

SEXUALLY TRANSMITTED DISEASES

THIRD EDITION

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Chapter 102

Approach to management of STDs in developing countries

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WHAT MAKES CASE MANAGEMENT OF STDs DIFFERENT IN DEVELOPING COUNTRIES?

In theory, appropriate management of STDs is based on the same criteria worldwide. However, in practice, the approach taken to STD case management may differ according to the realities of a specific setting. We will consider three aspects of STD management that differ between developing and developed countries, including the aspect of the provision of treatment, the characteristics of the patients, and the disease profile. Some of these features concern health care in general, whereas others are specific for STD care itself.

THE PROVIDER

Whether STD case management is provided by a primary health care worker or a clinician in a categorical STD clinic, logistic problems often are similar. An obvious hurdle for any health care provision is the poor infrastructure in many developing countries. Bad roads and poor transport facilities make accessibility to the services difficult. In many places, a consultation room is not available or is underequipped, and privacy often is lacking. Laboratory facilities may not exist and, where they do, they may not be efficient or capable of performing the relevant tests. Clinicians who can provide comprehensive case management often must work without the help of health educators, contact tracers, counselors, or administrative personnel. The maximum time that can be spent per patient is often not more than 5 to 10 minutes.

Another, and probably a most important, problem is the lack of a continuous and sufficient supply of drugs or the absence of effective, in general more expensive, drugs for the treatment of STD.

THE PATIENT

The patient's belief in the efficacy of treatment by a formal Western-type health service is, in general, weaker in developing countries than in the industrialized world. Many patients continue to consult traditional healers, especially for STD, and self-medication is common.¹ Some may first go to the informal sector, and only later, when this treatment does not appear to work, present at a clinic.² Seeking treatment in an appropriate health service and compliance with treatment are also related to other social, economic, and cultural factors.³ Many people may simply be too poor to pay for the transport to and from the health service or for a consultation or for the drugs (full-treatment regimen). However, in many developing countries, the dependence of women on men and their inferior social status may also play a major role.¹ For example, women may not have the time to go to the health center, and STD clinics often are stigmatizing for them. Many women cannot afford informing their husband of the presence of a STD

for fear of being blamed for infidelity and hence, of being chased away from the family. In some societies, women need the permission of their husband to consult a health service. Some women may thus wait too long or never seek treatment.⁴

Another aspect that may complicate effective STD management is the patient's capacity to recognize the symptoms correctly. A good example is provided by Rwanda, where high production of vaginal flow during sex is much appreciated.⁵ Vaginal discharge may thus be perceived not as a sign of disease but as an indication of sexual health. However, seeking treatment for STDs presupposes the perception of a problem. In sum, the patient's capacity to seek timely treatment in an appropriate health service is directly affected not only by the availability, accessibility, and affordability of such services but also by his or her capacity to recognize the symptoms correctly, his or her belief in the efficacy of the health service, and by his or her social, economic, and cultural environment. In developing countries, these factors are certainly different from the industrialized world and many remain poorly understood.

THE DISEASE

Although the remainder of this chapter deals in detail with case management of STDs, a few general points are highlighted here.

Both the prevalence and the incidence of STDs tend to be considerably higher in developing countries than in the industrialized world. The relative distribution of the various STDs takes on a different disease spectrum, such as higher relative frequency of chancroid as a cause of genital ulcer or *N. gonorrhoeae* as an etiological agent in urethritis.^{2,6} Some STDs, such as granuloma inguinale, are virtually only seen in developing countries. The high rates of HIV infection in many geographic areas may have repercussions on the natural history and response to treatment of STDs.^{7,8}

In many parts of the developing world, resistance to drugs, such as penicillins and tetracyclines, increased rapidly over the past two decades. This results in the need for more expensive effective drugs for the treatment of gonorrhea and chancroid.^{9,10}

Finally, in developing countries, patients with STDs tend to present with more severe and a higher frequency of STD-related complications, which is largely a result of delayed treatment or lack of effective treatment.

STD SYNDROMIC CASE MANAGEMENT

STD case management should be completed during one patient visit, using simple diagnostic methods that are neither time-consuming nor expensive. A clinical approach has the advantage of offering prompt diagnosis and hence prompt treatment. However, a clinical "etiological" guess may be highly inaccurate for STD. It is, for instance, very difficult to differentiate between gonococcal, nongonococcal urethritis, and mixed etiology, on the basis of clinical observation only. Similarly, the "typical" clinical presentations of primary syphilis, chancroid, and genital herpes, have a low diagnostic accuracy.^{6,11,12} Moreover, it is impossible to identify clinically dual or mixed infection, which are both very common. Many laboratory tests for STD diagnosis are too sophisticated, and generally are not available in most settings. Simple, rapid, and affordable tests for the diagnosis of chlamydia infection or chancroid have been on the priority list for STD research for years, but as yet remain unavailable.

The "syndromic" approach does not require identification of the underlying etiology. Instead, it is based on the identification

of a syndrome, that is, a group of symptoms and easily recognized signs associated with a number of well-defined etiologies. Treatment is provided for the majority of the organisms locally responsible for the syndrome.

Many developing countries have adopted the syndromic approach in their national STD guidelines. These guidelines have been adapted to the local infrastructure and examination possibilities (e.g., possibility of a speculum examination) and to the regional epidemiological situation. Sometimes, adaptation to local circumstances will require a validation of the diagnostic approach used in the flowcharts. This validation consists of a comparison of the diagnostic outcome of the flowchart to a "gold standard." As such the sensitivity, specificity, and predictive value of the approach for the different STDs will be determined.

COMPREHENSIVE CASE MANAGEMENT

A syndromic approach should offer more than a diagnosis and treatment alone. Compliance, counseling, condoms, and contact notification and treatment are the four keys to comprehensive case management.

