SEXUALLY TRANSMITTED INFECTIONS

CAH

Sexually Transmitted Infections

Issues in Adolescent Health and Development

Contents

Acknowledgements

Preface

There is widespread acknowledgement that although adolescents share many characteristics with adults, their health-related problems and needs are different in a number of significant respects. Following on from this, there is a growing recognition among clinicians and public-health workers alike that the approaches used to prevent and respond to health problems in adults need to be tailored (to a greater or lesser extent) if they are to meet the special needs of adolescents.

The FCH department of Child and Adolescent Health and Development (CAH) in collaboration with other WHO departments has initiated a series of literature reviews and discussion papers, in order to identify existing recommendations on clinical management, and to assess how appropriate these recommendations are for adolescents across a wide range of health issues. This process has also led to the formulation of new recommendations on clinical management where none existed, or where existing ones were inappropriate.

This same process is also contributing to the improvement of existing WHO guidelines and algorithms and to the development of new ones to enable health-care providers to meet better the special needs of adolescents effectively and with sensitivity.

The current review looks specifically at data that address various aspects of sexually transmitted infections (STIs) in adolescents. STIs – including infection with the human immunodeficiency virus (HIV) – represent a major health risk to all sexually active adolescents.

Carefully planned strategies for the provision of preventive and curative RTI/STI services for adolescents are important because they have the potential to influence behaviour and treatment-seeking practices at the very outset of young people's sexual and reproductive lives. For this reason the main aim of this review paper is to consider some of the issues involved in tailoring clinical management practice to meet the special needs of adolescents.

In addition to the present work, reviews and discussion papers have also been carried out – and corresponding documents produced – in the areas of:

- Contraception
- Lung health
- Malaria
- Nutrition
- Pregnancy
- Unsafe abortion

Work is also under way to develop similar documents on HIV/AIDS care; chronic illness; mental health; and substance abuse.

Abbreviations used

AIDS	Acquired immunodeficiency syndrome
ANC	Antenatal care
BV	Bacterial vaginosis
DNA	Deoxyribonucleic acid
FP	Family planning
HIV	Human immunodeficiency virus
HPV	Human papilloma virus
HSV-2	Herpes simplex virus type 2
MCH	Maternal and child health
PID	Pelvic inflammatory disease
RPR	Rapid plasma reagin
RTI(s)	Reproductive tract infection(s)
STD(s)	Sexually transmitted disease(s)
STI(s)	Sexually transmitted infection(s)
TPHA	Treponema pallidum haemagglutination assay
TV	*Trichomonas vaginalis*
UNAIDS	Joint United Nations Programme on AIDS
VDRL	Venereal Disease Research Laboratory
WHO	World Health Organization

Introduction

In both developed and developing countries, the increasing incidence and prevalence of STI/HIV among adolescents present a serious challenge to their health and well-being (Adler et al., 1996; Friedman et al., 1997). Studies in western countries, for example, have demonstrated that females under the age of 20 are the population group most likely to be infected with *Candida trachomatis* (Brabin, 1996a). Furthermore, although the overall incidence of gonorrhoea has declined markedly in the USA, it is now highest among 10–14 year olds, after adjusting for sexual activity[1] (Wasserheit & Aral, 1996). In some African countries, the HIV epidemic seems to be levelling off and as the disease becomes endemic, peak incidence shifts to younger age cohorts (Stoneburner et al., 1996). The reasons for this focus of infection in young people are complex, but include biological factors, sexual behaviour patterns and networks, epidemiological transmission dynamics and treatment-seeking behaviour[2].

The four most prevalent STIs are trichomoniasis, chlamydial infections, gonorrhoea and syphilis. The majority of these infections occur in developing countries, at a higher prevalence and incidence than in developed countries. These infections are both preventable and curable provided that adequate antibiotic therapy is used and standardized management protocols are available.

The main impetus for treating STIs has been the HIV epidemic, which has affected as many as 25% of sexually active girls in some sub-Saharan African countries (Fylkesnes et al., 1997; Taha et al., 1998). The syndromic treatment of STIs has been associated with a 40% decrease in acquisition of HIV infection at the population level in one research study in Tanzania (Grosskurth et al., 1995). This decrease is considered to be the result of shortening the average duration of infectivity, thus reducing the probability of HIV transmission.

Treatment of non-sexually transmitted reproductive tract infections (RTIs) such as bacterial vaginosis, which are thought to be very prevalent in adolescents, has also been suggested. Here the rationale is that abnormalities in vaginal flora (such as depletion of vaginal lactobacilli) may also increase the risk of acquiring HIV (Sewankambo et al., 1997).

