Clinical, cultural, and demographic aspects of gonorrhoea in a rural community in Uganda

O. P. ARYA,1 H. NSANZUMUHIRE,2 & S. R. TABER 3

It has been known for several years that there are considerable differences between the population growth rates of certain areas of Uganda. The reasons for these differences may have important implications, especially for socioeconomic and health planning. Two rural areas with a low and a high rate of population growth respectively were selected for an intensive demographic research project aimed at investigating sociocultural and medical factors related to differential growth rates. Gonorrhoea was found to be one of the most important factors responsible for these differences. The survey further disclosed some complex sociocultural characteristics favourable to the spread of gonococcus, which in the absence of adequate and appropriate diagnostic and treatment facilities has firmly established itself in the communities concerned.

Gonorrhoea in both uncomplicated and complicated forms has long been known to be very common in Uganda, according to the earliest available medical observations recorded by Cook (7, 12). More accurate data based on laboratory diagnosis have recently become available, but these come almost entirely from a few urban centres (2, 10, 11). While some aspects of this disease in rural Uganda have been described by Griffith (8) and Bennett (5), their figures are largely based on diagnoses made by medical auxiliaries in up-country hospitals and rural dispensaries, where proper laboratory diagnostic facilities are rare and the diagnosis in many cases must necessarily be grounded on clinical impressions. Such figures have also formed the basis of the annual returns to the Ministry of Health. Moreover, Griffith's study included figures for men only.

The purpose of this paper is to provide a more precise and detailed description of gonorrhoea among men and women of a remote rural area of

¹ Formerly Senior Lecturer, Department of Preventive Medicine, Makerere University Medical School, Kampala, Uganda. Now Consultant Venereologist to the United Liverpool Hospitals and Liverpool Regional Hospital Board, England.

^a Formerly Lecturer, Department of Medical Microbiology, Makerere University Medical School, Kampala, Uganda. Now Lecturer, Department of Microbiology and Immunology, Faculty of Medicine, University of Dar es Salaam, Tanzania.

³ Formerly Lecturer in Demography and Sociology, Department of Sociology, Makerere University, Kampala, Uganda. Now Director, Demographic Estimation Unit, City Planning Commission, Philadelphia, Pa., USA.

Uganda. This area is by no means typical of the whole of rural Uganda, the various parts of which differ considerably in their physical, demographic, cultural, and biological features. However, it can be taken to be representative of a sizable segment of the country's population.

This study was part of an intensive Demographic Research Project aimed at investigating the cultural, social, medical, and economic factors related to differential rates of population growth, and at testing methods of collecting accurate data on vital events.

MATERIAL AND METHODS

The methods used in the Demographic Research Project will be described in detail elsewhere. Briefly, two districts were selected as having low and high fertility respectively, based on data from the 1948, 1959, and 1969 Uganda censuses (14). These were Teso District in the Eastern Region of Uganda, with low fertility, and Ankole District in the Western Region, with high fertility. During the 1969 census a built-in random sample of 10% of rural parishes had been used for the collection of information on fertility and mortality. The list of parishes included in this 10% sample formed the sampling frame for the Project, from which 5 parishes from Teso and 4 from Ankole were randomly selected after stratification by average household size. However, time constraints limited medical examination to 3 parishes in Teso and 2 in Ankole.

588 O. P. ARYA ET AL.

The medical aspects of the Demographic Research Project were concerned with investigating malaria, malnutrition, and venereal disease, especially gonorrhoea, and their role if any in the rate of population growth in these two Districts. Medical examinations in Teso were carried out in July and August 1971, and in Ankole from December 1971 to January 1972. In this communication, it is proposed to deal with gonorrhoea only, including its prevalence and some outstanding clinical and epidemiological features.

As our procedures involved examination of the genitalia and the taking of specimens, including blood samples, numerous difficulties and objections due to various factors, especially cultural taboos and suspicions, soon became obvious. To overcome these, a great deal of explanation, tact, and patience were needed. As the survey was conducted in remote rural homesteads of low accessibility, considerable improvisation was necessary in order to provide proper privacy, suitable lighting and sterilization procedures, examination couches, etc. Medical students, mostly from the same language group as the respondents, were employed to take histories and for other technical work. A female nurse or medical student assisted in the examinations of women.