Compliance with treatment is very important not only for cure, but also for preventing transmission of infection to a sexual partner, although single-dose therapy should be used whenever possible. Explaining the mechanisms of transmission and the complications of no or incomplete treatment will help to motivate the patient to take the full course of antibiotics and to refrain from sex during treatment.¹³

During the contact with the patient, the opportunity should not be missed to provide health education about STD and HIV prevention, and this should include a demonstration of correct condom use. An STD patient is, by definition, a person who is at increased risk for HIV because of his or her high-risk behavior. In addition, his or her vulnerability to HIV infection is increased by the very presence of STD, which increases the risk for acquisition of HIV. More comprehensive counseling (e.g., for HIV testing) will not be possible in most situations in developing countries, because of limitations in time and personnel.

Condoms should be available in every health service that provides STD case management. Whether they should be handed out free or sold depends on local policy.

Asymptomatic partners who would not seek treatment can be reached by partner notification and treatment. However, some of the problems associated with partner notification are more apparent in developing countries. Active contact tracing by telephone, mail, or home visits often is not possible. The use of contact cards, which are handed over by the index patient, is a simple and cheap way to bring in partners for treatment, as was illustrated in Zimbabwe.¹⁴ Moreover, a large proportion of STD are contracted during commercial sex activities, which further complicates contact notification and treatment. Thus, in Nairobi, 37 percent of male STD patients named a prostitute as the source of their infection, and another 27 percent named a casual pickup.³ In Blantyre, 64 percent of the men with urethritis had sex with a bar girl in the previous month.²

Another problem in developing countries is the social inequality between men and women, which makes it extremely difficult for a woman to inform her husband of a STD. In such situations, many women are blamed for the disease and face violence or even expulsion by their husbands. On the other hand, experience from Zambia and Kenya shows that a large proportion of male partners of pregnant women with syphilis were willing to come to the antenatal clinic for treatment for syphilis.¹⁵

In conclusion, every contact between a STD patient and a health

care worker is a unique opportunity to give preventive messages, promote condom use, and, where possible, promote treatment of at least one partner.

COMMON STD SYNDROMES IN DEVELOPING COUNTRIES

URETHRAL DISCHARGE

Urethritis is probably the most common STD syndrome in men in developing countries.^{3,16} In many parts of the developing world, the estimated incidence of urethritis is considerably higher than in developed countries. For example, in a population-based study in two cities in Cameroon, 10 percent of the interviewed men reported at least one episode of urethritis during the past 6 months.¹⁷ This proportion was even higher (20%) among male bar clients.¹⁷ In a similar study in a rural area of Tanzania, the annual incidence was 7 percent.¹⁸ These figures stand in sharp contrast with those reported for Europe and North America, where the annual incidence of urethritis in men is less than 1 percent.^{19,20}

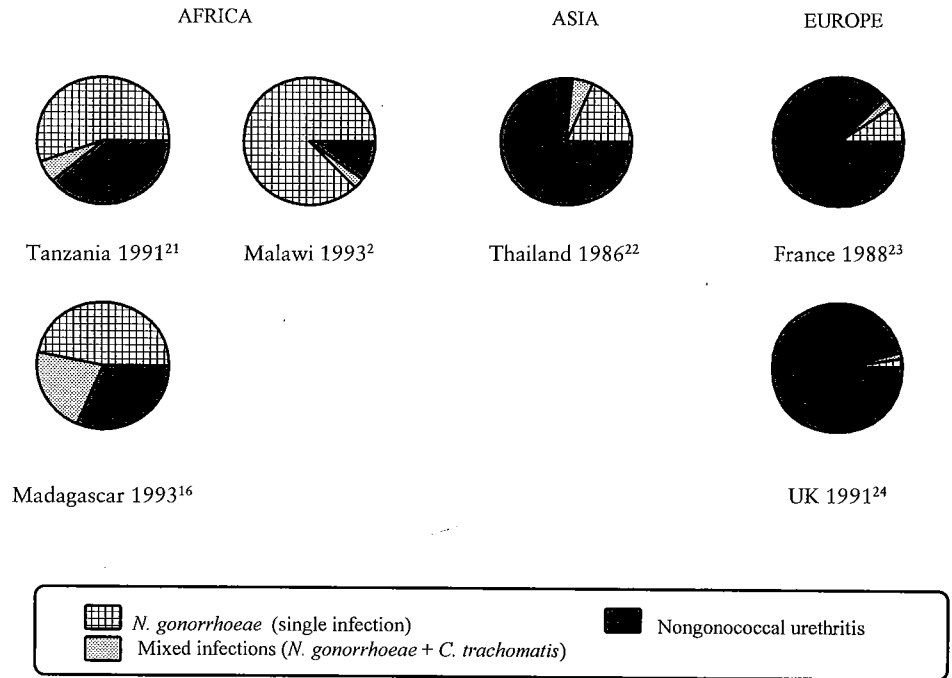
Another striking difference in the epidemiology of urethritis in developed and developing countries relates to its etiology (Fig. 102-1). Although *Chlamydia trachomatis* and *Ureaplasma urealyticum* are the major causes of urethritis in the developed world, *N. gonorrhoeae* continues to be the major cause of urethritis in many developing countries.^{2,16,21} However, owing to the many difficulties surrounding the diagnosis of chlamydial infection, the presence of multiple etiological agents tends to be underestimated in these countries. Given these etiological patterns, a syndromic approach of urethritis requires a treatment for both gonorrhea and nongonococcal urethritis (NGU).

