

Should family planning clinics provide clinical services for sexually transmitted infections? A case study from Côte d'Ivoire

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Summary

OBJECTIVES To evaluate the quality and usefulness of integrated sexually transmitted infection (STI) care at non-governmental family planning (FP) clinics in Côte d'Ivoire.

METHODS Evaluation components included: (1) a survey measuring the prevalence of STI and the predictive value of the Ivorian vaginal discharge treatment algorithm, (2) client exit interviews, (3) direct observations of client–provider contacts, (4) the monitoring of the clinics' workload and available equipment and supplies and (5) interviews of programme managers and FP providers.

RESULTS Among 368 FP clients surveyed, the prevalence of *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, *Trichomonas vaginalis*, *B. vaginosis* and *Candida albicans* were respectively 1.6, 5.7, 7.1, 44.8 and 5.2%. The positive predictive value of the national algorithm for the detection of cervicitis was only 6.3%, and was 17.9% among a subgroup of young, single women. Of 200 clients interviewed, 96% were satisfied with the services and 95% would return to the FP clinic if they had genital problems. In 215 observed client–provider contacts, 88% of 94 STI cases were correctly managed. Programme managers and providers reported no substantial work overload as a result of the integration of STI services.

CONCLUSIONS The prevalence of cervical infections is relatively low in this population and the Ivorian algorithm that treats all women with vaginal discharge performs poorly. Over-treatment of cervicitis can be reduced by modifying the algorithm, although improved diagnostic tools are urgently needed to detect cervicitis in this population. Continued STI case management at the FP clinics is nevertheless justified because there exists an easily identifiable group of higher risk women who need STI care; and because of the demand by a large proportion of clients, the high prevalence of vaginal pathogens, and the limited costs to the FP programme.

keywords family planning, sexually transmitted infections, integration, Côte d'Ivoire, case management, human immunodeficiency virus prevention

Introduction

Provision of comprehensive reproductive health services was put high on the agenda at the 1994 International Conference on Population and Development in Cairo (UNFPA 1994). Sexually transmitted infections (STI) such as gonorrhoea, chlamydia infection and trichomoniasis, and other reproductive tract infections, such as bacterial vaginosis represent a major public health problem in sub-Saharan Africa. They are important causes of gynaecological and pregnancy-related morbidity (Temmerman 1994), and their role in enhancing the transmission of HIV has been shown (Fleming & Wasserheit 1999). Therefore, the detection and correct management of sexually transmitted and other reproductive tract infections (referred to

as STI from now on in the text) was identified as a critical component of integrated reproductive health services. As a consequence, several countries in Africa and elsewhere started to integrate STI care in existing reproductive health clinics such as family planning (FP) clinics (Kisubi *et al.* 1997; Dehne *et al.* 2000).

In Côte d'Ivoire, the national AIDS programme and the national reproductive health department defined the integration of STI prevention and care in FP and other reproductive health clinics as a national strategy (Programme National de Lutte contre le SIDA, les MST et la Tuberculose de Côte d'Ivoire 1997). In the urban areas of Côte d'Ivoire family planning is still mostly provided by a network of family planning clinics, managed or supported by a non-governmental agency. With support from the

USAID funded regional project for Family Health and AIDS Prevention (SFPS), FP providers and supervisors were trained in correct STI case management using the national syndromic guidelines; the provision of STI drugs was integrated in the existing procurement and distribution systems; and the training, supervision and monitoring tools were adapted.

However, the importance of offering STI care at FP clinics has been questioned (USAID 1998; Shelton 1999; Dehne *et al.* 2000; Mayhew *et al.* 2000). Several studies have shown a weak association between the cervical STI caused by *Neisseria gonorrhoeae* and *Chlamydia trachomatis*, and clinical symptoms and signs such as vaginal discharge (Vuylsteke *et al.* 1993; Dallabetta *et al.* 1998). As diagnosis and treatment of these infections based on symptoms and signs is neither sensitive nor specific, clinical treatment has a limited efficacy. Alternative algorithms using a risk assessment based on socio-demographic and behavioural characteristics perform better, but still introduce serious over-treatment to achieve a limited coverage (Costello Daly *et al.* 1994; Welsh *et al.* 1997; Behets *et al.* 1998; Kapiga *et al.* 1998; Tyndall *et al.* 1999; Iskandar *et al.* 2000; Sloan *et al.* 2000). In the absence of simple, cheap and accurate diagnostic tests, there exists currently no efficient detection and treatment strategy for these infections. In addition, FP clients are mostly women with a relatively low prevalence of cervical STI and sexual risk behaviour whose role in the spread of STI and HIV is thought to be limited. Others have expressed fears that expanding FP services to include STI care may lower acceptance by conventional clients or cause work overload for staff.

