GONOCOCCUS INFECTION IN FEMALE CHILDREN

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GONOCOCCUS infection of the genital organs in infants and young girls is a condition which concerns the general practitioner and the gynecologist, as well as the pediatrician, to whom it presents an ever present menace. The innocence of the acquired infection, the difficulties encountered in diagnosis, the necessity for prolonged treatment, the practical impossibility of pronouncing a patient cured, and the frequency of recurrences are phases of the disease which justify any contribution concerned with pathology, diagnosis, or treatment. We have studied 42 cases of definite gonococcal vulvovaginitis, which have come under the care of the department during the past two years. In each patient the gonococci were demonstrated in the secretions either at the time of admission or subsequqently.

AGE INCIDENCE

The average age of the patients was six and one-half years, the oldest child being twelve years and the youngest nine months.

SOURCE OF INFECTION

In the majority of these cases we have been unable to determine the probable etiology with any definiteness, although in 13 patients where the history was quite clear cut, it was indicated that contamination from other infected members of the family played the greatest rôle, since in four cases the father, in two the mother, and in one an older sister were known to have had the disease. Two other patients apparently contracted the disease from playmates who were known to have had a vaginal discharge; in three of the older children rape was indicated, and one child became infected during an epidemic in a Children's Home. It is worthy of note that when one child becomes infected, the other female children in the family usually contract the disease, unless effective isolation is practiced. We have noted three such families where all the female children were under treatment. It might possibly be assumed that in the older children attempted intercourse was a factor, although direct evidence is lacking. In no instance was the disease contracted by direct contact with an infected mother at the time of birth. It may be that children born of gonorrheal mothers have an immunity which protects them for some time and explains why even in a large venereal obstetric clinic infection at the time of birth is rarely noted.

DIAGNOSIS

We still feel that the most reliable method of diagnosis is the close correlation of the physical findings with a careful examination of smears stained with the Gram method. Burke's[1] modification of the original Gram stain is most satisfactory. Positive findings are usually easily made when the disease is recent but become more difficult as the infection becomes chronic. Our experience with diagnostic cultures agrees very closely with that of Stein,[2, 3] that they cannot be relied upon. We have never obtained a positive culture where the smear examination was negative, but in approximately one-half the cases with positive smears, we have been unable to grow the organism. We have had no personal experience with the complement fixation or with the skin test.

METHOD OF EXAMINATION

As early as 1893, Koplick[4] expressed the opinion that the vagina was the seat of the infection but that involvement of the cervix was frequently present and explained the intractable nature of the disease. Scommazoni[5] and Hess[6, 7], who have had opportunities to study under the microscope the cervices of children who had died from intercurrent diseases have reported evidences of cervical inflammation. In 1924, Randall,[8] from this clinic, reported 11 children with vulvovaginitis which was resistant to the ordinary methods of treatment, and in 5 of whom examination with the vaginoscope revealed the presence of cervical disease.

With these facts in mind, our routine demands examination of the cervix through an electrically lighted, Koch, eight-centimeter urethroscope of appropriate size (22 to 26, French). A short instrument is preferable, since the manipulations incident to obtaining smears and giving treatments are more easily carried out than when longer instruments are used. As a rule, the instrument can be passed through the hymenal orifice without difficulty, but occasionally incision of the hymen may be necessary. With the child on the edge of the table and with the hips elevated, the urethroscope is passed into the vagina and a careful inspection made. Usually the cervix as well as the vaginal walls are reddened, while occasionally small punctate hemorrhagic areas are visible, and frequently a drop of pus protrudes from the external os. After the cervix has been cleansed with a small piece of cotton on the end of a nasal applicator, a fine platinum loop is passed into the cervical canal and material obtained for smear examination. The smear is prepared by tapping the loop gently into a small drop of distilled water on the slide. Other smears are taken from the vagina, vulva, and urethra as indicated, and more recently also from the rectum.