However, even in countries where HIV infection is at low prevalence, STIs/RTIs are associated with other serious sequelae in the non-pregnant and/or pregnant teenager, such as ectopic pregnancy (Meheus et al., 1992); premature rupture of membranes (Eschenbach D, 1993); complications of abortion

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[1]   The denominator for rates of STIs in adolescents should be the number who are sexually experienced. In 1995, only 53% of American high-school students had ever had sex; dividing reported gonorrhoea in 15–19 year olds by the number of sexually experienced adolescents indicates that the latter had a risk of infection that was twice that calculated using standard population denominators (Fox et al., 1998).

[2]   Biological factors – cervical ectopy (normally present in 60–80% of sexually active adolescents) is associated with an increased risk of *C. trachomatis* infection (Stamm and Holmes, 1990).

Sexual behaviour patterns – STI infections in adolescent females have been associated with contact with older partners. In one study in Namibia no STI infections were detected in young sexually active males, which suggested that their sexual partners were young, as yet infection-free, girls (Harms et al., 1998).

Epidemiological transmission dynamics – standard STD epidemiology postulates that all endemic and epidemic transmission of curable STDs is sustained by small subsets of the population; so-called "core groups" (Yorke et al., 1978). High HIV seroprevalence in the USA has been found among imprisoned young females with a history of injecting drug use or prostitution, and among homeless and runaway youths (Lindegren et al., 1994).

Treatment-seeking behaviour – the increase in gonorrhoea rates observed in adolescents in the USA is thought to reflect ineffective health-care contact (Wasserheit & Aral, 1996).

(Blackwell et al., 1993); adverse pregnancy outcome (Hardy et al., 1984); and pelvic infection and infertility (Washington et al., 1985).

The World Health Organization (WHO) has recommended the syndromic management of STI in resource-poor settings where aetiological diagnosis, requiring laboratory facilities and expertise, is not affordable (WHO, 1995). The use of a syndromic approach means that STI treatment can be made available at primary-care level, and more accessible, particularly for women at Maternal and Child Health (MCH)/Family Planning (FP) clinics.

For a variety of reasons, however, current STI diagnosis and management services do not attract a sufficient proportion of adolescents who require care, even in developed countries. A study of the delivery of pre-paid, low-cost preventive services (STI screening and Papanicolaou (Pap) smear testing) to adolescents in Massachusetts, USA found that Pap smears were collected from a group which represented less than half the estimated sexually active age group. Moreover, the level of STI screening covered only 21% of the estimated eligible group of adolescents aged 15–19 years (Thrall et al., 1998). A survey of the provision of sexual health care to adolescents by genitourinary clinics in the UK gives some indication why adolescents may not attend: only 14% provided a full contraceptive service and just 4% held sessions for young people only. None of the clinics were using education approaches regarded as methodologically effective in influencing behaviour change (British Co-operative Clinical Group, 1997).

As stated earlier, carefully planned strategies for the provision of preventive and curative RTI/STI services for adolescents are important because they have the potential to influence behaviour and treatment-seeking practices at the very outset of young people's sexual and reproductive lives.

PART 2
Nature of the problem

In addition to the above factors, there are also clear differences in the epidemiology of STI in adolescents and adults. Although clinical presentations are similar, adolescents are regarded as being more biologically susceptible to infection and at increased risk of morbidity, especially during pregnancy. Some of these differences have been obscured through the common practice of reporting adolescents (10–19 years) in the same category as "youth" (15–24 years) and through general inattention to adolescent females who are married and pregnant.

2.1 Prevalence of infections

HIV infection
Very little age and sex-specific data are available for STIs other than for infection with HIV as obtained from serosentinel surveillance sites and from several community studies. Globally, HIV infection is not evenly distributed and currently sub-Saharan Africa is disproportionately affected. Within the region itself there is also much variation in the stages of the epidemic.

A pattern of relatively high HIV seroprevalence in adolescent females (with peak prevalence among women in their 20s) is seen in data from several countries (Mulder et al., 1995; Fylkesnes et al., 1997; Taha et al., 1998). Incidence is high as the infection enters an initially unexposed adolescent sub-population whose exposure gradually increases as regular sexual activity is established. In the Rakai district of Uganda, HIV infection rates rose from about 5% in adolescents to about 20% at age 20–24 years (Gray et al., 1997). Peak prevalence is seen among those in their 20s because by this age most women will be in regular sexual relationships, and though infections continue to be acquired, incidence rates are lower than in adolescence. Prevalence in adolescent males is lower; for example 0.2% in Uganda (Mulder et al., 1995) and 1.8% in Ethiopia (Fontanet et al., 1998). Most HIV infections in males are probably acquired from late adolescence on.

