Chlamydial genital infection in Ibadan, Nigeria

A seroepidemiological survey

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SUMMARY Sera from patients attending a sexually transmitted diseases (STD) clinic, a family planning clinic, and an antenatal clinic in Ibadan, Nigeria, as well as from male blood donors from the same area were tested for the presence of type specific antichlamydial antibodies using a modified micro-immunofluorescence test.

Among men and women attending the STD clinic the exposure rates to *Chlamydia trachomatis* serotypes D to K (genital pathogens) were 18.7% and 26.7% respectively. Antibody titres suggesting active disease in these men and women were found in 11.8% and 22.7% respectively. The highest rate of exposure (35%) was among women attending the family planning clinic; of these women 25% had antibody suggesting active disease. Titres of IgG antibody in this study were similar to those found among men and women with chlamydial genital infections in the United Kingdom. Antibodies to serotypes D to K were also detected in 10.3% of women attending an antenatal clinic and in 9.9% of male blood donors. The prevalence of antibodies to *C trachomatis* serotypes A to C and lymphogranuloma venereum serotypes was low.

These results suggest that the prevalence of chlamydial genital infections in Ibadan, both among STD patients and especially among those individuals not seeking treatment (family planning and antenatal clinic patients), is high. Since serious sequelae can follow chlamydial genital infections it is imperative to carry out further investigations in this area.

Introduction

In the developed countries of the West, the prevalence of non-gonococcal genital infections (NGGI) is higher than that of gonococcal genital infection.^{1 2} Although no accurate figures are available for most of the developing countries it has been estimated that NGGI are as prevalent in these areas as in the West.^{3 4}

Studies have shown that in developed countries *Chlamydia trachomatis* is responsible for up to 68% of cases of non-gonococcal urethritis in men⁵ and has been isolated from the cervix of up to 31% of women attending sexually transmitted diseases (STD) clinics.⁶ In this study we determined the prevalence of chlamydial genital infections in various groups in

Ibadan, Nigeria, by detecting type-specific antichlamydial antibodies using a modified micro-immunofluorescence (micro-IF) test.

Patients and methods

Included in this study were: 187 men and 75 women who attended consecutively the sexually transmitted diseases (STD) clinic, Ibadan; 160 women who attended consecutively a family planning clinic, 155 women attending consecutively an antenatal clinic for routine advice and examination; and 101 unselected male blood donors from the same town. Patients in the last three groups had no symptoms of overt genital disease.

Blood was taken from all individuals by venepuncture; the serum was separated and stored at -20°C. Sera were shipped to the laboratory in London in the frozen state and stored at -20°C until tested.

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Sera were tested for the presence of type-specific antichlamydial antibodies using pools of purified chlamydial antigens in a modified micro-IF test.⁷ Sera were examined at a starting dilution of 1/16 for antichlamydial IgG and of 1/8 for antichlamydial IgM.

Results

The distribution of antibodies to chlamydial serotypes in the population examined are shown in table I. Antibodies to *C trachomatis* serotypes D to K (genital pathogens) were found in 35 of 187 (18.7%) men and in 20 of 75 (26.7%) women attending the STD clinic. In women attending the family planning and antenatal clinics antibodies to serotypes D to K were found in 56 of 160 (35%) and 16 of 155 (10.3%) respectively. Among 101 male blood donors these antibodies were detected in 10 (9.9%).

The prevalence of IgG and IgM antibodies specific for *C trachomatis* serotypes D to K is shown in table

II. Antibodies suggesting active chlamydial disease were found in 22 (11.8%) men and 17 (22.7%) women attending the STD clinic, in 40 (25%) and six (3.9%) women attending family planning and antenatal clinics respectively, and in five (5%) male blood donors. The distribution of titres of IgG antibody to serotypes D to K is shown in table III.

Antibodies to *C trachomatis* serotypes A to C (trachoma types) were found in a total of 22 of 678 (3.2%) sera from all groups, and antibodies to lymphogranuloma venereum (LGV) types were detected in only two (0.3%) (both from men). Antibodies against *Chlamydia psittaci* serotypes were not detected.

Discussion

The patients attending the STD clinic, Ibadan, presented with a variety of genital diseases. The diagnoses made in these patients included syphilis, gonorrhoea, non-gonococcal urethritis, cervicitis,

TABLE I Distribution of antibodies to chlamydial serotypes in Ibadan, Nigeria

Patient group (sex)	No of patients	Total No (%) with antibodies	No (%) with antibodies to <i>C trachomatis</i> serotypes*		
			A-C	D-K	LGV 1-3
STD clinic (M)	187	40 (21.4)	4 (2.1)	35 (18.7)	1 (0.5)
STD clinic (F)	75	21 (28.0)	1 (1.3)	20 (26.7)	0
Family planning clinic (F)	160	64 (40.0)	8 (5.0)	56 (35.0)	0
Antenatal clinic (F)	155	18 (11.6)	2 (1.3)	16 (10.3)	0
Blood donors (M)	101	18 (17.8)	7 (6.9)	10 (9.9)	1 (1.0)
Total	678	161 (23.8)	22 (3.2)	137 (20.2)	2 (0.3)

*All sera negative for *C psittaci*

TABLE II Prevalence of antibodies to *C trachomatis* serotypes D to K in Ibadan, Nigeria