Figure 102-2 gives examples of flowcharts for the management of urethral discharge. In the first example, a simple syndromic approach is adopted, whereby every patient complaining of urethral discharge and/or dysuria is treated for both gonorrhea and nongonococcal urethritis. It is important to rely on patients' reports rather than on the clinical sign of urethral discharge, since discharge is not always visible. This approach is of particular relevance in large parts of Africa, where many people combine treatment from a variety of places. In Malawi, for instance, 53 percent of patients with urethral syndrome reported to have sought treatment elsewhere before consulting the formal health sector.² As such, if urethritis is only treated when discharge is visible during physical examination, many infections may be missed and remain untreated.

To decrease overtreatment and diminish consumption, some countries have adopted a policy of sequential treatment, that is, first treatment for gonorrhea and, failing this, treatment for NGU. The success of sequential treatment obviously depends on the patients' compliance to return to the health service if initial treatment has failed. In reality, such compliance is low and sequential treatment, therefore, is no longer recommended.¹³

An alternative method to decrease the cost of a syndromic treatment consists in including simple laboratory tests for detecting gonococci, as shown in the second example in Fig. 102-2. A Gram stain is used for the detection of intracellular diplococci in urethral discharge. Including a Gram stain in a diagnostic flowchart for urethritis should be advised only when appropriate laboratory facilities are available and results can be given within reasonable time delays, that is, no return visit is necessary for treatment. However, gonococcal infection cannot always be excluded by Gram stain.

Fig. 102-1. Etiologies of urethritis in selected developing and industrialized countries.



In optimal conditions, the Gram stain has a sensitivity of 90 to 95 percent and a specificity of 95 to 100 percent for the detection of intracellular diplococci.²⁶ However, its validity, and hence the validity of a diagnostic flowchart, including Gram stain (see Fig. 102-2), varies substantially with the experience of the laboratory technician and the field conditions within countries.²⁷

A syndromic approach of urethritis requires a treatment for both gonorrhea and nongonococcal urethritis. In recent years, antimicrobial resistance to the commonly available antibiotics such as penicillin, trimethoprim/sulfamethoxazole, thiamphenicol, and the tetracyclines has been increasing in many parts of the developing world (Table 102-1). These relatively inexpensive antibiotics, therefore, no longer can be recommended as a first choice treatment option in many countries. However, antibiotics with 95 percent efficacy, such as spectinomycin, ciprofloxacin, and azith-

romycin, are much more expensive and often not affordable in many populations. In practice, drug choices therefore are often a trade-off between drug efficacy and the cost of treatment.

Establishing appropriate treatment strategies is further complicated by the fact that resistance patterns are changing rapidly. In Hong Kong, for example, the proportion of penicillinase-producing *N. gonorrhoeae* (PPNG) declined from 25 to 4 percent in less than 2 years. In this same period, the 4-fluoroquinolone resistance increased from 0.5 to 10.5 percent.³⁴ This illustrates the importance of monitoring of drug resistance patterns at regular intervals within countries.

In contrast to gonorrhea, infections caused by *C. trachomatis* can be cured using the classic treatment with tetracyclines (doxycycline, tetracycline). However, compliance may be a problem as 7 days of uninterrupted treatment is required.

Fig. 102-2. Examples of flowcharts for the management of urethral discharge. *ICDC: Intracellular diplococci

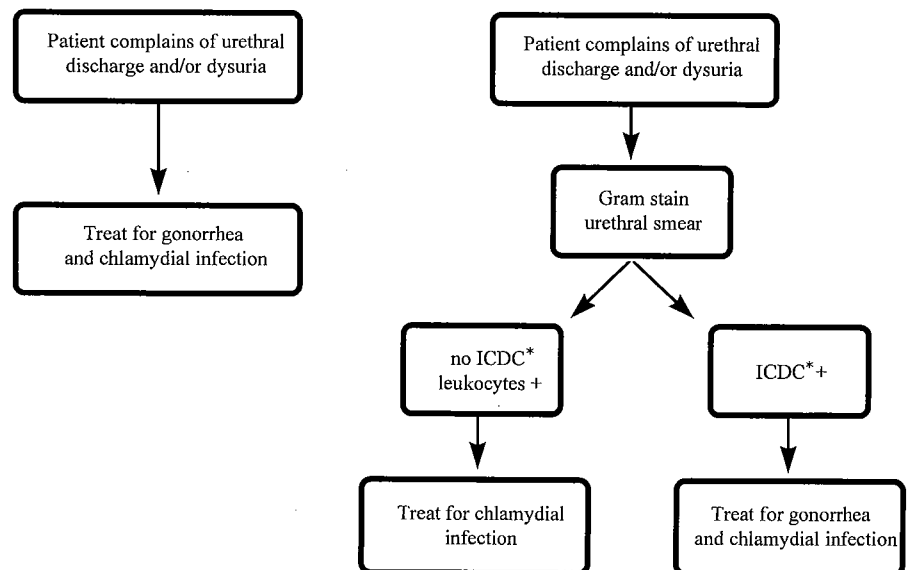


Table 102-1. In Vitro Resistance of *N. gonorrhoeae* against Selected Antibiotics in Africa (1988–1994)

Site, year (ref.)	Percentage of strains resistant to					
	Penicillin		Tetracycline		TMP/SMZ, %	Kanamycine, %
	PPNG, %	CMRNG, % (non-PPNG)	TRNG, %	CMRNG, %		
Ethiopia 1990 ²⁸	73	19		0	77	13
Ghana 1991–1993 ²⁹	94		0	68	100	
Rwanda 1989 ³⁰	41	39	64	60		0
Senegal 1988 ³¹	24	4		7		0
The Gambia, 1990 ³²	49	52	0	92		
Zaire (1988–1990) ³⁰	67	20	45	38		
Zimbabwe 1988 ³³	67	53		16		0

PPNG: Penicillinase-producing *N. gonorrhoeae*.