Sexually transmitted infections
Although comprehensive age and sex-specific data on STIs other than HIV infection are currently lacking, a summary of prevalence data for chlamydia and gonorrhoea in sexually active adolescent females is shown in Figure 1.

Figure 1. Prevalence of chlamydia and gonorrhoea in sexually active females <20 years
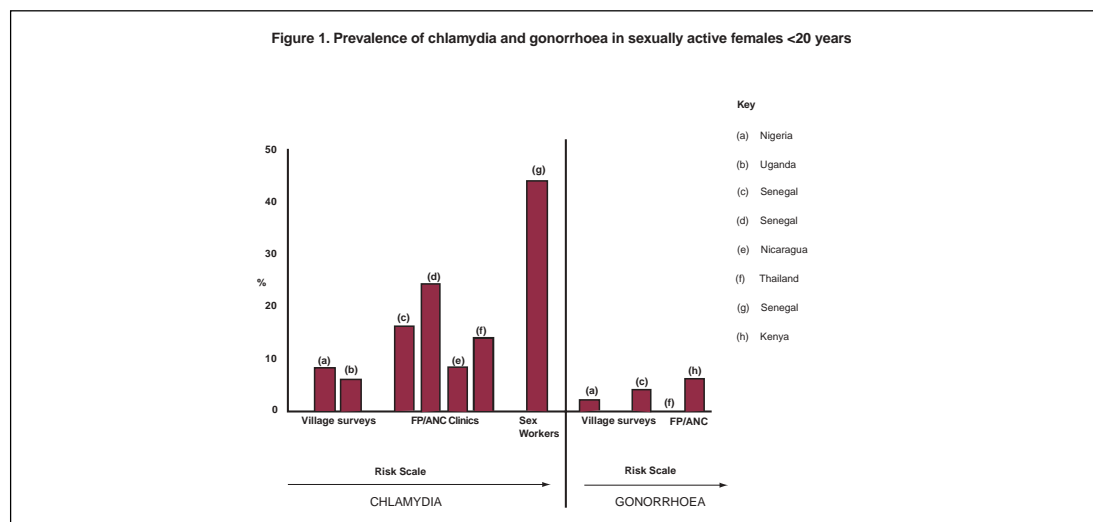
What is also striking is the very limited number of studies which report on chlamydia and gonorrhoea as separate infections in the age group below 20 years. A recent compendium of papers assessing syndromic management in countries in Latin America, Asia, Africa and the Caribbean uniformly presented a combined prevalence figure (presumably for comparability) for "cervical infection" (Mindel et al., 1998). When chlamydia and gonococcal prevalence were separately reported, the data was often not categorized by age – even where the most commonly selected cut-off was below 25 years. The prevalence data in Figure 1 give no global overview, but are highly indicative of what is likely to be the pattern of chlamydia and gonococcal infection in adolescents in many countries. Prevalence is higher in sub-populations who have highly frequent sexual relationships than it is in the general population of sexually active adolescents.

Non-pregnant adolescents

A rural population-based study in south-east Nigeria remains one of the few studies to have reported on several STIs by age from sub-Saharan Africa (Brabin et al., 1995). This cross-sectional study was designed to obtain demographic, clinical and microbiological data on several indicators of reproductive health, including abortion and reproductive tract infections among adolescent girls compared to older women. It aimed to recruit all girls aged 10–19 years who had attained menarche, and succeeded in interviewing and examining 410 (93.4%) of those who were sexually active, as well as a representative sample of older women.

Samples were taken for candida, trichomonas, gonorrhoea, chlamydia and syphilis. However, absolute prevalence rates for infections detected in this study cannot be generalized to other regions of Nigeria or elsewhere, as prevalence reflects sexual activity patterns peculiar to each situation. Nevertheless, the relative importance of different infections in the adolescent age group (reflecting biological, epidemiological and possibly immunological factors) is consistent with a body of evidence from western studies.

Chlamydia and trichomoniasis were the two infections most commonly found. Chlamydia was most often detected in sexually active 17–19 year olds (10.5%) and in line with many studies from developed countries, prevalence declined with increasing age. Without doubt, chlamydia can be characterized as an adolescent infection. Prevalence of trichomonal infections in sexually active females was comparable to that found in older women. Its appearance in young adolescents who had only recently become sexually active suggested it might be a good marker of recent onset of sexual activity.