Patient group (sex)	No	No (%) with IgG	No (%) with IgM	No (%) with antibodies suggesting active infection*
STD clinic (M)	187	35 (18.7)	7 (3.7)	22 (11.8)
STD clinic (F)	75	20 (26.7)	6 (8.0)	17 (22.7)
Family planning clinic (F)	160	56 (35.0)	24 (15.0)	40 (25.0)
Antenatal clinic (F)	155	13 (8.4)	3 (1.9)	6 (3.9)
Blood donors (M)	101	8 (7.9)	2 (2.0)	5 (5.0)
Total	678	132 (19.5)	42 (6.2)	90 (13.3)

*Men IgG ≥ 32 or IgM
Women IgG ≥ 64 or IgM

TABLE III Distribution of titres of IgG to *C trachomatis* serotypes D to K in Ibadan, Nigeria

Patient group (sex)	No	Titres							GMT*
		<16	16	32	64	128	256	>256	
STD clinic (M)	187	152	17	2	10	3	3		1/37
STD clinic (F)	75	55	2	5	6	2	5		1/71
Family planning clinic (F)	160	104	8	15	12	8	7	6	1/72
Antenatal clinic (F)	155	142	7	3	2		1		1/29
Blood donors (M)	101	93	5	3					1/21

*Geometric mean titre of positive sera

epididymitis, vaginitis, candidosis, trichomoniasis, and genital herpes. Some patients presented with vague genital symptoms and others as contacts of patients with STDs. Among 187 of these men and 75 of these women antibodies to chlamydial genital pathogens (*C trachomatis* serotypes D to K)⁸ were found in 18.7% and 26.7% respectively. To the best of our knowledge comparable findings are not available from similar groups elsewhere in the world. Among a group of 146 men, however, with either post-gonococcal or non-gonococcal urethritis in the United Kingdom antibodies to serotypes D to K were found in 25% using the same micro-IF test.⁹ Among 272 women attending a VD clinic in London with various STDs, these antibodies were detected by the micro-IF test in 43%.¹⁰ Therefore, considering the nature of the patient groups studied the prevalence of chlamydial genital infections in the STD clinic in Ibadan is not dissimilar to that found in the United Kingdom. The titres of antichlamydial IgG in men (geometric mean titre (GMT) 1/37) and women (GMT 1/71) in Ibadan were also similar to those found in the United Kingdom among men with chlamydial urethritis⁹ and women with chlamydial cervicitis.¹⁰

When serum IgG titres of ≥ 32 in men and ≥ 64 in women or the presence of antichlamydial IgM are considered to suggest active chlamydial infection,^{9 10} 11.8% of men and 22.7% of women from this clinic in Ibadan appeared to have active chlamydial genital infections at the time of examination. In a previous study from the same clinic, 26% of all patients had NGG.¹¹ Our results suggest that most of these infections may be due to chlamydiae and that women are the main reservoir of infection.

Perhaps the most striking finding of this study is that among 160 women attending a family clinic in Ibadan antibodies to *C trachomatis* serotypes D to K were detected in 35%. Of these 25% had antibody titres suggesting active infection. This prevalence is higher than would be expected in the United Kingdom or USA, where 3% and 11% of women attending family planning clinics had chlamydial genital infections.^{6 12} The titres of IgG among these women in Ibadan (GMT 1/72) were similar to those in the women attending the STD clinic and to those in women in the United Kingdom with chlamydial genital infections.¹⁰

Of 155 women presenting for routine antenatal examinations antibodies to serotypes D to K were found in the sera of 10.3%. Although the IgG was generally of a low titre (GMT 1/29), 3.9% of these women had values suggesting active infection. Similarly, among 101 male blood donors, 9.9% had these antibodies (GMT 1/21) and 5% had evidence of active infection. By comparison, using the same

serological test in the United Kingdom we found IgG antibody to *C trachomatis* serotypes D to K in only 3% of female and less than 1% of male blood donors.¹³ Antichlamydial IgM could not be detected in sera from these blood donors in the UK.

Only two patients, both men, had antibodies to LGV serotypes, indicating a very low prevalence of exposure (less than 1%) in this population. This finding agrees with a previous study in Nigeria, where among patients with STD the prevalence of LGV was also found to be low at 2.5%.³ Few patients (3%) in Ibadan had antibodies specific for *C trachomatis* serotypes A to C, the types commonly associated with hyperendemic trachoma.¹⁴

In Nigeria tetracycline is widely available and commonly abused through self-medication for minor ailments. Although chlamydiae are sensitive to this antibiotic the seroreactivity to *C trachomatis* serotypes D to K was high among the patients studied. Our results from Ibadan suggest that chlamydial genital infections occur among patients attending an STD clinic with a prevalence similar to that found in developed countries. These infections are also prevalent in Ibadan among other groups, in which the disease was mild or asymptomatic. Studies have shown that such conditions as epididymitis, pelvic inflammatory disease, and perihepatitis can result as sequelae of chlamydial genital infections.¹⁵⁻¹⁷ In Africa pelvic inflammatory disease and infertility pose a major problem²; it is therefore imperative that the role of chlamydiae in these diseases receives further investigation.

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