A quick clinical examination of all systems was made in both men and women. In men, the epididymes were palpated for any tenderness, thickening, etc. A sample of any urethral discharge present was spread on glass slides and the smears were fixed immediately. Some material was also plated on chocolate agar, as well as being collected on a charcoal swab and kept in Stuart's medium during transportation to the laboratory for culturing. Culture plates were kept in a CO₂ atmosphere in candle-extinction jars while in the field, in an air temperature of 26.5–30°C.

In women, Cusco's speculum was passed, the vagina was inspected, and the cervix cleaned and inspected. Smears and cultures for gonococci were taken from the cervical canal only. Bimanual palpation of the uterus and fallopian tubes was then performed. In cases of *virgo intacta* smears and cultures were made from the vagina only.

After 24 h of incubation at 36°C at the nearest district hospital (50–100 km from all parishes), the culture plates were transported by a night bus to Makerere University Medical School in Kampala, where all the laboratory tests were performed. Kampala was 370 km and 270 km from the Teso and Ankole District Headquarters respectively. (Minimum temperatures during the night journey ranged

between 15°C and 18°C.) The culture plates were then incubated for a further period of 24 h. Charcoal swabs in Stuart's transport medium reached Kampala within 24–48 h of sampling; material from these was then plated on chocolate agar and incubated for 48 h. The oxidase test was performed, followed by subculturing and sugar fermentation reactions. Urethral, cervical, and vaginal smears were stained with Gram's stain. Gonorrhoea was diagnosed if typical Gram-negative intracellular diplococci were seen or if gonococci were grown.

Blood samples were taken for serological tests for syphilis, carried out later at St Thomas's Hospital, London. Some gonococcal strains were also flown to the same hospital for determinations of the minimum inhibitory concentrations.

All information, including history, clinical findings, and laboratory results, was recorded on precoded record forms, subsequently transferred to punch cards, and analysed with the help of a sorter.

RESULTS

The results from Ankole District will be touched on only briefly, as they are not of direct relevance to this paper. Of the 166 men examined in Ankole, only 7 (4.2%) were found to have gonorrhoea. Many elderly women in this district refused pelvic examination, mainly owing to certain cultural taboos. This reinforced our earlier decision not to perform a pelvic examination on any postmenopausal woman. Of the 168 women who were adequately examined only 4 were found to have gonorrhoea, which was detected only on culture examination, the smears in all 4 cases being negative.

The remainder of this paper will be devoted to *Teso District*, which proved to have several interesting features.

A total of 270 men and 343 women came to the clinic in Teso—over 90% of those present in the defined sub-sample areas at the time of the examinations.

Men

Table 1 shows the degree to which the age distribution of the sample population corresponded to that of the whole District. The ratios in the fourth column indicate that younger males were underrepresented and older ones overrepresented. This is not surprising, as the sample population came from wholly rural areas whereas the District also includes towns and trading centres. Thus, the age distribution of the

| | | Men | | Women | | | | | |
|--------------|---------------|--------------------------|------------------------------|---------------|--------------------------|------------------------------|--|--|--|
| Age group | Sample (%) | Total District (%) | Sample/ District ratio | Sample (%) | Total District (%) | Sample/ District ratio | | | |
| 15–19 | 10.0 | 12.1 | 0.83 | 11.2 | 11.0 | 1.02 | | | |
| 20–29 | 18.1 | 20.8 | 0.87 | 22.7 | 24.5 | 0.93 | | | |
| 30–39 | 16.3 | 20.9 | 0.78 | 23.3 | 22.3 | 1.04 | | | |
| 40–49 | 24.4 | 17.3 | 1.41 | 17.1 | 17.7 | 0.97 | | | |
| 50–59 | 16.3 | 14.0 | 1.16 | 13.5 | 13.1 | 1.03 | | | |
| 60+ | 14.8 | 15.0 | 0.99 | 12.1 | 11.4 | 1.06 | | | |
| Total (n) | 270 | 161 147 | | 339 a | 180 572 | | | | |

Table 1. Age distribution of Teso sample and total District population

sample population reflected the migratory trends typical of young males.

