Seroepidemiological survey of chlamydial genital infections in Khartoum, Sudan

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SUMMARY A total of 494 patients (90 men and 404 women) attending a sexually transmitted diseases (STDs) clinic in Khartoum, Sudan, were studied to assess the prevalence of chlamydial genital infections. Antibodies to *Chlamydia trachomatis* serotypes D to K were found in four (4.4%) men and 42 (10.4%) women, and 10 (2.5%) women had antibodies to serotypes A to C.

Introduction

Studies in Khartoum have shown that gonorrhoea affects almost 26% of men and 4% of women patients attending a sexually transmitted disease (STD) clinic and that non-gonococcal urethritis (NGU) is the most common STD in men.^{1,2} The prevalence of chlamydial genital infections is unknown, but studies from elsewhere in Africa have suggested that they are as common there as in Europe and the United States. In Ethiopia 32% of men and 45% of women patients with STD were found to have been infected with *Chlamydia trachomatis* genital serotypes.³ In Nigeria the rates were 19% in men and 27% in women patients with STD.⁴

In this study we have attempted to assess the prevalence of chlamydial genital infections by undertaking a seroepidemiological survey of patients attending an STD clinic in Khartoum, Sudan.

Patients and methods

We examined 494 consecutive patients attending an STD clinic in Khartoum with various genitourinary symptoms. Included were 90 men (aged 15 to 40), most of whom presented with urethritis, and 404 women (aged 16 to 65), who mainly presented with vaginal discharge.

We carried out laboratory tests to detect *Neisseria gonorrhoeae*, *Trichomonas vaginalis*, and *Candida albicans*, urine tests for defining urethritis, and the Venereal Disease Research Laboratory (VDRL) test to detect treponemal antibodies in Khartoum as described previously.¹

Whole blood taken by finger prick, urethral discharge from men, and cervical discharge from women were collected on cellulose sponges.⁵ Specimens were stored at 4°C and sent to the London laboratory by post, where they were tested for the presence of antichlamydial antibodies by a micro-immunofluorescence test using pooled antigens.⁶ Serum was examined at starting dilutions of 1/16 for antichlamydial IgG and 1/8 for IgM. Genital discharge was tested for specific antichlamydial IgG and IgA at a starting dilution of 1/8.

Results

Table I shows the clinical and laboratory diagnoses of STDs in all patients based on clinical signs and laboratory tests carried out in Khartoum. Table II shows that antibodies specific for *C. trachomatis* serotypes D to K were found in four (4.4%) of 90 men and 42 (10.4%) of 404 women. An additional 10 women had serum IgG antibodies to *C. trachomatis* serotypes A to C.

The titres of antibodies detected were generally low. The four men who were seropositive had serum IgG antibodies at a titre of 1/16. In the women the geometric mean titre of serum IgG was 1/26, although two women had titres of 1/128 and four had titres of 1/256.

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Accepted for publication 12 September 1984

TABLE I *Diagnoses of patients attending a sexually transmitted disease clinic in Khartoum*

Diagnosis	No (%) of men	No (%) of women
Trichomoniasis or candidiasis	0	211 (52.2)
Gonorrhoea	33 (36.7)	31 (7.7)
Non-gonococcal urethritis	29 (32.2)	0
Lymphogranuloma venereum	2 (2.2)	0
Syphilis (VDRL test positive)	2 (2.2)	10 (2.5)
Others	10 (11.1)	0
No diagnosis	14 (15.6)	152 (37.6)
Total	90	404

Of the 46 patients in whom antibodies were detected, 38 (83%) were aged between 20 and 49, most being between 20 and 29 years old. No patient had antibodies specific for lymphogranuloma venereum (LGV) serotypes of *C trachomatis* or high titres of broadly cross reactive antibodies, which would have suggested infection with LGV. No antibodies to *C psittaci* types were detected in the serum of any patient.

TABLE II *Prevalence of antibodies to Chlamydia trachomatis serotypes D to K in 494 patients attending an STD clinic in Khartoum*

Source and type of antichlamydial antibody	No (%) positive/No tested
Men:	
Serum IgG	4/90 (4.4)*
Serum IgM	0/90
Urethral IgG or IgA	0/90
Women:	
Serum IgG	42/404 (10.4)*
Serum IgM	3/404 (0.7)
Cervical IgG or IgA	7/343 (2.0)

*Geometric mean of titres of serum IgG: men 1/16; women 1/26.

Discussion

The prevalence of gonococcal infections was high in men patients (36.7%) but much lower in women (7.7%), as found in previous reports from Khartoum (men 25.9%, women 3.8%).^{1,2} These findings may reflect the social conditions prevailing in that city. Although prostitution is technically illegal, Taha *et al* noted that almost half the men presenting with an STD had acquired their infection from prostitutes.¹ Thus it would appear that whereas men with gonorrhoea present for treatment this is not true of the women and there must remain a reservoir of undetected gonococcal infections in the female population. Most (52.2%) of the women presenting at the clinic were found to be suffering from candidiasis and trichomoniasis.

The prevalence of infection with *C trachomatis* serotypes D to K (genital pathogens⁷) was low in the patients presenting with STDs in Khartoum (4.4% in

men and 10.4% in women). These figures are much lower than those found elsewhere in Africa; in Ethiopia the prevalence was 32% in men and 45% in women,³ and in Nigeria the figures were 19% in men and 27% in women.⁴ The titres of antichlamydial antibodies detected in Sudanese patients were also much lower than those found in other studies. The geometric mean titre of serum IgG was 1/16 in men and 1/26 in women in Khartoum compared with 1/138 and 1/193 in Ethiopia and 1/37 and 1/71 in Nigeria.

It is odd that there should be such a difference between the prevalence of gonococcal and chlamydial infections in Khartoum, at least in men. Elsewhere *C trachomatis* has been found as a concurrent infection in many patients with gonorrhoea. It is possible that, in Khartoum, chlamydial infections are mild, and patients would therefore not have a great incentive to attend a clinic for treatment. Antibiotics are freely available in Khartoum, and self medication may play a part in the low prevalence of chlamydial infections and account for the low antibody titres found.

Ten women in Khartoum had antibodies to *C trachomatis* serotypes A to C. Although these serotypes are usually associated with trachoma, they can occasionally cause genital infections.⁸ Three of the 10 women with these antibodies had gonorrhoea. Trachoma is endemic in Sudan but is usually mild and is not very common (Jones BR, personal communication). The interaction of trachoma with genital chlamydial infections in communities is not known. A study in Iran, however, showed a low prevalence of chlamydial genital infections (16%) in men patients with STD who lived in an urban area. In surrounding rural areas, where trachoma is highly prevalent, no evidence of chlamydial genital infections was found.⁹

The prevalence of clinical LGV also appeared to be low in Khartoum. Only 3% of men had clinical signs of this disease and in no patient (male or female) were antibodies detected that suggested infection with LGV agents.

Nearly 40% of women and 18% of men presenting at the STD clinic in Khartoum had no apparent infection, and 31.7% of men patients had non-gonococcal urethritis. Our results suggest that very few of these patients were infected by chlamydiae, leaving a large proportion of cases aetiologically undefined.

STD in Khartoum obviously poses a public health problem that requires adequate control and management. It will be interesting to observe whether chlamydial infections assume greater importance in the future, as has been the case in developed countries.

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