CMRNG: Chromosomally mediated resistant *N. gonorrhoeae*.

TRNG: Tetracycline-resistant *N. gonorrhoeae*.

TMP/SMZ: Trimethoprim/sulfamethoxazole.

SWOLLEN SCROTUM

Acute infectious epididymitis in men aged between 15 and 35 years is usually sexually acquired.³⁵ It is a common complication of urethritis, with which it shares the same etiological agents. In a study conducted in South Africa, 78 percent of the urine samples of men with acute epididymitis tested positive for *N. gonorrhoeae* and/or *C. trachomatis*.³⁶ Furthermore, men with swollen scrotum often have also signs of urethritis and, as a study in Malawi showed, 1.8 percent of men with urethral symptoms have scrotal swelling.²

A syndromic STD management of swollen scrotum includes treatment similar to the treatment of urethritis syndrome (Fig. 102-3). However, prior to applying a syndromic approach, a non-infectious origin of the syndrome must be excluded. A traumatic cause can be identified from the patient's medical history. Simple clinical examination does not always ensure a correct diagnosis

since it is sometimes difficult to differentiate between epididymitis and testicular torsion. However, in prepubertal boys, testicular torsion tends to be more common than epididymitis.³⁵

GENITAL ULCERS

Like urethritis, genital ulcers are much more common in developing countries than in industrialized countries. However, considerable regional variation exists. There appears to be a higher prevalence of genital ulcer disease (GUD) in Southern African countries compared to West and Central African countries. In rural Zimbabwe, for instance, 63 percent of the male STD patients presented with genital ulcers.³⁷ In this clinic, genital ulcers were the main reason for consultation. Similarly, in rural Mozambique, genital ulcers were the primary reason for consultation in 38 percent of all STD cases.³⁸ In addition to high levels of GUD in STD patients, patients with a genital ulcer tend to wait a long time before presenting themselves at a health center. Thus, in a study in Rwanda, 36 percent of GUD patients had waited for more than 2 weeks.⁶ Similarly, in South Africa, this proportion corresponds to 35 and 36 percent among men and women, respectively, whereas in Gambia, 52 percent of all patients had waited for over 2 weeks.^{39–41} In many cases, patients continued to have sex before consultation.

Table 102-2 illustrates the different etiologies of GUD in different geographical areas. Although their relative distribution may differ within countries, the most common causes of genital ulcers in virtually all developing countries are *Haemophilus ducreyi* (chancroid), syphilis, and genital herpes. It should be noted that the proportion of syphilis shown in the table is probably an overestimate of current infection as the diagnosis of syphilis in the selected studies is based on a positive serology (RPR and TPHA). In studies conducted after 1985, the proportion of GUD accounted for by herpes simplex virus appears to be higher than in earlier studies. It is not known to what extent the AIDS epidemic has played a role in this phenomenon. In Rwanda, for instance, a study in one health center showed that in 1986, herpes simplex virus was the third and second most important cause of genital ulcers in men and women, respectively.⁴⁶ By 1992, herpes simplex virus had become the second cause of genital ulcers in men and the leading cause in female patients.⁶ During that same period, HIV prevalence among patients with genital ulcers increased from 43 to 67 percent in men, and from 77 to 83 percent in women.^{6,46}

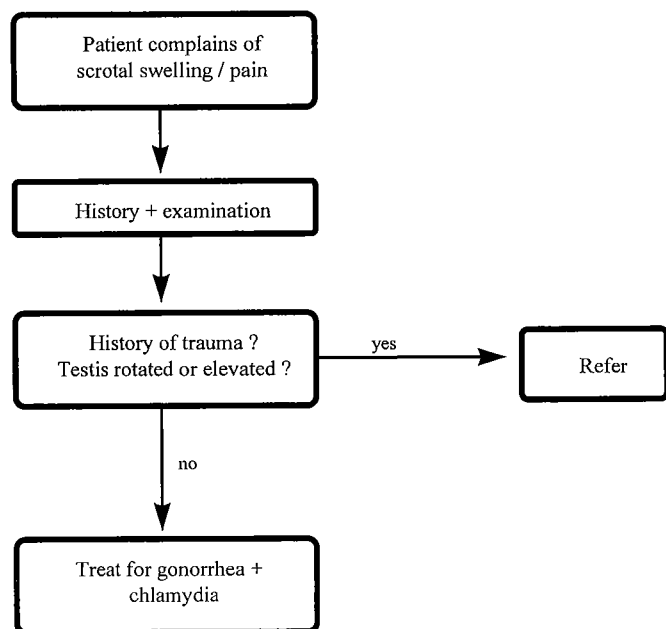


Fig. 102-3. Example of a flowchart for the management of scrotal swelling.

Table 102-2. Etiology of GUD in Different Countries

Country	<i>H. ducreyi</i> (culture +), %	Syphilis (darkfield or serology +), %	<i>H. ducreyi</i> and syphilis, %	Genital herpes (culture HSV +), %	No. etiology identified, %
Rwanda (<i>n</i> = 95) 1992 ⁶	29	28	7	22	32
South Africa (<i>n</i> = 200) 1989 ¹¹	17	43	5	14	19
Malaysia (<i>n</i> = 249) 1990 ⁴²	9	7	1	19	60
Swaziland (<i>n</i> = 155) 1979 ⁴³	44	19	2	12	15
The Gambia (<i>n</i> = 104) 1986 ⁴¹	52	22	10	6	27
Kenya (<i>n</i> = 120) 1980 ⁴⁴	48	10	?	6	36
Thailand (<i>n</i> = 120) 1982 ⁴⁵	38	4	2	12	50

These data suggest that widespread HIV infection may change etiological patterns of GUD.