Of the male sample 60.9% had had no formal education; only 5.4% had attended secondary school and less than half of those remaining had completed primary education.

75.8% of the sample were currently married (living with spouse), 14.2% were single (never married), and the remaining 10% were either widowed, divorced, or separated. Of the currently married, 25.7% had more than one wife at the time of survey.

Gonorrhoea. Of the 270 men who came to the clinic, 1 refused genital examination and a urethral discharge was found in 32, of whom 24 (8.9%) were discovered to have gonococcal urethritis. Here it is necessary to emphasize a major limitation of the methods used for the detection of gonorrhoea. Of the 16 men with bilaterally thickened epididymes, none was found to have active gonococcal urethritis. It is almost certain that in most if not all of these cases, bilateral epididymal thickening was due to prior gonococcal infection. Of further interest was the fact that this group included the highest proportion of childless men. This finding led us to exclude these 16 cases from the further analyses of factors related to gonorrhoea, as their inclusion would have heavily biased the results.

Education. No relationship was found between education and gonorrhoea. Of those with no schooling 9.5% had gonococcal urethritis, as compared with 9.0% of those with some schooling.

Age and marital status. The complex relationships between age, marital status, and gonorrhoea are indicated by the data in Table 2. The totals for different ages show an inverted U-shaped distribution of gonorrhoea rates—that is, the rate was zero among the 15-19-year-olds and rose with increasing age to a peak of 24.3%, after which it dropped for those aged 60 and older. Thus, in this sample gonorrhoea was predominantly an older man's disease. In only 3 of the 24 cases were the men under age 30.

The distribution by marital status was also slightly surprising in that the rate of gonorrhoea was much lower among the single men (2.6%) than among any other group. Furthermore, those who had been married but were no longer living with their spouse showed a rate (8.0%) 3 times as high as for single men and almost identical to that for men who were currently living with one spouse (8.5%). Finally, those currently married and living with more than one spouse (i.e., the polygamous men) had the highest rate of all: 19.1%.

Clinical features. Urethral discharge was demonstrated in 32 of the 269 men examined (Table 3), of whom 24 were discovered to have gonorrhoea. Of these 24, 8 had reported themselves as symptomless. Of the 10 men with gonorrhoea and reporting urethral discharge, 5 had had the discharge for over 3 weeks, and 6 had received some treatment. Of the latter only 4 had done so before resuming sexual contact with their wives. None of their part-

a Age for remaining 4 women not recorded.

590 O. P. ARYA ET AL.

Table 2. Number and percentage of Teso men with gonorrhoea, by age and marital status

| | | Single | | | one wif | Currently e | | l than on | e wife | | rated, div r widow | | | All me | n |
|---------------------------|---------------|--------|-------|-----------------------|---------|----------------|-----------------|--------------|--------|-----------------|-----------------------|-------|-----------------|--------|-------|
| Age With gonorrhoes No. % | gonorrhoea To | | Total | With Total gonorrh | | Total | With gonorrhoea | | | With gonorrhoea | | Total | With gonorrhoea | | Total |
| | % | no. | No. | % | no | No. | % | no. | | No. | % | - no. | | | |
| 15-19 | 0 | 0.0 | 21 | 0 | 0.0 | 5 | 0 | 0.0 | o | 0 | 0.0 | 1 | 0 | 0.0 | 27 |
| 20–29 | 0 | 0.0 | 8 | 3 | 9.1 | 33 | 0 | 0.0 | 3 | 0 | 0.0 | 5 | 3 | 6.1 | 49 |
| 30–39 | 0 | 0.0 | 1 | 2 | 6.5 | 31 | 0 | 0.0 | 5 | 0 | 0.0 | 4 | 2 | 4.8 | 41 |
| 40-49 | 1 | 25.0 | 4 | 3 | 8.6 | 35 | 3 | 16.7 | 18 | 0 | 0.0 | 7 | 7 | 10.9 | 64 |
| 50-59 | 0 | 0.0 | 2 | 4 | 25.0 | 16 | 4 | 25.0 | 16 | 1 | 33.3 | 3 | 9 | 24.3 | 37 |
| 60+ | 0 | 0.0 | 2 | 0 | 0.0 | 21 | 2 | 40.0 | 5 | 1 | 20.0 | 5 | 3 | 9.1 | 33 |
| Total | 1 | 2.6 | 38 | 12 | 8.5 | 141 | 9 | 19.1 | 47 | 2 | 8.0 | 25 | 24 | 9.6 | 251 ª |
| Median age | | | 19.6 | | | 40.6 | | | 48.9 | | | 44.3 | | | 41.4 |