A second population-based study of adolescent females in urban Port Harcourt in the same country surprisingly found a lower prevalence of STIs than in the rural area (Ikimalo et al., 1999). In both studies, gonorrhoea was only infrequently detected – a finding confirmed by other studies (Quinn et al., 1997; De Schampheleire, 1997). Gonorrhoea is normally seen as a "core group" infection and though it would be expected to be common among adolescent sex workers (or other higher risk sub-groups such as pregnant adolescents) it is less likely to be detected in the general population of adolescents. Diallo et al. (1998) detected gonorrhoea in 31% of female sex workers in Abidjan, whereas chlamydia was found in only 11%. Adolescent sex workers, however, were subject to a 2.5% increased risk of cervical infection.

Genital warts are an easily recognizable condition but only a fraction of HPV infections are clinical (Temmerman et al., 1998). In developed countries, genital warts due to human papilloma virus (HPV) Types 6, 11, 16, 18, 31 and 35, and genital herpes due to herpes simplex virus (HSV) are two of the most common STIs in the adolescent age group (Williams, 1998) although this conclusion is based on cases reported rather than prevalence figures. In the UK there has been an 80% rise in the number of new cases of genital herpes reported over the past 10 years. With 17% of all female primary HSV infections occurring in women below 19 years, this population is potentially at increased risk of HIV infection. Although genital warts were rare in the two Nigerian surveys above (Brabin et al., 1995) there is an overall lack of information on the situation in developing countries regarding these two infections. One study of adolescent college students in Port Harcourt recently reported that clinically diagnosed genital herpes was present in 0.8% and genital warts in 1.7% of females (De la Court et al., 1998).

STIs among pregnant adolescents

In general STIs appear to pose a much greater problem in pregnant adolescents than in older pregnant women who are more sexually experienced and more likely to be involved in a stable monogamous sexual relationship at the time of conception (Brunham et al., 1990). Adolescents have miscarriages more often than do older women – a difference which may be partly attributed to STI. The younger the individual, the greater the likelihood that any given infection is a primary infection, which in non-immune women will cause greater morbidity. Gonorrhoea and syphilis are serious infections of pregnancy, while *C. trachomatis* and HSV-2 are also common but difficult to diagnose.

It is because of their effects on the placenta, fetus, uterus and Fallopian tubes that make infections during pregnancy very serious, particularly in developing countries where a large proportion of females conceive at a very young age. In Malawi, for example, a recent study showed that 52.3% of all nulliparae attending for antenatal care were adolescents (Brabin et al., 1998). Twenty five percent were 16 years or below of whom 4.5% were VDRL-positive and 24.0% were HIV-positive. The problem of STIs in adolescents who continue their pregnancies tends to receive less attention than it does in those adolescents who elect for abortion.

STIs among adolescent males

Data for adolescent males in developing countries is almost non-existent. This reflects the recognition that the burden of morbidity associated with STIs is far higher for females than for males. Several studies of men have however been undertaken in sub-Saharan Africa but the age classes do not separate out adolescents below 20 years of age (Lule et al., 1994; Grosskurth et al., 1996). A study of epidemiological risk factors for STIs in young Thai men aged 19–23 years (conscripted by lottery into the Royal Thai Army and Air Force) indicated that gonorrhoea and chancroid (i.e. core group infections) were the most common STIs (Celentano et al., 1996). These results were not, however, based on laboratory tests – instead, brothel patronage (widespread among young Thai men) was the principle predictor of STIs used in this study population.

2.2 Susceptibility and clinical presentation

At the time of puberty and adolescence, the female genital tract enlarges in response to increasing levels of ovarian hormones, and a number of anatomical and histological changes take place. The vaginal epithelium begins to secrete mucus and the pH of the vaginal milieu is reduced. Both of these mechanisms increase the resistance of the vagina to infection. The secretion of mucus causes the adolescent girl to develop a white vaginal discharge which is physiological (Garden, 1998). In early puberty, oestrogen produced by the ovaries leads to a rising or continuing oestrogenic stimulus, and the endometrium thickens and menstruation begins, though it may be several years before ovulation becomes regular. The columnar epithelium extends from the endo-cervical canal onto the porto-vaginalis of the cervix in early puberty.

During this early phase, exposure to oncogenic pathogens such as human papilloma virus (HPV) enhances the risk of dyskaryosis and carcinoma. Because *Neisseria gonorrhoeae*, for example, can infect the columnar epithelium, the immature cervix can be readily colonized. Cervical mucus production and humoral immunity are absent until ovulation begins, hence the higher risks of complications in the immature adolescent exposed to infection. In particular, the defence mechanisms against ascending infections and subsequent pelvic inflammatory disease (PID) provided by the cervix in physically mature women are less developed in adolescent females.