Two rather rare causes of GUD are lymphogranuloma venereum (LGV) and donovanosis. In its primary stage, LGV may present as an ulceration. LGV was detected in 6, 7, 14, and 0 percent of patients with a genital ulcer, in South Africa, Gambia, Rwanda, and Kenya, respectively.^{11,41,46,44} Donovanosis as a cause of genital ulceration is limited to certain regions, such as Papua New Guinea. Because the disease is extremely rare in most parts of the world, and often is not associated with genital ulcer disease, donovanosis is not considered in most flowcharts. The role of sexual transmission of this disease is still controversial.

In most developing countries, a syndromic approach to the genital ulcer syndrome includes treatment for syphilis and chancroid, but not for herpes, as antiherpetic chemotherapy is rarely available in developing countries (Fig. 102-4).

Determining the underlying causes of GUD is extremely difficult. Clinical diagnosis is unreliable.^{6,11,12} For example, typical vesicles were seen or reported in only 4 percent of confirmed cases in Rwanda.⁶ Adding a rapid plasma reagin (RPR) test for syphilis to a diagnostic flowchart may be considered if the results of the test are readily available. However, the test cannot exclude chancroid as a possible cause of GUD. Therefore, patients with a reactive RPR test should be treated for syphilis as well as chancroid. An additional difficulty is that the RPR test is negative in 30 to 50 percent of patients with a primary syphilitic ulcer.⁴⁷ However,

in developing countries, where patients may wait longer before seeking care, the test is probably more sensitive at presentation. In Rwanda, for example, only one patient seroconverted during follow-up, the other 109 syphilis patients were positive at the first visit.⁶

Because of the high proportion of unidentified etiology, it is difficult to validate a diagnostic approach for genital ulcers. In Table 102-3, the results of a validation study for genital ulcers in Rwanda are presented. Three approaches for the diagnosis of syphilis or chancroid were compared: a syndromic approach, a clinical diagnosis, and a diagnosis based on the RPR test result.⁶ The proportion of correctly managed patients amounted to 99 percent with the syndromic approach, 82 percent with the laboratory approach, and 38 percent with the clinical diagnosis.

In many parts of the world, patients with syphilis often are coinfecting with HIV. Whereas standard treatment of early syphilis and early latent syphilis in patients with HIV infection may be less effective, a few studies did not find a different clinical or serologic response after one dose of benzathine penicillin in HIV-positive as compared to HIV-negative patients.^{48,49}

Antimicrobial resistance of *H. ducreyi* is another recently observed problem. In one study in Kenya, failure of a single intramuscular injection of 250 mg of ceftriaxone was strongly associated with HIV infection.⁵⁰ Increasing resistance to trimethoprim/sulfamethoxazole (TMP/SMZ) and treatment failure have also been documented in Rwanda, but HIV infection and the degree of CD4+ cell depletion were unrelated to clinical and bacteriologic outcomes.¹⁰ Because of such emerging antimicrobial resistance, treatment of chancroid ideally should be based on local antimicrobial susceptibility data.

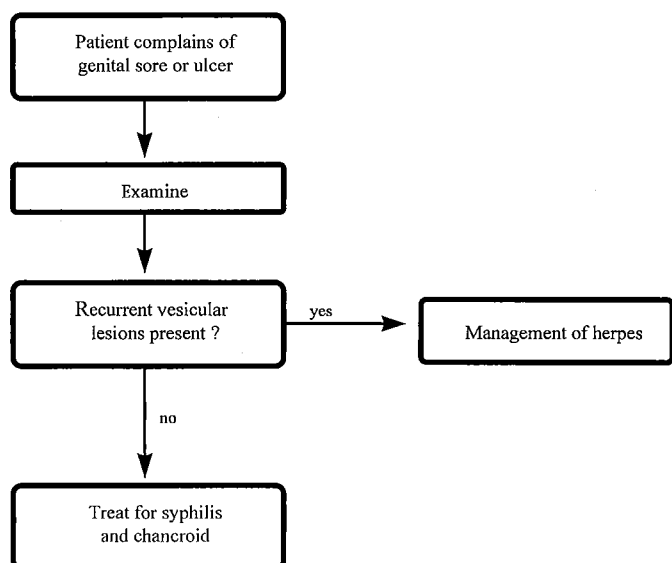


Fig. 102-4. Example of a flowchart for the management of genital ulcers in developing countries.

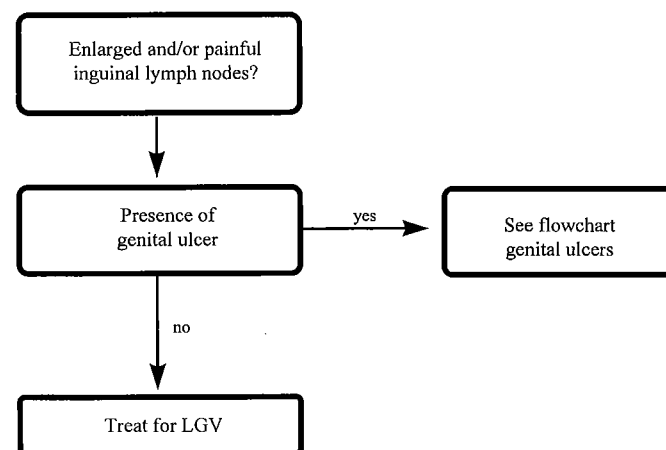


Fig. 102-5. Example of a flowchart for the management of inguinal lymphadenopathy.