FINDINGS

Of the 42 cases thus examined at the time of admission, 40, or 95 per cent, showed gonococci in the cervical smears before we had instituted any treatment. Approximately one-half of the cases had had

treatments elsewhere, leaving 20 children with gonococci in the cervix before any treatment had been given. In the patients who had been treated, there is the possibility that vaginal irrigations had washed the organisms into the cervical canal, but in 20 of the cases this cannot be argued, since there had been no treatment.

It seems logical that the cervical involvement would occur chiefly in the chronic form of the disease, but our experience would indicate that it is also present in the early stages of the infection. Two of our patients had contracted the infection only two weeks before admission, and had been brought to the hospital very shortly after the appearance of the discharge, while another case was of not more than three weeks' duration. In none of these children had there been any previous manipulations or irrigations, but the smears from the cervix showed gonococci.

The organisms were obtained in smears from the urethra in only 9 of the cases, or 21 per cent, the ages of the children varying from six to eleven years.

Although Fraser[9, 10] reports having found the organisms in the rectums in 59 of 63 cases, we have been unable to demonstrate them in any of a considerable number of our more recent admissions. Tod[11] apparently has had a similar experience.

COMPLICATIONS

None of the more usual complications of gonorrhea as seen in the adult female, salpingitis, peritonitis, arthritis, or ophthalmia were observed in this series, although there are many such cases recorded in literature. We consider the cervicitis an almost constant finding, and as such do not consider it a complication.

TREATMENT

It is generally recognized that hygienic measures, including a daily bath and frequent cleansing of the vulva, are important in the treatment of gonorrhea in the female child, but there is as yet no uniformity of opinion as to the germicide which is most efficacious. Our routine treatment includes twice-daily, hot, vaginal douches with saline solution. Immediately after the morning douche, the cervix is exposed through a urethroscope and a gonococcide applied to the cervical canal by means of a nasal applicator. The portio and the vaginal vaults are painted thoroughly, and the lower vaginal walls are treated as the instrument is withdrawn slowly. The same antiseptic is applied to the vestibule and vulva, and a few drops are instilled into the urethra.

In a clinical test to establish for ourselves the relative efficacy of various methods of treatment, we compared the time required for smears to become negative and to remain negative for three consecutive weeks under treatment and for an additional week without treat-

ment. Smears were taken weekly, all treatment being omitted on the day preceding this examination. As shown in Table I, 5 per cent mercurochrome was the most effective of the remedies we tried.

TABLE I. RESULTS WITH VARIOUS ANTISEPTICS

DRUG	AVERAGE NUMBER OF WEEKS FOR SMEARS TO BECOME NEGATIVE
Mercurochrome, 5 per cent	2½
Mercurochrome, 2 per cent	4
Mercurochrome ointment, 2 per cent	5½
Argyrol, 40 per cent	7½

After prolonged treatment with one antiseptic with no apparent effect, a change to another drug will frequently clear up the discharge in a relatively short time and render the secretions gonococcus-free.

A weak, saline douche seems more satisfactory than either potassium permanganate, lactic acid, or plain water. Our experience suggests that in addition to reducing the local inflammation and the discharge, such a douche is of some value in shortening the course of the disease.

At one time, thinking that perhaps gonorrhea was after all a strictly self-limiting disease, we observed several cases for some weeks without any treatment other than ordinary cleanliness. There was, under such conditions, no apparent improvement in the local condition and the discharge continued to show gonococci.

No consistent relation was found between the duration of the disease and its response to treatment, although in general the more recent infections required a longer time for complete disappearance of the organisms from the secretions.

We have not as yet given vaccines a satisfactory trial, but the reports in the literature are very contradictory, Hamilton,[12] Condat,[13] and Blanco and Villazon[14] reporting good results, while Barnett[15] could detect no definite improvement when vaccines were relied upon. We have tried "Gonalin," a commercial preparation of killed gonococci, with no noteworthy results.