Clinical presentation

In the majority of cases, the clinical presentation of an STI in adolescents is similar to that seen in adults (Williams, 1998) and includes:

Cervical infections – In the female 85% of gonococcal infections will be asymptomatic but vulvar itching, a minor discharge, urethritis and proctitis may appear after a period of 2–5 days. In pre-pubescent girls,

a purulent vulvo vaginitis may occur. Similarly, *Chlamydia trachomatis* is asymptomatic in the majority of cases. Symptoms which may occur in the adolescent are inter-menstrual bleeding, post-coital bleeding and, occasionally, an increase in vaginal secretions. However, vaginal discharge is a very poor predictor of the presence of chlamydial infection. For this reason, in developed countries, screening of all sexually active adolescents is recommended, especially in girls seeking contraceptive advice, during pregnancy, or requesting termination of pregnancy (Mårdh & Domeika, 1996).

Genital ulcer disease – Clinical presentation of syphilis is the same in adolescents as in adults. Primary chancre, secondary manifestations of syphilis, latent syphilis or positive syphilis serology are all experienced in much the same manner.

Ano-genital warts – Ano-genital warts present as condylomatous, papular or flat (subclinical) lesions. Clinical appearance is a poor predictor of the HPV-type giving rise to the warts.

Vaginitis – *Trichomonas vaginalis, Candida albicans* and bacterial vaginosis are the three common pathological causes of vaginal discharge. *T. vaginalis* is sexually transmitted and causes an offensive malodorous discharge with vulvar soreness and irritation. It may also present without symptoms. *C.albicans* is uncommon in adolescents prior to puberty. Attacks of candidiasis/vulvitis may be cyclical in nature and correspond to menstruation. In contrast to candidiasis, bacterial vaginosis is not associated with vulvitis, itching or soreness.

PART 3
Factors contributing to the problem of STIs among adolescents

3.1 Adolescent sexual behaviour

Sexually active adolescents place themselves at risk of an STI when they engage in unprotected sex. The context in which adolescents become sexually active very much influences how they deal with sexual relationships, the extent to which they are able to protect themselves and how they perceive the unwanted outcomes of sex.

The health of the poor is generally worse than the health of the non-poor regardless of age (Klerman, 1992), and poverty does impact on adolescent health. Poor adolescents are likely to live in environments that do not support health-promoting activities. It is not only specific behaviours that place adolescents at risk, but also the fact that the environment in which they find themselves often precludes them from the information, motivation, skills and funds required to make healthy choices. The disadvantages of poverty are also overlaid by disparities arising from age, culture, law and gender.

Clinical studies of STI rarely deal with such broader underlying issues. Most try rather to identify more proximate behavioural risk markers, several of which are consistently associated with increased risk of infection, even though they have rather low sensitivity and specificity for screening or case management (De Schampheleire, 1997). This is because adolescent sexual behaviour does not always follow predictable patterns as illustrated by the following findings:

- A detailed study of the sexual and contraceptive lifestyles of young women in **England** found a diverse pattern in terms of age of first intercourse, number of sexual partners and attitudes to the timing of sexual intercourse within relationships (Ford, 1992). Adolescents do not form a discrete sub-population with uniform risk factors even in poor environments.
- Many adolescents are not sexually experienced until late adolescence or before marriage. Some may be sexually experienced but with no recent or regular partner (Aral & Cates, 1989). One Swedish study designed to investigate whether the sexual behaviour of young people could be used to predict the spread of STIs found that the "population at risk" was much smaller than the total sexually active population (Giesecke et al., 1992). Fifty to 75% of the population did not contribute to the spread of STIs because they had none or only one partner during the year.
- Studies in the USA and UK indicate that adolescent females who initiate sexual relations at a very young age (10–14 years) are more likely to engage in sex with high-risk partners (bisexuals, intravenous drug users and HIV-positive men); to take multiple sexual partners; and to report an STI (Greenberg et al., 1992). They are also more likely to have been sexually abused or to have engaged in sex reluctantly (Dickson et al., 1998). Studies in other countries confirm the association between early age at first intercourse and risk of cervical cancer (**Kenya**: Williams et al., 1994; **Korea**: Yoo et al., 1997; **India**: Biswas et al., 1997).
- Markos et al. (1992) reviewed the factors leading to adolescent prostitution in the USA and indicated that the majority of adolescent prostitutes were runaways. A similar observation was made by Duncan et al. (1990) in Ethiopia. The earlier the age of marriage and the shorter the duration, the greater the likelihood of divorce and remarriage, or drift into prostitution. Young people living on the streets in Brazil are considered to be at high risk of HIV/STI because of very early initiation of sex (mean of 11.2 years), which is frequently the result of coercion, particularly of girls (Raffaelli et al., 1993). In south-east Asian countries, however, rural poverty and an organized sex industry may be more important factors in entrapping young females.