In Côte d'Ivoire it was therefore decided to evaluate the usefulness of integrated STI care at FP clinics. The objectives of the evaluation were to assess (1) the prevalence of STI in FP clients and the validity of the current and alternative STI treatment guidelines, (2) the risk profile of the FP population, (3) the quality of the STI care and prevention services, (4) the capacity of the FP programme to offer quality STI care and prevention services, and (5) client satisfaction.

Method

The evaluation consisted of five major components: (1) a survey measuring the prevalence of different STI and the validity of treatment algorithms; (2) exit interviews of clients; (3) direct observations of client-provider contacts; (4) monitoring of the clinic workload, available equipment and supplies; and (5) interviews of programme managers and FP providers.

Prevalence and validity survey

The prevalence and validity survey consisted of a random sample of FP clients who consulted a midwife at three FP clinics in Abidjan in November and December 2000. Clients under 18 years old or in the first 2 days of their menstruation period were excluded. The sample size was calculated to permit the measurement of the positive predictive value (PPV) of the national treatment algorithm for cervical infections with a precision of 10% ($P = 0.05$). During the FP interview, if clients consented to participate, trained midwives completed a standardized and pre-tested questionnaire on socio-demographic, behavioural and clinical characteristics. The midwife performed a gynaecological examination, including a speculum examination, and one endocervical and two vaginal swabs from the posterior fornix were taken. The endocervical swab was kept in a cool box for DNA amplification analysis. One vaginal swab was immediately inoculated in a medium for *Trichomonas vaginalis* culture (Protozoaire Ringer Serum, Sanofi Diagnostics Pasteur, Marnes La Coquette, France), and the other was smeared on a glass slide for microscopic examination. Women with STI syndromes were managed following the national guidelines and received free treatment. Ethical clearance was given by the Ethical Committee of the Ministry of Health of Côte d'Ivoire.

Collected specimens were sent to the Projet RETRO-CI laboratory in Abidjan. The presence of *N. gonorrhoeae* and *C. trachomatis* was assessed by polymerase chain reaction (Amplicor, Roche Diagnostic System, Branchburg, NJ, USA). The *T. vaginalis* culture medium was incubated at 37 °C and microscopically examined at 48 and 96 h. The vaginal smear was Gram stained and microscopically examined for bacterial vaginosis and *Candida albicans*. Bacterial vaginosis was diagnosed if the Nugent score was ≥ 7 or if so-called clue cells were present on the vaginal smear (Nugent *et al.* 1991).

We used EPI-INFO 6.04 (CDC, Atlanta, GA, USA) and Intercooled Stata 6.0 (Stata Corporation, College Station, TX, USA) to analyse the data. Prevalence and odds ratios (OR) with their 95% confidence intervals (CI) were calculated to measure the strength of association between cervical infections (*N. gonorrhoeae* and/or *C. trachomatis*) and the different risk factors. The sensitivity, specificity and PPV of the national vaginal discharge algorithm were calculated, as well as the proportion of women diagnosed with STI. Alternative algorithms for the treatment of cervical infection were developed based on those risk factors that by forward stepwise regression analysis showed to have the strongest independent association. Special attention was given to simple and feasible algorithms with a relatively high PPV.

Client exit interviews

The client exit interviews consisted of face-to-face interviews, between November 2000 and January 2001, of a random sample of consenting clients, aged 18 years or older, who had consulted the midwife at 13 of the 20 clinics supported by the non-governmental sector. All clinics attending to more than 10 clients a day (including the three clinics where the validity survey was conducted) and one in two clinics attending between 1 and 10 clients a day were included. Two clinics that saw less than one client a day were excluded. At the larger clinics the equivalent of the number of clients seen in 1 day was selected and at the smaller clinics the equivalent of the number of clients seen in 2 days. The sample size obtained this way was estimated to be large enough to measure relevant variables with sufficient precision. Two trained female interviewers completed a standardized and pre-tested questionnaire on socio-demographic and sexual characteristics, FP methods, STI symptoms, provider practices and the client's satisfaction.