^a The missing 18 men included 16 with bilaterally thickened epididymes, 2 for whom the detailed marital status was not recorded, and 1 who was not adequately examined.

ners (apparently wives in most cases) had received any treatment. Most of the men had continued their normal routine of sexual activity irrespective of the presence of urethral discharge or dysuria. Most of the 32 men with current urethral discharge had had a similar discharge on one or more previous occasions.

As no subject was instructed to hold urine for any length of time before being examined, this may have affected the consistency, amount, or even the presence of the urethral discharge. Thus, some cases may have escaped detection. In fact, there were 13 further

Table 3. Gonorrhoea and selected signs and symptoms in 32 males with urethral discharge

| 6: | | scharge -reported | Discharge not self-reported | | | |
|-----------------------------|-------|----------------------|--------------------------------|---------------------|--|--|
| Sign or symptom | Total | No. with gonorrhoea | Total | No. with gonorrhoes | | |
| thick discharge | 6 | 6 | 4 | 3 | | |
| thin, scanty dis- charge | 6 | 4 | 16 | 11 | | |
| dysuria | 11 ª | 9 | 7 | 6 | | |
| no dysuria | 0 4 | 0 | 13 | 8 | | |
| Total with dis- charge | 12 | 10 | 20 | 14 | | |

^a One case of the 12 with self-reported discharge was excluded because the presence or absence of dysuria was not reported.

males who reported having a current urethral discharge, but this could not be confirmed on examination; at least 4 of these men had already received some treatment.

Women

Table 1 shows that the sample of women with respect to age was representative of the whole District.

Over 88% had had no education and only 2 had been to a secondary school.

In the female sample, 19 (5.5%) were single, 263 (76.7%) were currently married and living with their spouse, and 61 (17.8%) were formerly married but separated, divorced, or widowed. Of the 324 women either currently or formerly married, 76 (23.4%) had never had a liveborn child.

Gonorrhoea. Of the 343 women who came to the clinic, 48 did not undergo pelvic examination. Most of these women were elderly and postmenopausal. Refusal was the main reason among the 14 women below the age of 40 in this group. Of the 295 women who were examined, 54 (18.3%) were found to have gonorrhoea. As over 31% of the women aged 50 or over were not fully examined, this elderly group, along with its 4 cases of gonorrhoea, has been excluded from the description that follows.

Age and marital status. Among women, the age-marital status-gonorrhoea configuration was

| | | Single | | Currently married to man with one wife more than one wife | | | | | Separated, divorced, or widowed | | | All women | | | |
|--------------|-----|--------|-------|---|---------------|-------|-----|---------------|------------------------------------|-----|--------------|-----------|------|-------------|-------|
| Age group | | | Total | | ith rrhoea | Total | | ith rrhoea | Total | | ith rhoea | Total | With | n rrhoea | Total |
| | No. | % | no. | No. | % | no. | No. | % | no. | No. | э. % | no. | No. | % | - no. |
| 15–19 | 3 | 37.5 | 8 | 2 | 15.4 | 13 | 3 | 33.3 | 9 | 1 | 50.0 | 2 | 9 | 28.1 | 32 |
| 20–29 ` | 0 | 0.0 | 4 | 8 | 19.0 | 42 | 8 | 30.8 | 26 | 0 | 0.0 | 3 | 16 | 21.3 | 75 |
| 30–39 | 0 | _ | 0 | 5 | 15.1 | 33 | 8 | 23.6 | 34 | 1 | 16.7 | 6 | 14 | 19.2 | 73 |
| 40–49 | 0 | _ | 0 | 2 | 13.3 | 15 | 5 | 17.2 | 29 | 4 | 57.2 | 7 | 11 | 21.6 | 51 |
| Total | 3 | 25.0 | 12 | 17 | 16.5 | 103 | 24 | 24.5 | 98 | 6 | 33.3 | 18 | 50 | 21.6 | 231 |
| Median age | | | 19.1 | | | 29.3 | | | 34.3 | | | 37.5 | | | 31.2 |

Table 4. Number and percentage of Teso women aged 15-49 with gonorrhoea, by age and marital status

complex, like that of the men; the patterns, however, were strikingly different (Table 4). There was an almost perfect inverse relationship between age and gonorrhoea; women aged 15-19 had the highest rate (28.1%). However, the rate was still quite high (21.6%) in the 40-49 age group.