Table 102-3. Number of Patients with Chancroid and/or Syphilis Correctly Managed When Applying Three Different Diagnostic Strategies in Rwanda

	Confirmed syphilis	Confirmed chancroid	Confirmed syphilis and chancroid	Total
<i>Number of GUD patients</i>	81	86	29	196
Number of these patients correctly managed (%)				
Syndromic approach*	79 (97.5)	86 (100)	29 (100)	194 (99.0)
Diagnosis based on RPR test results†	78 (96.3)	83 (96.5)	0 (0)	161 (82.1)
Clinical diagnosis	18 (22.2)	57 (66.3)	0 (0)	75 (38.3)
Mixed approach: clinical diagnosis + syndromic approach§	41 (50.6)	69 (80.2)	5 (17.2)	115 (58.7)

* See Fig. 102-4.

† Patients with RPR+ received treatment for syphilis, patients with RPR- received treatment for chancroid.

§ Patients with clear-cut clinical diagnosis were treated accordingly. Patients with undetermined clinical diagnosis received syndromic treatment for chancroid and syphilis.

INGUINAL LYMPHADENOPATHY

STDs are important causes of inguinal lymphadenopathy in developing countries. For example, 8.5 percent of male and 4.7 percent of female STD patients in Kenya were complaining of genital or inguinal swelling.³

Lymph nodes that are 2 cm or larger, and become fluctuant, are considered buboes. The main causes of buboes are chancroid and lymphogranuloma venereum (LGV). In Zimbabwe, 20 percent of men and 6 percent of women with genital ulcers presented with buboes.³⁷ In Rwanda, these proportions were, respectively, 12.4 and 4 percent.⁶

LGV is usually seen in a secondary stage of acute lymphadenitis with bubo formation, without a sign of the primary ulcer.

As proposed in the diagnostic flowchart shown in Fig. 102-5, a practical way to manage buboes is to consider them as LGV when

no ulcer is visible, and to manage them as a genital ulcer syndrome when an ulcer is present. Aspiration of the bubo (through the healthy skin) may be required.

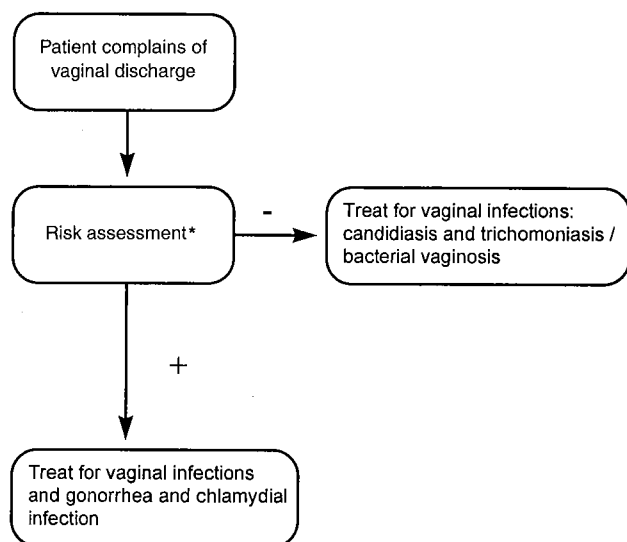
VAGINAL DISCHARGE

Abnormal vaginal discharge is a very common complaint among women, in both developing and industrialized countries.^{3,37,51} It is the main symptom of both cervicitis and vaginitis. The underlying causes of cervicitis in women are gonococcal or chlamydial infection, which are usually localized in the endocervix and urethra. If cervicitis remains untreated, it may cause serious complications such as acute pelvic inflammatory disease, ectopic pregnancy, and infertility.⁵² The failure of many infected women, including those who are symptomatic, to seek medical care, may explain the high prevalence of gonococcal and chlamydial infections, and particularly of their complications in some developing countries. For example, among pregnant women in a rural area in Mozambique, 7 percent had gonorrhea and 8 percent had chlamydial infection.³⁸

The most frequent causes of vaginal infection are candidiasis, bacterial vaginosis, and trichomoniasis. The possible complications of vaginal infection are much more limited except for a potential, but not proven, role in facilitating acquisition of HIV, as well as a role in causing premature birth. As they are a very common reason why women consult health services, the quality of care for vaginal discharge may have a great impact on the confidence that women have in the health service.

In three surveys among women presenting with vaginal discharge at an STD clinic (in Jamaica) or at a primary health care center (in Tanzania and Zimbabwe), the most common causes of their complaints were related to vaginitis (Table 102-4). Nevertheless, a syndromic approach to vaginal discharge should also take cervicitis into account, because of the public health importance of gonococcal or chlamydial infections.

Designing a flowchart that addresses the problem of cervicitis adequately is difficult because of the poor validity of symptoms and clinical signs. None of the symptoms (vaginal discharge, lower abdominal pain, or dysuria) or clinical signs (vaginal discharge, cervical mucopus, friability, or pain on mobilization of the cervix) is both sufficiently sensitive and specific for cervicitis. Asymptomatic gonococcal and chlamydial infections are very common. Thus, in a rural area in Mozambique, up to 89 percent of infected pregnant women did not report any symptoms, and among prostitutes in Zaire, newly acquired infections remained asymptomatic in 69 percent of all cases.^{38,55} However, even in symptomatic women, the predictive value of symptoms and signs for cervicitis remains low. For example, in a study among symptomatic women



*Risk assessment + if symptomatic partner or any two of: age <21, single, >1 partner, new partner in past 3 months.

Fig. 102-6. Example of a flowchart for the management of vaginal discharge.

Table 102-4. Etiology of Vaginal Discharge Complaints in Different Clinical Settings in Developing Countries

Country (ref)	Total number of women with vaginal discharge	Vaginitis			Cervicitis	
		Candidiasis, %	Bacterial vaginosis, %	Trichomoniasis, %	Gonorrhea, %	Chlamydial infection, %
Jamaica ⁵³	609	35	41	25	17	25
Tanzania ⁵⁴	395	38	NA	25	12*	
Zimbabwe ³⁷	65	42	15	39	17	15

* Gonorrhea and/or chlamydial infection, %.

