

ORIGINAL ARTICLE

Sexually transmitted diseases and human immunodeficiency virus infections in women attending an antenatal clinic in Abidjan, Côte d'Ivoire

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Summary: A cross-sectional survey was conducted among women attending an antenatal clinic in Abidjan to determine the prevalence of sexually transmitted diseases (STDs) and HIV infection, and to identify factors associated with the presence of gonococcal and/or chlamydial cervical infection. Among 546 women, 3.7% had a gonococcal infection and 5.5% had a chlamydial infection. The seroprevalence of syphilis and HIV was 1.1% and 16.2% respectively. Gonococcal and/or chlamydial cervical infection was associated with young age, the presence of endocervical mucopus and with more than 10 polymorphonuclear leucocytes per high power field in a vaginal smear. None of these associated factors had a large enough predictive value to allow its use as a diagnostic criterion.

Sexually transmitted diseases are common in pregnant women in Abidjan. The development of rapid, inexpensive diagnostic tests for STD is a priority to improve the care of women attending antenatal clinics in the developing world.

Keywords: *N. gonorrhoeae*, *C. trachomatis*, screening, pregnant women, Africa

INTRODUCTION

Control of sexually transmitted diseases (STDs) is now widely accepted as one of the major strategies of HIV prevention in developing countries¹. However, few data exist on the prevalence and distribution of STDs in the general population in these countries.

Control of gonococcal and chlamydial infections is important because of the morbidity they can cause and because these infections have been shown to facilitate the acquisition of HIV infection² and to increase cervicovaginal HIV shedding³ in women. Since laboratory facilities to diagnose STDs are often not available in developing countries, algorithms incorporating risk markers such as young age, having a new sexual partner and being single, have been developed to improve the quality of case management for symptomatic patients⁴. However, these proposed algorithms have not been extensively tested for populations that are largely

asymptomatic such as women attending an antenatal clinic.

We conducted a cross-sectional study to determine the prevalence of STDs including HIV infection and to identify factors associated with gonococcal and/or chlamydial cervical infection in pregnant women in Abidjan, Côte d'Ivoire.

METHODS

From April to July 1992, a cross-sectional survey was conducted among women who were first-time attenders at a large antenatal clinic in Abidjan. The first 10 consenting women registered at the clinic on the 3 days of the week when the study team was present were enrolled in the study. An interview was conducted using a questionnaire on socio-demographic and behavioural characteristics, obstetric history and current urogenital symptoms. During a gynaecological examination using a speculum, the presence of vaginal discharge and endocervical mucopus was noted. Vaginal, cervical and urethral swabs were collected for microbiological diagnosis of STDs, genital ulcers and genital

Table 1. Prevalence of STD and HIV infections among women attending an antenatal clinic in Abidjan, 1992

	No. of women screened	No. of women with condition	Prevalence (%)
<i>N. gonorrhoeae</i>	546	20	3.7
<i>C. trachomatis</i>	452	25	5.5
<i>T. vaginalis</i>	546	72	13.2
Yeasts	546	151	27.6
Syphilis	545	6	1.1
HIV	545	88	16.2
Genital warts	546	11	2.0
Genital ulcer	540	14	2.6

warts were diagnosed clinically, and venous blood was drawn for syphilis serology.

A vaginal wet mount was performed to detect *Trichomonas vaginalis*, yeast and leucocytes. The number of polymorphonuclear leucocytes (PMN) in the vaginal smear was read as \leq or >10 per high power field. Culture for *Neisseria gonorrhoeae* was performed on modified Thayer–Martin medium inoculated with urethral and endocervical swabs. For the detection of *Chlamydia trachomatis* on endocervical samples culture was done in McCoy cells and an enzyme immunoassay (EIA Microtrak, Syva Co, Palo Alto, CA, USA) was performed with confirmatory testing of positive samples. The diagnosis of chlamydial infection was based on a positive result of any of these 2 tests. Cervical infection was defined when a cervical specimen yielded a positive culture for *N. gonorrhoeae* or when a test for *C. trachomatis* was positive. Syphilis was diagnosed in women with a positive rapid plasma reagin test (RPR, Becton–Dickinson, Cokeysville, MD, USA) and a positive *Treponema pallidum* haemagglutination assay (TPHA,

Fujirebio, Tokyo, Japan). Sera were screened anonymously and unlinked for HIV-1 and HIV-2 antibodies according to a previously published HIV screening algorithm⁵.