As regards marital status, the highest rate of gonorrhoea (33.3%) was found among previously married women no longer living with their spouse (i.e., the separated, divorced, and widowed). Single women came next with a rate of 25%. As with men, the rate was higher for those involved in polygamous marriages (24.5%) than for those whose husbands had never had more than one wife (16.5%).

Clinical features. Almost half of the women with gonorrhoea were symptomless, and in almost 40% of the cases none of the signs suggestive of gonorrhoea were prominent. It must be conceded that some less obvious features, such as a mild degree of cervicitis, may have been missed in the circumstances under which the subjects were examined. Over 10% of those examined had symptoms and signs suggestive of salpingitis.

Gonorrhoea and pregnancy. As shown in Table 5, proportionately more of the pregnant women (40.0%) were found to have gonorrhoea than the non-pregnant women (19.8%). This difference was significant (P<0.05). The pregnant group included 3 women in the early puerperium, of whom 2 had gonorrhoea. It should be mentioned that the pregnancy rate among the single women indicated that they were no less exposed to the risk of pregnancy—or to that of gonorrhoea—than the married women of childbearing age.

Table 5. Gonorrhoea and pregnancy in single and married fecund Teso women aged 15-49

| | No. | With gonorrhoea | Without gonorrhoea |
|-----------------------|-----|--------------------|-----------------------|
| Pregnant ^a | 30 | 12 (40.0 %) | 18 (60.0 %) |
| Not pregnant | 162 | 32 (19.8 %) | 130 (80.2 %) |
| Total | 192 | 44 (22.9 %) | 148 (77.1%) |
| | | $\chi^2 = 4.784$ | (<i>P</i> < 0.05) |

 $^{^{\}alpha}$ Including 3 women in the early puerperium, of whom 2 had gonorrhoea.

Further findings in men

In addition to the current evidence of gonorrhoea in men and women mentioned above, the following features were noted in the Teso men. These may be considered as diagnostic concomitants (and some as determinants) of the gonorrhoea status of the community (cf., the spleen rate in malaria).

Dysuria. Of the 270 men interviewed, 70 (26%) stated that they were not able to pass urine freely or easily. This total included 15 cases of currently diagnosed gonorrhoea. At least 2 men were known to have urethral strictures.

Past history of urethral discharge. 150 (55.5%) of the 270 men interviewed gave a past history of urethral discharge.

Epididymis. Perhaps one of the most significant features encountered was the nodular thickening of the lower pole (globus minor) of the epididymis, or

592

more extensive involvement in some cases. A total of 74 men, i.e. 29.3 %, had thickening of the epididymis, 16 of them bilaterally. Of these 74, 56 gave a past history of urethral discharge, of whom 36 said they had had it only once before. It is likely that some of these might have had more repeated infections. As already pointed out, over 50% of the men with gonorrhoea were not aware of any urethral discharge, and one-third did not have dysuria. Possibly owing to repeated gonococcal onslaught, sufficient local immunity to mask the infection builds up. Of the 16 men with bilateral thickening, none was below the age of 30; all 16 were married; 4 had more than one wife; 7 had never had a child; and 15 gave a past history of urethral discharge. Further details on the etiology of bilaterally thickened epididymes and their role in the causation of sterility will be described elsewhere.

Past history of genital sores. 61 (22.6%) of the 270 males interviewed gave a past history of genital sores. While this is not a manifestation of gonorrhoea, the trend is in keeping with a high frequency of sexually transmitted diseases.

Polygamy versus past history of urethral discharge. Of those with more than one wife, 75.0% reported a past history of discharge, as compared with 55.6% of those who had only one wife; this difference was significant (P<0.05).