Direct observations of client-provider contacts

The direct observations of client-provider contacts took place at the same 13 clinics as the client exit interviews, but on a different date. Each midwife was discreetly observed while attending clients. At the larger clinics midwives were observed for one and at the smaller clinics for 2 days. Client characteristics and provider practices were registered on a standardized and pre-tested observation form by two trained female observers. There was no age restriction for observed clients.

Monitoring of clinic conditions and interviews of FP providers and managers

At the 13 clinics, the available conditions, in terms of infrastructure, qualified staff, equipment and supplies and essential clinic statistics were monitored by filling out a standardized inventory guide. All midwives of the 13 clinics were interviewed using a standardized questionnaire, addressing issues of feasibility, acceptability and quality of STI care. Available FP programme managers and supervisors were asked about their perception of the feasibility, acceptability and quality of currently offered STI care.

Results

Prevalence of STI and validity of treatment algorithms

Of 469 randomly selected clients, 88 (18.8%) were excluded because they were menstruating and five (1.1%)

because they were younger than 18 years. Six of the 376 invited clients (1.6%) refused participation. Of the remaining 370 clients, 368 (99.5%) provided biological samples, 360 (97.3%) completed the questionnaire and 358 (96.8%) provided both biological samples and a complete questionnaire. Microscopic slides for the diagnosis of candida infection and bacterial vaginosis were only available for 324 (87.6%) women. The age of the clients ranged from 18 to 53 years, with a median of 28 years. About one-third (32.2%) were not married or having a steady relationship, and 26.2% lived alone. About one-tenth (12.8%) consulted the clinic for a genital complaint.

The prevalence of abnormal vaginal discharge, among the 360 women who completed the questionnaire, varied between 5.6% when generally asked about medical problems, 13.9% when asked if they had a problem in the genital area, 29.1% when specifically asked for vaginal discharge, and 47.6% when including women detected with discharge during clinical examination. When prompted, vaginal burning or itching was reported by 22.7% of clients and lower abdominal pain by 16.7%. During clinical examination, 1.7% were found to have genital ulceration, 3.4% lower abdominal tenderness, 7.0% endocervical mucopus, 8.9% cervical motion tenderness and 33.1% adnexal tenderness.

The prevalences of laboratory-confirmed STIs is shown in Table 1. Bacterial vaginosis was most common, diagnosed in 44.8%. The prevalence of cervical infection was 6.8%, most commonly caused by *C. trachomatis* (5.7%). The association of cervical infection with relevant socio-demographic, behavioural and clinical characteristics is presented in Table 2. Of the measured risk factors only age <21 (OR = 5.08, 95% CI 1.7–14.9) and being single (OR = 2.75, 95% CI 1.1–7.2) were strongly and significantly associated with cervical infection on univariate analysis. The diagnosis of 'vaginal discharge syndrome' by the midwife (defined in the national algorithm as

Table 1 Prevalence of cervical and vaginal infections among family planning clients in Abidjan, Côte d'Ivoire, 2000 ($n = 368$)

Sexually transmitted infection (STI)	(%)	95% Confidence interval (CI)
<i>Neisseria gonorrhoeae</i>	1.6	0.7–3.4
<i>Chlamydia trachomatis</i>	5.7	3.7–8.4
Cervical infections	6.8	4.5–9.7
<i>Trichomonas vaginalis</i>	7.1	4.8–10.0
Bacterial vaginosis ($n = 324$)	44.8	39.4–50.2
<i>Candida albicans</i> ($n = 324$)	5.2	3.2–8.1
Vaginal infections ($n = 328$)	52.7	47.3–58.1

Table 2 Factors associated with cervical infection among family planning clients in Abidjan, Côte d'Ivoire, 2000 ($n = 358$)