STANDARDS OF CURE

It is practically impossible to state whether a patient is cured, since recurrences are so common. We have arbitrarily adopted, as a working standard, three consecutive weekly smears during which time treatment is continued, followed by a week of observation without treatment. If at the end of this period, the smears are still negative, the patient is discharged as "noninfectious" but the parents are instructed to have gynecologic and smear examinations made at the end of six weeks, six months, and one year.

RECURRENCES

Valentine[16] suggests that relapse occurs in almost all cases, while Fraser[9] states that only three of his cases relapsed, although three

others did not benefit from the treatment, and Norris and Mickelberg[17] give the frequency of recurrences as 12 per cent. The incidence of relapse will undoubtedly vary with the standard of cure. In our 42 cases with observations varying from three months to two years, there were 7 patients who had relapses (16 per cent). Of these 7, one had three and another two recurrences, making our total incidence of relapse 23 per cent. In certain instances, so-called relapses are really reinfections, but in the majority this factor can be well eliminated and a diagnosis of true recurrence must be made.

PERIOD OF HOSPITALIZATION

In this series, and with the various methods of treatment used, the average time necessary for smears to become negative was four weeks (longest, seventeen weeks; and shortest, one week), and the average number of days in the hospital after the smears were negative and before the patient was discharged according to our standards of probable cure, was thirty-four days. This made the average period of hospitalization about nine weeks.

SIMILARITY TO GONORRHEA IN ADULT FEMALES

Pearce,[18] by immunologic tests, attempted to divide the gonococcus group of organisms into infantile and adult types, assuming the former to be the causative organisms in vulvovaginitis. Clinically, such a differentiation has never been supported since many of the cases are acquired from adult members of the family, and to assume that the organism causing the vulvovaginitis is different from the organism causing gonorrhea in the adult, from whom it was acquired, seems unreasonable. Torrey and Buckell[19] have concluded from more recent serologic studies that "cross absorption experiments indicate that no definite serologic distinction may be drawn between strains isolated from vulvovaginitis cases and those from gonococcus infections in adults."

Our experience indicates that the only real differences between the disease in infants and in adults are the mode of acquiring the infection and the frequency of urethritis and salpingitis. We know of no definite reason for the relative infrequency of urethritis, although it is interesting that none of our very young children had organisms in the urethra, the youngest being six years of age. The small, undeveloped labia, the absence of pubic hair, and the young type of epithelium are the usual explanations for the ease with which the disease may be acquired by children; while the relative infrequency of salpingitis can surely be explained by the absence of menstruation, since the upward spread of the infection in adults most frequently occurs in association with that function.

The results of treatment are hardly more satisfactory in the adult female than in the child, even though here we may resort to the use

of the electric cautery and diathermy, methods which are not recommended in children. The problem of recurrence is similar, although in the adult it becomes increasingly difficult to rule out reinfection.

We are, therefore, forced to conclude that there is a marked similarity between the disease in the infant and in the adult, and suggest that the disease is better described by the term gonococcus infection in female children rather than gonococcus vulvovaginitis, which does not describe the full extent of the pathologic involvement.

SUMMARY

Contamination from some member of the family was, in this series, the most frequent source of gonococcus infection in female children, although in the majority of cases no etiologic history could be obtained.

The most reliable method of diagnosis consists in a correlation between the clinical findings and the results of a Gram stain of the secretions.

Smears from the cervical canal were positive for the gonococcus in 40 of 42 cases.

There was no definite relation between the duration of the infection and the cervical involvement. Even in recent cases gonococci were found in the cervix.

Gonococci were obtained from the urethra in nine cases, or 21 per cent, but never in children under six years of age.

Mercurochrome (5 per cent) caused the organisms to disappear from the secretions more quickly than either 2 per cent mercurochrome solution, 2 per cent mercurochrome ointment, or 40 per cent argyrol.

Four weeks was the average time necessary to procure negative smears.

Relapse occurred in approximately 23 per cent of the cases.

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