DISCUSSION

Age, marital status, and gonorrhoea

The interrelationships between age, marital status, and gonorrhoea can be understood when viewed against the demographic and sociocultural context of rural Teso. A major demographic characteristic is the existence of numerical discrepancies between men and women, which are typical of a rural area. Thus, in the age group at which first marriages usually occur (15–30), there is a relative excess of females; this is probably due to the out-migration of young working-age males. This latter phenomenon may also have been one of the main reasons for our not seeing much gonorrhoea among younger men, as the out-migrant group might have included the extroverts, the more vulnerable group.

Culturally, two notable features in Teso are the importance and magnitude of the bride-price, and the emphasis on large family size. For a man, having many children and many wives is a sign of health and wealth and source of much prestige in the community.

The high bride-price has resulted in a relatively high median age at first marriage for men and a low one for women (22.0 years and 16.6 years respectively in the medical sub-sample studied). This age differential, combined with the out-migration of younger men, acts to increase the number of potential wives available per adult male and hence facilitates polygamy. The rather high rates of gonorrhoea undoubtedly contribute to the generally low fertility of Teso women. Therefore, if a man is to produce many children, he must acquire more than one wife. Polygamy, as we have shown, in turn increases gonorrhoea, thus lowering fertility and further encouraging polygamy in a chain of circular causality.

Given a high bride-price, the acquisition of additional wives is limited to those who have accumulated enough wealth, or command enough wealth, to pay the price. It therefore takes time to acquire several wives, which means that the polygamously married men are older on the average than the monogamously married. As they are seeking more children through additional wives, they tend to marry younger women whose reproductive period has just begun rather than women of their own age. This is facilitated by the larger pool of young marriageable women.

The rates of gonorrhoea may be taken to be a crude index of the frequency and, probably more importantly, the variety of sexual contacts. (They are also, of course, affected by the frequency with which treatment is sought, as well as its availability and effectiveness.) The differences in rates among women of different marital status tend to support this interpretation, if it is assumed that intercourse occurs most frequently between those who have the strongest desire to produce children (and the greatest likelihood of doing so)—namely, older polygamously married men and their younger wives. This interpretation is further reinforced by the fact that gonorrhoea rates are highest among the subsequent wives, particularly the youngest among these (Table 6).

An attempt may now be made to ascertain the route by which gonorrhoea is transmitted. There are three groups involved in the polygamous marriage: the husband, the young wives, and the older wives. All probably serve as routes through which gonorrhoea may be introduced into the polygamous family. These are briefly discussed below in order of their probable importance.

(1) The older polygamously married man does not limit his contacts to his wives only. In particular, a man may inherit the wives of a deceased brother or

Table 6. Number and percentage of polygamously married Teso women with gonorrhoea, by age and marital status

| | | First wife | Э | Subsequent wife | | | | |
|------------|-----|---------------|-------|-----------------|-------|------|--|--|
| Age group | | ith rrhoea | Total | gono | Total | | | |
| | No. | % | no. | No. | % | no. | | |
| 15–19 | 0 | 0.0 | 1 | 3 | 37.5 | 8 | | |
| 20–29 | 2 | 29.0 | 7 | 6 | 31.6 | 19 | | |
| 30–39 | 4 | 28.6 | 14 | 4 | 20.0 | 20 | | |
| 40-49 | 2 | 14.3 | 14 | 3 | 20.0 | 15 | | |
| Total | 8 | 22.2 | 36 | 16 | 25.8 | 62 | | |
| Median age | | | 37.5 | | | 32.3 | | |

even father, i.e., his own stepmother, and is indeed entitled to do so by custom. Here, the exceptionally high gonorrhoea rate (57.2%) among women aged 40-49 no longer living with spouse should be mentioned (Table 4). The 4 women in this group who were actually found to have gonorrhoea were widows and hence eligible to be inherited.

- (2) Younger, subsequent wives may bring the disease into the family through either premarital or extramarital contacts. (Extramarital sexual relations are definitely permissible within Atesot culture.) Surprisingly, the gonorrhoea rates among the likely contacts of these women (single or monogamous men of similar age) were low. Such men may, however, be more likely to receive treatment before returning to their partners or wives and hence less likely to have gonorrhoea at the time of survey.
- (3) The older, neglected wives of polygamously married men may seek contacts outside their marriage.