NA: Not available.

in Jamaica, the symptom of vaginal discharge was 83 percent sensitive but only 19 percent specific for cervicitis.⁵³

Several studies have demonstrated that risk markers are more predictive for gonococcal or chlamydial cervicitis than signs and symptoms (Fig. 102-6).^{53,56} This management strategy ensures that a woman with a complaint of vaginal discharge will systematically be treated for vaginitis, but her risk for cervicitis will also be assessed. When her risk assessment is positive, she should receive additional treatment for both gonococcal and chlamydial infection. Risk markers such as a symptomatic partner, being younger than 21 years of age, being single, having more than one or having a new sexual partner in the last 3 months have been successfully validated and the feasibility of asking these questions has been tested in some settings, including Jamaica and rural Tanzania.^{53,54} In other cultures, especially in parts of Asia and Latin America, the acceptability and feasibility of asking such questions may prove more difficult.

Moreover, simple laboratory tests, such as Gram stain or a leukoesterase test, which are useful in detecting urethritis in men, are not specific and sensitive enough to detect cervical infections.^{56,57}

The recommended treatment for vaginitis is shown in Fig. 102-6. It includes treatment for both candidiasis and trichomoniasis, which also covers bacterial vaginosis. Cervicitis should be treated with antibiotics for gonorrhea and chlamydia infection.

LOWER ABDOMINAL PAIN

Pelvic inflammatory disease (PID) is a common complication of untreated cervicitis, *N. gonorrhoea* and *C. trachomatis* are its main causes as was shown from different studies in Africa, whereas data from most other continents are lacking.^{58,59}

The most common symptom of PID is lower abdominal pain that may or may not be accompanied by signs such as fever, cervical motion tenderness, palpable mass, and vaginal discharge.^{58,60} Simple flowcharts for PID or postpartum endometritis have not been evaluated (Fig. 102-7).

Lower abdominal pain in sexually active women can also be a symptom of ectopic pregnancy or of other causes of acute abdomen. These emergencies must be excluded before treating for PID. Recommended treatment regimens and indications for hospitalization are discussed in Chapter 58.

NEONATAL CONJUNCTIVITIS

Both gonococcal and chlamydial ophthalmia neonatorum are still common in many developing countries. Although gonococcal ophthalmia tends to be more severe, more purulent, and with an earlier onset than ophthalmia caused by chlamydial infection, the

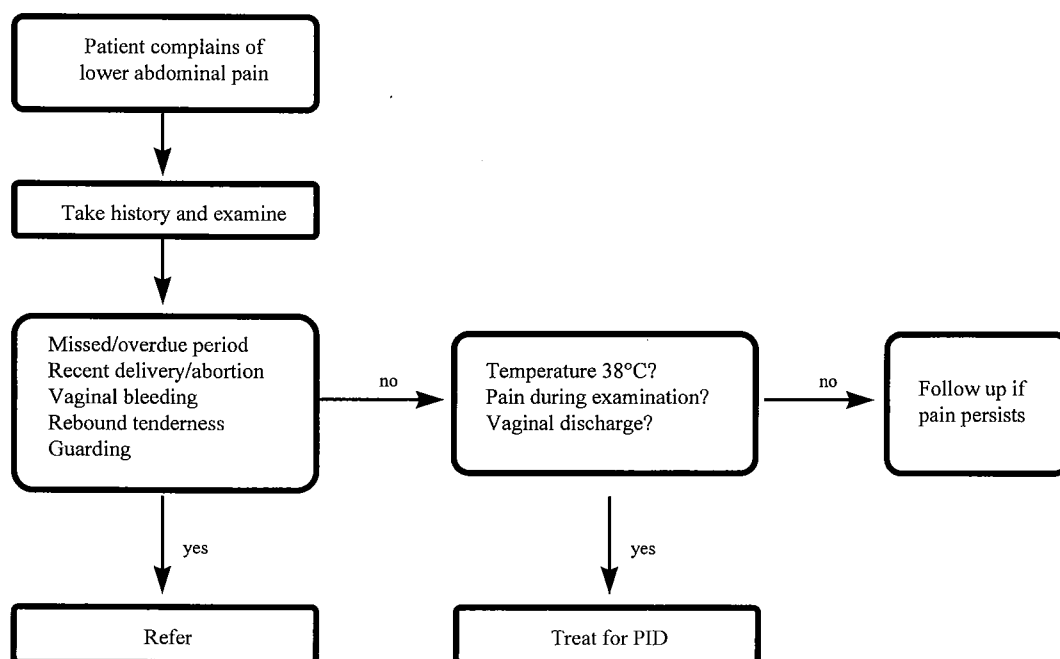


Fig. 102-7. Example of a flowchart for the management of abdominal pain.

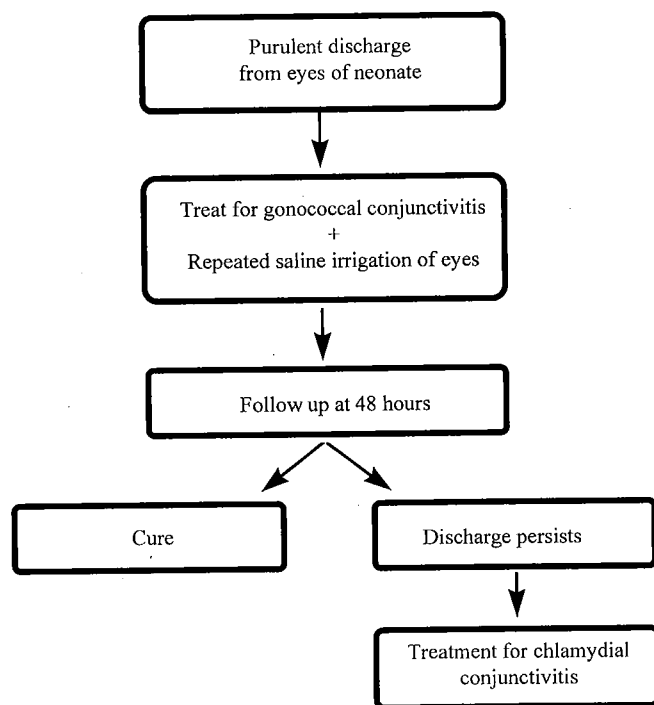


Fig. 102-8. Example of a flowchart for the management of ophthalmia neonatorum.

etiological cause (gonococcal or chlamydial) cannot be assumed on the basis of clinical signs only.