- Several studies in South Africa are now drawing attention to physical and sexual abuse of females (Onya et al., 1998; Larsen et al., 1998). In one hospital-based study of child abuse in Kwa-Zulu Natal 65.9% of the children (including young adolescents) had one or more STIs (Larsen et al., 1998). The majority of the cases were females and abuse was attributed to a serious breakdown of family structure due to the effect of the migratory labour system and rapid urbanization.
- In some countries, young adolescent males are encouraged to obtain sexual experience with sex workers. Sixteen percent of young men reported such contact in one ***Zimbabwean*** study (Wilson et al., 1989). Overall, subsets of adolescents appear to account for a large proportion of morbidity.

Furthermore, sexual activity patterns vary greatly in accordance with religion, culture or ethnic group. Information from demographic and health surveys (DHS) in sub-Saharan Africa (from 1986–89) on the proportion of women experiencing first intercourse (or "married") before age 20 revealed marked differences between Botswana, Burundi, Ghana, Kenya, Liberia, Togo and Zimbabwe (Gage & Meekers, 1992). Similar variations can be seen in other countries and regions, such as Latin America (Morris, 1994). The Mexico City Household Survey of Young Adolescent Reproductive Health (US Department of Health and Human Services, 1994) showed, for example, that very few 15–19 year-olds have ever been married or been in a consensual union (12.5% of females and 4.4% of males). Of those never married, 7.2% of females and 41.2% of males said they were sexually experienced. This contrasts with a similar survey in Jamaica where reported sexual experience rose from 35.5% at age 15 years to 87.8% at age 19 years for females, and from 42.7% to 95.3% for corresponding ages in males (National Family Planning Board, 1998). Virtually all Jamaican adolescents surveyed registered their first sexual experience as being outside of legal marriage.

Several African studies indicate that risk of STI/HIV is increased when the sexual partner is older (Brabin, unpublished data). Figures 2 and 3 show diagrammatically how younger girls in Uganda and Ethiopia seem to be infected by older males. However, with increasing age the sexual networks of the girls tend to be centred more within their own age group and, thus, the direction of infection reverses. The mortality effect reduces prevalence in older females at the other end of the age scale.

A more sexually experienced partner may also expose an individual to a wider spectrum of infection, particularly gonorrhoea, trichomoniasis, genital ulcer disease and HIV. Adolescent females may encourage relationships with older partners, not only out of economic necessity, but also for obtaining simple luxuries such as cosmetics and similar gifts. One study by Amazigo et al. (1997) in Nigeria reports female students taking older male partners "to buy make-up" and "to fashion up and show off". Similarly, peer partners were characterized as being "for life" and older partners "for money". Adolescent females who initiate sex at a young age are more likely to take an older partner. In countries where AIDS is not often seen, there may be less motivation for older men to seek out young females as partners, although in South Asia, in traditional and in less-educated communities, it is not uncommon for men to marry women who are younger by over 5 years. What the HIV risk is to males who take older female partners is unknown, although it is reported from Mexico, Guatemala and Jamaica that the majority of first sexual relationships of young males are with older women (US Department of Health and Human Services, 1994; Asociación Guatemalteca de Educación Sexual 1987; Chevannes, 1985).

3.2 Treatment-seeking behaviour

There are very particular reasons why adolescents (especially females) who think they may have an STI either delay or do not seek treatment. Apart from the fact that girls may be far more concerned about pregnancy or menstrual problems than STIs, the fear of disapproval of their sexual behaviour by unsympathetic health-care providers is one of several major obstacles. Other reasons for not attending for STI treatment include:
- ***Lack of confidentiality*** – Confidentiality is one of the most important concerns of adolescents (AMA, 1993) and this applies to school health clinics as well as other public-sector services (Ferguson, 1998). In the USA some schools provide comprehensive student services, but one survey indicated that 58% of pupils had health concerns that they wished to keep private from

Figure 2: Model showing the main direction of HIV infection beween partners of different ages – Uganda

Age (years)