Factor	<i>n</i>	Cervical infection (%)	Unadjusted odds ratio (95% confidence interval)
Socio-demographic characteristics			
Age <21	35	20.0	5.08 (1.7–14.9)
Single	114	10.5	2.75 (1.1–7.2)
Sexual behaviour			
Multiple partners in the last 3 months	13	15.4	2.95 (0.0–15.9)
New partner in the last 3 months	36	8.3	1.44 (0.3–5.6)
Symptomatic partner	87	2.3	0.31 (0.1–1.4)
Used condom at last sexual intercourse	31	12.9	2.54 (0.7–8.9)
Genital symptoms and signs			
Consults because of genital complaint	45	8.9	1.59 (0.4–5.4)
Presence of blood	151	8.6	2.33 (0.9–6.4)
Diagnosed with vaginal discharge syndrome	143	6.3	1.04 (0.4–2.7)
Lower abdominal pain	59	8.5	1.67 (0.4–6.6)
Cervical motion tenderness	32	9.4	1.35 (0.0–6.7)
Endocervical mucopus	25	8.0	2.33 (0.9–6.4)

Table 3 Validity of different algorithms for the treatment of cervical and vaginal infection among family planning clients in Abidjan, Côte d'Ivoire, 2000

Algorithm	Treated (%)	Sensitivity (%)	Specificity (%)	Positive predictive value (%)
Treatment of cervical infections ($n = 357$)				
Current algorithm (treat all with vaginal discharge) as applied by the midwives	40.1	40.9	60.0	6.3
Treat only those who spontaneously report abnormal vaginal discharge	14.6	18.2	85.7	7.7
Treat if vaginal discharge and positive risk assessment (WHO criteria)*	7.3	13.6	93.1	11.5
Treat if vaginal discharge and positive risk assessment (adapted criteria)†	4.8	13.6	95.8	17.6
Treat if positive risk assessment (adapted criteria)†	15.3	40.0	86.5	17.9
Treatment of vaginal infections ($n = 324$)				
Current algorithm (treat all with vaginal discharge) as applied by the midwives	42.3	46.4	62.3	57.5

* Partner symptomatic, or two of the following: age <21, new partner in last 3 months, multiple partners in last 3 months, or single.

† Age <21 or, single and reporting multiple partners in the last 3 months.

'abnormal vaginal discharge and/or itching or burning') was not associated with cervical infection (OR = 1.04, 95% CI 0.5–2.4).

Table 3 presents the validity of different treatment algorithms for cervical and vaginal infections. The national algorithm that instructs the midwife to actively procure genital symptoms and signs, and to treat all women with vaginal discharge syndrome for both cervical and vaginal pathogens, performed poorly. In total 40.1% of clients were diagnosed as having vaginal discharge syndrome. The sensitivity, specificity and PPV for the treatment of vaginal pathogens were, respectively, 46.4%, 62.3% and 57.5%, and for the treatment of cervicitis 40.9%, 60.0% and 6.3%. An algorithm using a risk assessment based on age

under 21 years old, or being single and having multiple partners in the last 3 months, treated 15.3% of the women, with a sensitivity of 40.0%, a specificity of 86.5% and a PPV of 17.9%.

Socio-demographic and behavioural profile of FP clients

In addition to the prevalence survey, risk factors were measured in the client interview survey and the direct observation survey. In total 200 clients were interviewed. Information on the number of clients who refused participation was collected only at six clinics. At these clinics, 22 of 116 women (19%) who were invited refused to participate. In total, 215 clients were observed. The

Profile	Prevalence survey (<i>n</i> = 360)	Clients interviewed (<i>n</i> = 200)	Clients observed (<i>n</i> = 215)
Age (mean)	29.9*	26.9*	26.2
Age <21 (%)	10.1*	20.6*	22.7
Single (%)	32.2	36.2	31.3
New partner in last 3 months (%)	10.3	12.0	NA
Multiple partners in past 3 months (%)	3.6	2.0	NA
Used condom at last sexual intercourse (%)	8.9	15.5	NA

* Women under age 18 were excluded.

risk factors measured in the three surveys are summarized in Table 4. Most clients reported low risk behaviour. They were living in a steady relationship and reported only one partner in the past 3 months. However, a substantial proportion of women were single (32.2%, 36.2% and 31.3%, respectively of participants of the prevalence survey, interviewed clients and observed clients) and under 21 years old (22.7% of observed clients, the only study sample where all ages were included).