Data were analysed with the statistical package EPI-INFO. The odds ratio and its 95% confidence interval were used to study factors associated with cervical infection. For factors significantly associated with cervical infection, the predictive value for the diagnosis of cervical infection was calculated as the number of infected women with the factor, divided by the total number of women with the factor.

RESULTS

Overall, 546 pregnant women agreed to participate while only one woman declined participation. Their age ranged from 13 to 48 years, with a mean age of 26 years. During the previous 12 months, 9% of women reported having had more than one sex partner. Overall, 10% of the women attended the clinic for the first time during their first trimester, 60% during their second trimester and 30% during their last trimester of pregnancy. The mean number of pregnancies was 3.6 and the mean duration of the current pregnancy was 5.6 months. On gynaecological examination both vaginal discharge (56%) and endocervical mucopus (14%) were common. More than 10 PMN per high power field in the wet mount was detected in 31% of women.

The prevalence rates of STDs are summarized in Table 1. *N. gonorrhoeae* and *C. trachomatis* were detected in 3.7% and 5.5% of women respectively. Syphilis was detected in 1.1% of women and the overall HIV seroprevalence was 16.2%.

Factors potentially associated with gonococcal or chlamydial cervical infection are presented in Table 2. Being less than 21 years old, having cervical mucopus and having >10 PMN per high

Table 2. Associations between cervical infection with *N. gonorrhoeae* (NG) or *C. trachomatis* (CT) and potential risk markers, symptoms, signs and direct microscopy among women attending an antenatal clinic in Abidjan, 1992

	Number with characteristic among			OR	(95% CI)	PV+*
	Infected with NG/CT	Not infected with NG/CT				
Risk markers						
<21 years	17/39 (44%)	101/406 (25%)		2.33	(1.21–4.50)	14%
Single	14/39 (36%)	104/416 (25%)		1.68	(0.85–3.34)	12%
>One sex partner in past year	6/39 (15%)	38/403 (9%)		1.75	(0.69–4.39)	14%
Symptoms						
Vulvar itching	14/39 (36%)	133/416 (32%)		1.19	(0.60–2.37)	10%
Vaginal discharge	20/39 (51%)	166/415 (40%)		1.58	(0.82–3.04)	11%
Signs and direct microscopy						
Cervical mucopus	12/39 (31%)	57/413 (14%)		2.78	(1.36–5.65)	17%
PMN >10 /HPF	21/39 (54%)	118/412 (29%)		2.91	(1.53–5.53)	15%
Vaginal discharge	26/39 (67%)	233/415 (56%)		1.56	(0.78–3.11)	10%

*PV+=predictive value of the presence of the factor for the diagnosis of gonococcal and/or chlamydial infection
PMN=polymerphonuclear leucocytes; HPF=high power field

power field in the vaginal smear were significantly associated with cervical infection. Being single, having had more than one sexual partner in the past year, and both the symptom and the sign 'vaginal discharge' were not significantly associated with cervical infection. The predictive values for the diagnosis of cervical infection were 14% for being less than 21 years old, 17% for having cervical mucopus, and 15% for having >10 PMN per high power field in the vaginal smear.

DISCUSSION

These data demonstrate that STDs such as gonorrhoea, chlamydial infection and trichomoniasis are frequent among women attending an antenatal clinic in Abidjan. These high rates of STDs are partly attributable to high rates of infection among their stable partners as only 9% of women reported multiple partners during the past year. Screening and treatment for these STDs should therefore be part of the services offered by antenatal clinics. Syphilis was uncommon among the pregnant women in this study in contrast to the high syphilis prevalence observed among pregnant women in other African countries⁶ as well as among Abidjan female sex workers⁷. The HIV seroprevalence of 16% among antenatal clinic attenders observed in this study was slightly higher than the seroprevalence of 12% observed at delivery at the same clinic during the same year⁸. This difference may be explained either because HIV-infected pregnant women are less likely to come to term⁹ or because of selection bias, i.e. the first 10 attenders to the clinic may have been more likely to be symptomatic.

While antenatal clinic attenders are an important population in which to screen for gonococcal and chlamydial infections, none of the factors associated with these infections had a large enough predictive value to allow these factors to be used as diagnostic criteria. This is in agreement with studies that have evaluated diagnostic algorithms for these infections in antenatal clinic attenders¹⁰⁻¹². The search for simple, effective, cheap and rapid diagnostic tests for these infections therefore remains a priority for the control of gonococcal and chlamydial infections in developing countries.

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