	13—19	20—24	25—34
		Males	
HIV Seroprevalence (%)	0.2	11.8	13.5

Mortality Effect

		Females	
HIV Seroprevalence (%)	4.5	21.3	13.3
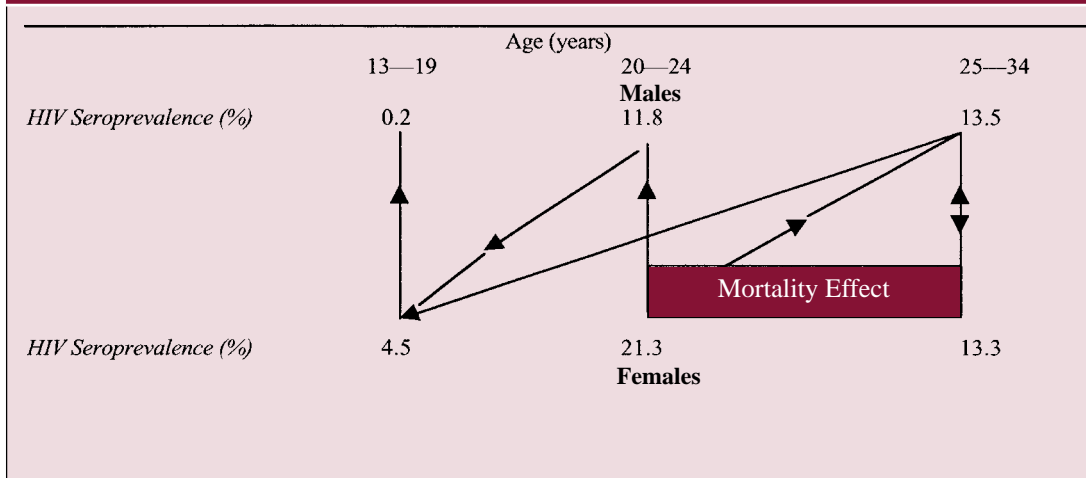
Figure 3: Model showing the main direction of HIV infection beween partners of different ages – Ethiopia

Age (years)

	15—19	20—24	25—29	30—34
			Males	
HIV Seroprev. (%)	1.8	4.5	16.3	11.1

Mortality Effect

			Females	
HIV Seroprev. (%)	3.5	9.1	11.8	7.5
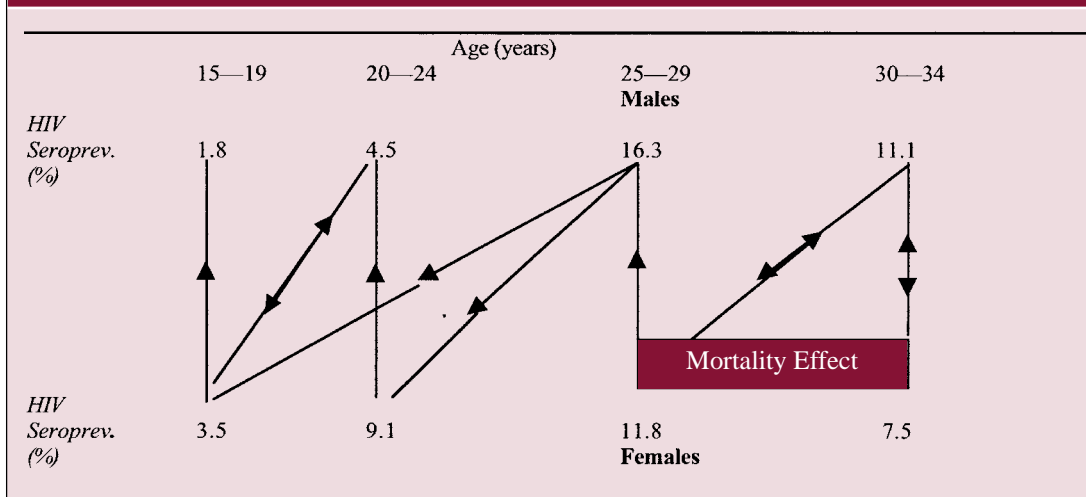
their parents (and 69% from classmates) and that this deterred them from using the clinics (Cheng et al., 1993).

- *Financial limitations* – Although adolescents may feel more comfortable seeking care in the private sector, this is only possible for those who can afford private services. In developing countries many females do not seek treatment at all, and one rural survey in Nigeria (Brabin et al., 1995) showed that only 2.8% of girls with symptoms had sought treatment of any kind (including traditional medicine). Among urban girls the proportion seeking treatment was higher, but an age difference was noted. Only 1.9% of younger symptomatic girls sought treatment compared to 9.5% of older girls. The most likely source of treatment was patent medicine sellers who offer adolescents of both sexes an apparently cheaper and anonymous service. Unfortunately, apart from the fact that the drugs received from such sources may be unsuitable, clients do not receive preventive education, and their sexual partners are not treated.
- *Lack of adolescent-friendly services* – the provision of services where adolescents feel welcome is essential (see Annex I). However, those young people who do attend may not represent those most at risk of having an STI. In Nigeria, urban girls not attending school were contacted in the community and asked to attend a local health centre where specially trained staff, videos and other materials on sexual health were available. Only 40% could be persuaded to attend, and one

deterring factor may have been the need for a pelvic examination, which girls in many cultures dislike (Donovan, 1994).