The above comments are put forth primarily as suggestions pointing the way to further research that might answer the fundamental question of why the rate of gonorrhoea is so high in the Teso population. Certainly, the degree of polygamy and promiscuity seen in this group cannot be considered as unique.

Pregnancy and gonorrhoea

The significantly high gonorrhoea rate found in pregnant women in this study (Table 5) immediately raises the question of whether pregnancy is favourable to the gonococcus. There are contradictory views on this subject. An earlier opinion was that

gonorrhoea tends to be more acute in pregnancy (9), although more recently Percival (13) stated that gonorrhoea runs a similar course in pregnant and non-pregnant women. However, there is another possible explanation relevant to the local situation. In Teso it is believed that a woman cannot become pregnant if she has gonorrhoea, and hence pregnancy is considered proof of not having gonorrhoea. Therefore, if a married man has gonorrhoea he may seek treatment for himself and possibly for his nonpregnant wives but not for a pregnant wife, as she "could not possibly have gonorrhoea." Hence, many infected pregnant women remain untreated; almost all their complaints are considered to be due to pregnancy and are often treated by native medicines.

Holland & Bourne (9) also mention the danger of reactivation of an old or latent infection after delivery. The 2 cases seen in the early puerperium in this study may have been induced in this manner.

Lactation and gonorrhoea

In the Teso District sexual intercourse is forbidden during lactation (or until the child starts to walk) because of the belief that the man's spermatozoa may find their way into the breast milk and harm the child. At least in one respect this belief would seem advantageous since it prevents the woman from becoming pregnant while she is breast-feeding and helps to keep the desired spacing for the sake of her health and that of her children, although this reason is apparently not the one commonly given or appreciated. As a result, however, the husband either concentrates on his other wife or wives, if polygamous, or seeks satisfaction elsewhere. Thus this postpartum proscription against sexual intercourse, which may last as long as 18 or even 24 months, may contribute to the high rates of gonorrhoea. However, in this situation, at least in theory, polygamy should be a protective factor against gonorrhoea, but in practice it does not seem to be so, probably because once the gonococcus enters the "pool" of a polygamous family, it remains there.

CONCLUSIONS

Gonorrhoea was found to be highly prevalent in Teso District. Especially in view of the fact that onethird of those affected were symptomless, it is clear that many more cases would have come to light if, for example, other diagnostic procedures had been included, such as obtaining urethral material from all 594 O. P. ARYA ET AL.

subjects. The practice of taking native diuretic herbs and the possibility that some subjects may have emptied their bladders shortly before examination may have resulted in some cases with urethral discharge having escaped detection. Similarly, the yield would no doubt have been increased had material from additional sites been obtained from the women examined, or had superior laboratory facilities been available (our specimens had to be kept and travel long distances in rather "hostile" environments for various lengths of time). Moreover, it is almost certain that our single examination missed at least one-third of the cases, especially among women. Catterall (6) was able to diagnose only 66% of his cases at first attendance.

The host and the environmental factors of the epidemiological triangle of gonorrhoea in Teso District (and possibly elsewhere in Uganda) are complex. The deep-rooted sociocultural factors involved are not easily amenable to any therapy. These factors continue to favour the gonococcus, which seems to have become solidly entrenched in certain communities and areas. There would thus appear to be scope

for mass treatment on a selective basis. At the least, reasonable diagnostic facilities and an appropriate and adequate supply of drugs can be provided. The shortcomings in the existing facilities (3) and other practices, including native medicines, a are only helping to aggravate the situation, thereby reinforcing the vicious circle.

As regards the agent in rural areas, determinations of minimum inhibitory concentrations on a small number of unselected strains showed that over 70% had diminished sensitivity to penicillin (over 0.1 μ g/ml), a rate almost identical with those reported earlier (4).

Thus, only concerted action along the lines suggested is likely to improve the situation. However, isolated improvements in facilities cannot achieve any lasting effect on the control of venereal disease. Similar efforts will have to be made to improve venereal disease services throughout the country (1).