Quality of STI care and prevention

The quality of the different components of STI/HIV care and prevention as measured by the direct observations and the client interviews are summarized in Table 5. With the exception of condom demonstration, providers performed consistently better under direct observation than as reported by clients. Under direct observation, almost all (97%) women were asked if they had any genital complaints and underwent a physical examination, including a speculum examination. In contrast, only 34% of interviewed clients reported to have been asked about genital complaints and 59% to have had a speculum examination. Almost half (44%) of observed clients received a STI treatment, but only 30% of interviewed clients reported receiving STI treatment. Further, from the clinic records, only 10% of the total number of women seen by the midwives in the period January–August 2000 were documented to have a STI.

Sexually transmitted infection case management under direct observation was good. Of the 94 women diagnosed with an STI syndrome, 75% received the corresponding treatment kit. The remaining women were prescribed a treatment. For 42% of these the choice and dosage of the drugs was correct, leading to a total of 88% of patients correctly treated following the national guidelines. Almost all (97%) patients were explained how to take the treatment and partners were correctly notified in 90% of

Table 4 Socio-demographic and behavioural profile of family planning clients in Côte d'Ivoire, 2000

Table 5 Quality of Sexually transmitted infection (STI) prevention and care by the midwives in family planning clinics in Côte d'Ivoire, 2000

	Client-contact observations (<i>n</i> = 215)	Client interviews (<i>n</i> = 200)
Minimal sexual risk assessment*	52.6	NA
Condom promotion	68.4	40.0
Condom demonstration	13.7	19.0
Active detection of STI†	92.6	34.0
Complete genital examination	96.7	59.1
Diagnosed with an STI syndrome (<i>n</i> = 94)‡	44.0	29.5
Correct STI treatment	88.0	NA
Explained how to take treatment	96.8	57.6
Partner notification	90.4	54.2

* Asked at least about recent sexual partners and about condom use.

† Asked for the presence of specific genital symptoms.

‡ Only clients diagnosed with a STI syndrome are included.

cases. However, only 58% of interviewed clients who were diagnosed with an STI reported to have received instructions on how to take the treatment and 54% on notifying their partner.

Risk assessment as assessed by direct observations and exit interviews was poor. Only 53% of observed women were asked if they recently had more than one partner and if they use condoms. To 68% the importance of regular condom use was explained, 14% were shown how to use a condom and 10% were given condoms by the midwife. Of the interviewed women, 40% reported that the midwife talked about condoms and another 19% said that condom promotion took place before seeing the midwife. Use of condoms was reported to have been demonstrated by the midwife by 19% and before seeing the midwife by another 22%.

Capacity of the FP programme to deliver quality STI care services

Only one of the 13 visited clinics did not have a midwife who was trained in improved STI care. In nine clinics the conditions for a private interview were considered good and in four reasonable. All clinics had examination tables with gynaecological supports, sufficient gloves and injection material. Only one clinic did not have a standing lamp and four did not have sufficient specula. At the time of the visits, only seven clinics were stocked with the national pre-packaged treatment kits for vaginal discharge syndrome and six for genital ulceration.

From clinic records, the average number of clients seen per midwife per day was estimated to be around 13. The average consultation time during direct observations was 13.7 min. All of the 18 interviewed midwives found that the integration of STI care was a good idea, four reported it did introduce a work overload and only one said she did not have sufficient time for it. Only five midwives reported that they routinely include a risk assessment during client interview.

None of the FP programme managers objected to the integration of STI care and they reported the extra workload for the system was minimal. The most difficult component to integrate was said to be the procurement and provision of the STI treatment kits. Although STI kits represent only a fraction of the total FP supplies to be procured and distributed, the integration of the procurement had known delays which explained the low availability of STI kits at the time of the survey. The programme managers reported that the problem was resolved and guaranteed adequate provision of STI treatment kits in the future.

Client satisfaction

The findings on client satisfaction are presented in Table 6. Almost all 200 interviewed clients (96%) were generally satisfied with the reception and midwife, 5% were a little embarrassed by the questions regarding genital complaints and 13% were embarrassed or a little embarrassed by the genital examination. Almost all clients (98%) found the FP clinic an appropriate place for addressing STI/HIV issues and 96% claimed they would consult the FP clinic if they had genital complaints. About one in 10 of the interviewed clients (11%), the observed clients (10%) and the participants of the prevalence survey (13%) consulted the clinic principally because of a genital complaint.