An example of a diagnostic flowchart for ophthalmia neonatorum is provided in Fig. 102-8. The rationale behind the flowchart is that every case of purulent ophthalmia neonatorum should be considered and treated as gonococcal ophthalmia, because this infection may rapidly lead to blindness. Effective treatment dramatically changes the course and outcome of the disease, usually with noticeable improvement within 24 hours. The eyes of the baby should be washed with frequent saline irrigations. Unfortunately, the availability of recommended drugs such as ceftriaxone IM or spectinomycin IM for pediatric preparations is a problem in many developing countries. Kanamycin (25 mg/kg as a single IM dose) can be given as a suboptimal alternative.

Management should also include the treatment of the mother and her partner(s).

CASE FINDING FOR STD IN DEVELOPING COUNTRIES

Because of the asymptomatic nature of many infections, particularly in women, and of the serious complications resulting from untreated infections, active case finding or screening for STD is an obvious public health strategy.

Case finding refers to the detection of infection among individuals consulting for another reason than a STD, for example, for an antenatal visit. Mother and child health clinics and family planning clinics are often women's primary and only contact with the health care system. They are, therefore, ideal places to reach a very high number of sexually active women.

The lack of a simple and valid diagnostic tool is the main technical obstacle for case finding. Furthermore, STD service delivery strategies have to be evaluated for acceptability and feasibility in various populations.

TECHNICAL ASPECTS OF STD CASE FINDING

With the exception of the RPR test (or equivalent) for syphilis screening, no simple, valid, affordable tests are available for detecting STD in asymptomatic patients.

Case finding on the basis of symptoms and clinical signs has proven difficult, because of the very low sensitivity of symptoms and signs for infection. The validity of signs and symptoms for detecting gonococcal and/or chlamydial cervicitis has been summarized in Table 102-5, for two groups of women not spontaneously complaining of STD symptoms. The prevalence of cervicitis varied from 6.5 to 16 percent in pregnant women and from 31 to 45 percent in prostitutes.^{56,61}

The sensitivity of the symptoms of vaginal discharge for gonococcal or chlamydial infection is not higher than 36 and 42 percent, for pregnant women and prostitutes, respectively. Because of these low sensitivities, case finding on the basis of symptoms or clinical signs is not recommended. Moreover, the combination of low prevalence of infection and poor specificity results in a very low positive predictive value.

As was mentioned in the preceding, several studies have demonstrated that risk markers rather than symptoms and signs are predictive for gonococcal or chlamydial cervicitis. However, preliminary evaluations have shown that including risk markers in case-finding strategies do not dramatically improve the positive predictive value.^{54,56}

In conclusion, an acceptable case-finding strategy, without laboratory tests and that combines a high sensitivity with a specificity, is not available. Defining a diagnostic strategy will always be a trade-off between an acceptable sensitivity and specificity, depending on the population for which the strategy is meant. In vulnerable groups with a high prevalence of STDs, such as prostitutes, the sensitivity will be more important than the specificity, in order not to miss infections. In some situations, where prevalences are extremely high, periodic mass treatment could be an

Table 102-5. Sensitivity of Selected Symptoms and Signs for Gonococcal and/or Chlamydial Infection in Pregnant Women and Prostitutes in Africa

Symptom/sign	Sensitivity in pregnant women, percent ^(ref.)	Sensitivity in prostitutes, percent ^(ref.)
<i>Symptoms</i>		
Vaginal discharge	29 ⁶¹ 36 ⁵⁶	27 ⁵⁶ 42 33† 44 ⁵⁶
Lower abdominal pain	39 ⁶¹ 43 ⁵⁶	39† 12† 11 ⁵⁶
Dysuria	7 ⁵⁶ 11 ⁶¹	
<i>Clinical signs</i>		
Vaginal discharge	36 ⁶¹ 67 ⁵⁶	55† 63 ⁵⁶
Cervical mucopus	25 ⁶¹ 1 ⁵⁶	48* 13 ⁵⁶
Cervical friability	7 ⁵⁶ 43 ⁶¹	7 ⁵⁶ 47*
Pain on mobilization of cervix	9 ⁵⁶	10 ⁵⁶ 41†

* Côte d'Ivoire (P Ghys, abstract presented at Xth International Meeting ISSTD, August 1993, Helsinki).

† Benin (M. Alary, abstract presented at IXth International Conference on AIDS and STD, December 1994, Marrakech).

option. One example is São Paulo, Brazil, where as many as 66 percent of the prostitutes were infected with syphilis.⁶² In contrast, in low prevalence groups, such as pregnant women or family planning visitors, specificity and predictive value of the decision to treat will play a major role, in order to avoid the costs of over-treatment and its complications, especially in pregnant women.

In conclusion, a syndromic approach that offers prompt and effective treatment is the preferable option for the management of symptomatic patients. Case-finding strategies for asymptomatic STDs in developing countries, however, are still hindered by the unavailability of a simple and inexpensive test for the diagnosis of gonococcal and chlamydial infection.

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