatrics*, **21**, 421-329.
- Lawson, J. B. and Stewart, D. B. (1967). Obstetrics and Gynaecology in the Tropics 1st ed. Edward Arnold Ltd., London, p. 411.
- Lang, W. R. (1955). Pediatric vaginitis. *New Eng. J. Med.* **253**, 1153-1160.
- Osoba, A. O. (1972) Epidemiology of urethritis in Ibadan. *Brit. J. Vener. Dis.*, **48**, 116-120.
- Thayer, J. D. and Moore, M. B. (1964). Gonorrhoea: Present knowledge, research and control efforts. Medical Clinics of North America, May 1964, 755-765
- Weaver, J. D. (1950). Non-gonorrhoea vulvovaginitis due to Gram-negative intracellular diplococci. *Am. J. Obst. & Gynae.*, **60**, 257-260.
- Willcox, R. R. (1964) Textbook of Venereal Diseases and Treponematoses (1964). 2nd ed. William Heinemann Medical Books Ltd., London, p. 30