^a Arya, O. P. & Bennett, F. J. The use and misuse of medicines in relation to some sexually transmitted diseases in Uganda. Presented at the Annual Scientific Conference of the East African Medical Research Council, Nairobi, February 1973.

ACKNOWLEDGEMENTS

The authors are grateful to the Government of Uganda for permission to carry out this research project. Appreciation is expressed to the District Commissioners, the local chiefs, and locally recruited staff for their indispensable help and cooperation. Thanks are also due to the medical students who participated in the project, namely Miss I. Bateisibwa, Mr S. Ibanyat, Mr B. Mbonye, Mr J. Mugisha, Mr E. Mwesigye, Mr M. Odeke, Mr W. Ojikan-Odeke, Mr J. Okwera, Mr G. Tumwesigire, and Mr S.

Zaramba for their most helpful technical assistance; to Mr J. C. K. Kabagambe and Mr Abbey R. Bugira for administrative assistance; to Dr Ian Phillips of St Thomas's Hospital Medical School, London, for carrying out the determinations of minimum inhibitory concentrations; and to Dr P. O'Neill of St Thomas's Hospital, London, for performing the serological tests for syphilis. This study was supported by the USAID and by the Population Council, New York.

RÉSUMÉ

ASPECTS CLINIQUES, CULTURELS ET DÉMOGRAPHIQUES DE LA BLENNORRAGIE DANS UNE COLLECTIVITÉ RURALE DE L'OUGANDA

Dans une région rurale de l'Ouganda, on a constaté que la blennorragie était très répandue, en particulier sous ses formes subaiguës et chroniques. Lors d'un examen unique, 8,9% des hommes et 18,3% des femmes étaient atteints de blennorragie en activité; chez un tiers des hommes et chez la moitié des femmes, la maladie était asymptomatique. Chez les hommes, l'affection était surtout fréquente chez les sujets d'âge mûr et chez les polygames; chez 55% d'entre eux, on a relevé des antécédents d'écoulement urétral et chez près de 30% on a constaté un épaississement de l'épididyme. Dans le sexe féminin, la fréquence de la

blennorragie était en relation inverse avec l'âge, bien que plus de la moitié des femmes atteintes aient dépassé la trentaine; elle était plus élevée chez les femmes de polygames et chez les femmes enceintes.

Les auteurs exposent certains des principaux facteurs épidémiologiques — notamment la polygamie, le prix élevé des épouses, les attitudes et les croyances — auxquels semble devoir être attribuée la forte endémicité de la blennorragie dans cette région. Ils examinent également les possibilités d'améliorer la situation et les obstacles à surmonter.

REFERENCES

- 1. ARYA, O. P. Brit. J. vener. Dis., 49: 134 (1973).
- ARYA, O. P. & BENNETT, F. J. Brit. J. vener. Dis., 43: 275 (1967).
- ARYA, O. P. & BOSA, C. B. Brit. J. vener. Dis., 49: 460 (1973).
- ARYA, O. P. & PHILLIPS, I. Brit. J. vener. Dis., 46: 149 (1970).
- 5. Bennett, F. J. E. Afr. med. J., 41: 163 (1964).
- CATTERALL, R. D. Brit. J. vener. Dis., 46: 122 (1970).
- 7. COOK, A. R. J. trop. Med. Hyg., 4: 175 (1901).
- 8. GRIFFITH, H. B. Eugen. Rev., 55: 103 (1963).

- HOLLAND, E. & BOURNE, A. British obstetric and gynaecological practice, obstetric volume, London, Heinemann, 1955, p. 501.
- 10. KIBUKAMUSOKE, J. W. Trans. roy. Soc. trop. Med. Hyg., 59: 642 (1965).
- 11. LOMHOLT, G. & NSIBAMBI, J. *Uganda med. J.*, 1: 109 (1972).
- Mengo Hospital. Mengo Hospital notes from 1897, Albert Cook Library, Makerere University Medical School, Kampala, Uganda.
- Percival, R. Holland & Brews manual of obstetrics, 13th ed., London, Churchill, 1969, p. 231.
- UGANDA, GOVERNMENT OF. Reports on the 1948, 1959 and 1969 population censuses, Entebbe, Government Printer.