In Cote d'Ivoire STI treatment kits are sold at cost recovery price. Of 52 clients who had been prescribed a STI treatment, 62% found the price affordable but 16% said they would not buy the treatment because it was

Table 6 Satisfaction of family planning clients with the offered sexually transmitted infection (STI) services, Côte d'Ivoire, 2000 ($n = 200$)

	(%)
Satisfied with reception and midwife	96.0
Were a little embarrassed by questions on genital problems ($n = 80$)*	5.0
Were embarrassed or a little embarrassed by genital examination	13.4
Agreed to pay the price of the STI treatment ($n = 52$)†	80.8
Thought family planning (FP) clinic is an appropriate place for addressing sexual behaviour issues	97.5
Will consult FP clinic if they had a genital complaint	95.5

* Only clients asked about genital problems are included.

† Only clients diagnosed with a STI are included.

prohibitively expensive. Eleven of the 18 interviewed midwives said not all clients accepted to pay and 12 thought clients did not always buy the prescribed treatment.

Discussion

Our study is consistent with previous studies in sub-Saharan Africa and elsewhere which have shown a low level of association between vaginal symptoms and cervical infections, particularly in women with a low risk profile such as FP clients. We found no association at all between vaginal discharge syndrome and cervicitis, and the national algorithm did not perform better than random treatment. If women were specifically asked about genital symptoms and thoroughly examined, the syndrome was extremely common. A systematic treatment of cervical infection in all women with vaginal discharge syndrome is clearly not justified in this context.

An additional problem is the definition of genital complaints. The prevalence of genital symptoms and signs varied substantially when measured in different ways. The prevalence of abnormal vaginal discharge varied from about 5% spontaneously reported to about 50% combining actively solicited symptoms with signs detected during clinical examination. The PPV of the treatment algorithms for cervicitis did not vary substantially by how vaginal discharge was detected. The degree of over-treatment will therefore mostly depend on how genital complaints are defined.

Some studies have explored alternative algorithms based on a risk assessment using socio-demographic and behavioural characteristics. Although some characteristics, such as young age and being single, consistently were associated with cervical infection, none of the studies identified algorithms that were able to detect most of the cervical

infections (high sensitivity) without introducing serious over-treatment (low PPV) (Welsh *et al.* 1997). We found similar results: cervicitis was associated with age, marital status and the number of reported partners. An algorithm based on these characteristics improved the PPV from 6.3% to 17.9%, but had a similar poor sensitivity of 40%.

Almost all FP clients invited to participate in the prevalence survey accepted, but about one-fifth were excluded because of being at the beginning of their menstruation period. Prevalence of vaginal discharge in these women may be different than in other women and our results may have been slightly different if they had been included. But there is no reason to believe that the national algorithm would have performed better. Adolescents under 18 years old were also excluded; thus we have no data on the prevalence of STI in this group, and the high prevalence in young women only relates to those aged 18, 19 and 20 years old. The PPV may be reduced if these younger girls are included. From other surveys we know that they only represent about 5% of the FP clients aged under 21 years and the effect should therefore be minimal.

Our conclusion on the diagnostic algorithms is similar to those of other studies, namely that in the absence of more accurate and affordable diagnostic tests, few STIs will be efficiently detected in women attending the FP clinics in Côte d'Ivoire. The integration of STI care in these FP clinics as a strategy to control STI, and consequently reduce HIV infection, in FP clients as a whole will therefore have a limited impact. Nevertheless, we do think that in the Ivorian context STI services including care should continue to be offered at FP clinics and that it has important public health benefits, providing the treatment algorithms are reviewed. First, a subset of higher risk women can be easily identified. Particularly, the important group of single young women should not be neglected. This is a population that is increasingly recognized as extremely vulnerable for STI and HIV, and an important group to target for improved reproductive health services. This population represents about 15% of clients attending FP clinics in Côte d'Ivoire and their visit to the clinic is an unique opportunity for individual counselling on risk reduction sexual behaviour and condom use. The prevalence of cervical STI in this subgroup was almost threefold higher and a presumptive treatment may be justified.

Secondly, most discussion on the need for STI care in FP clinics has focused on cervical STI. But there is evidence that vaginal disturbances such as bacterial vaginosis and trichomoniasis may play a role in HIV transmission as well (Laga *et al.* 1993; Taha *et al.* 1998; Koumans & Kendrick 2001) and be possible causes of upper genital tract infections (Cotch *et al.* 1997; Koumans & Kendrick 2001; Morris *et al.* 2001). The prevalence of bacterial vaginosis

was extremely high in this population and a correct treatment of this condition may have an important public health impact. The national algorithm performed rather poorly for the detection and treatment of vaginal infections. Sensitivity was low, because more than half of the bacterial vaginosis, trichomoniasis and candidosis cases were asymptomatic. This is in accordance with what has been found elsewhere. In contrast to symptomatic cases, the role of asymptomatic cases in enhancing HIV transmission and as a cause of gynaecological complications is not sufficiently clarified, and the importance of their detection and treatment remains unclear. In addition, the specificity and positive predictive value were low and in about 40% of women with vaginal discharge syndrome no diagnosis was made. This could be partly explained by vaginal discharge cases caused by pathogens other than the one detected by our reference tests and by problems of sensitivity of the tests. We believe that it is mostly explained by problems in the correct definition of what is an abnormal discharge. The positive predictive value remained nevertheless sufficiently high to justify a systematic treatment of all vaginal discharge cases for bacterial vaginosis/trichomoniasis.

Thirdly, and maybe most importantly, there seems to be a clear demand for this type of service. Almost all women found the FP clinic an appropriate place for STI prevention and care, and about 10% of women consulted the clinic specifically because of genital complaints. This is a context where STI care outside the non-governmental organization (NGO) supported FP clinics is mostly offered by the public health sector which often suffers a lack of appropriately trained staff and sufficient supplies.

The cost of STI treatment is a barrier for some women. In Côte d'Ivoire a cost recovery scheme is used and the price of a treatment kit for vaginal discharge syndrome is around 2 USD. This price is uniform across both the FP clinics and the public health clinics.

Finally, it has been argued that adding STI care to FP services may overburden FP providers and programme support systems. This was not the case in our setting. The NGO supported network of FP clinics is well equipped and has qualified and well-trained staff. The integration of STI care did not pose major problems for the programme in terms of training, supervision, monitoring or the provision of supplies. The problem of the procurement of STI drugs was an organisational one, rather than a lack of capacity, and is believed to be resolved. The current workload per midwife allows for sufficient time per client to include STI case management in most clinics.

The quality of STI case management under direct observation was good in our setting. Côte d'Ivoire uses a system of pre-packaged STI treatment kits which simplifies

the provision of correct treatment. However, the quality of STI care as reported by the clients differed substantially from observed practices. According to the interviewed clients, active solicitation of symptoms does not seem to be carried out on a routine basis. This was consistent with the relatively low number of reported STI in the clinic records. It is probable that the care providers adapted their practices because of being observed. This is a phenomenon that has been reported elsewhere (Franco *et al.* 1997; Saidel *et al.* 1998).

The main objective was to evaluate the usefulness of integrated STI care as part of FP services. No doubts had been raised about the usefulness of STI/HIV prevention. The national Ivorian guidelines instruct the midwives to assess the risk of FP clients, followed by individual counselling and condom promotion. However, this component appears to be more difficult to implement than STI case detection and management. Most midwives admitted not to assess risk, and under direct observation they performed rather poorly in risk reduction counselling. This was demonstrated by the relatively low level of STI/HIV knowledge and condom use in interviewed high risk clients, even those who were not first attendants (results not shown). We feel that the difficulties for the midwife to initiate a private, sensitive and time-consuming conversation on sexual behaviour are underestimated and need further attention.

Conclusions

Even in the absence of accurate tools to detect cervical infections, STI care remains a useful and important service to be offered at the Ivorian FP clinics. There exists an easily identifiable group of higher risk women who need counselling, condom promotion, and STI care. In addition, STI care is worthwhile because of the high prevalence of vaginal pathogens, the demand by a great proportion of clients and the limited costs to the FP programme. To assure quality STI prevention and care, close supervision and monitoring remain essential.

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