- ***Ignorance*** – Adolescent females are poorly informed about STIs and have difficulty recognizing their symptoms. In particular, females do not easily distinguish normal from abnormal discharge (Brabin et al., 1995). For some, symptoms cause only a minor irritation, and even when symptoms are clearly present there are often delays in seeking treatment. Such delays are likely to result in an increase in the risk of complications (Aral, 1996). Adolescent females reportedly spend longer than adults appraising their symptoms before seeking help. Feelings of embarrassment and guilt will be powerful deterrents. In one American study comparing adolescents to young adult women with a clinical diagnosis of PID, adolescents sought care later in the course of their illness (mean delay 7.8 vs 5.6 days: Fortenberry, 1997). A high proportion of American adolescents with PID end up in Emergency Rooms (Aral, 1996).
- ***Concerns about possible pregnancy*** – Pregnant adolescents are regarded as a difficult group to reach for antenatal care services; and more difficult than adults (Cheesbrough, 1998). However, in countries where marriage and pregnancy frequently occur in the teenage years, this does not necessarily apply. The decision to seek care for pregnancy is influenced by many factors other than access, including perception of personal health risk, educational attainment, socioeconomic status and personality traits. In many developing countries, routine screening for syphilis is undertaken during pregnancy but girls who do not attend (or who attend very late in pregnancy) miss out.

3.3   Limited success of preventive strategies

Numerous studies have documented that adolescents have inadequate and inaccurate information about STI; that their main source of knowledge is peers; and that an awareness of information does not necessarily lead to its application to safer sex practices (Lema, 1990; Mafany et al., 1990; Odujinrin & Akinkuade, 1991; Lema & Hassan, 1994). Unmarried adolescents who choose to be sexually active must protect themselves by using barrier methods, but access to condoms remains limited and consistency of use is low. Male attitudes to condom use are changing, but this is occurring slowly and the female condom is currently too expensive for most developing-country women (WHO, 1997a). Topical microbicides are currently not suitable for adolescents for biological, cognitive, decision-making, psychosexual and sociocultural reasons (Rosenthal et al., 1998).

Sex education

Adolescence covers a range of developmental states usually differentiate between early (11–14 years), middle (15–18 years) and late (18–21 years) adolescence (Jaccard, 1996). In general, characterizations of adolescent development cover five broad areas: physical, cognitive, emotional, moral and social development. The stage of development influences the kinds of information, motivational messages and persuasive arguments to which the adolescent is receptive. For example, it has been shown that young people who have not yet reached puberty are less ready to talk about sex as a personal matter, although they will discuss sexually related issues such as STIs and pregnancy in general terms (Schuster et al., 1996). During early adolescence most are undergoing their most dramatic physical changes, which are accompanied by heightened sensitivity to appearance. In terms of cognitive development, early adolescents tend to have difficulty in thinking abstractly, and in seeing another person's point of view. Older adolescents exhibit more efficient strategies for storing and retrieving information. In terms of moral development, early adolescents are more likely to blame behavioural transgressions on extenuating circumstances and are less likely to accept responsibility for their own actions (Jaccard, 1996). These developments do not necessarily progress in parallel. The implications for sex-education programmes are that a staged and flexible programme is ideal and in developed countries, school programmes can achieve this. This is far more problematic in developing countries where school attendance (especially among girls) drops rapidly after primary level, and sex education (other than reproductive physiology) may not be incorporated within the school curriculum.

In many countries there is also parental opposition to the provision of sex education. Fears that children will be encouraged to be promiscuous, and preferences for abstinence messages, are strong (Wellings et al., 1995). These concerns run counter to recommendations that adolescents be provided with information, not only on delaying the start of sexual activity, but also on contraception, STIs and how to access services (UNAIDS, 1997).

Since many young people leave school at an early age, there is also a need for the promotion of out-of-school services, offering opportunities for education, counselling and service referral at places of work, in youth clubs and in places where unemployed young people congregate (WHO, 1986).

Barrier protection

One of the main issues with regard to condoms is consistent use. One study in the USA found that even though young women below 25 years were more willing than older women to use barrier methods, the protective effect of this was not always observed (Joo Park et al., 1995). After controlling for the effects of age, race, income and numbers of partners the main reasons cited for the inappropriate and inconsistent use of such methods were: disagreement with the sexual partner; fear of reducing sexual pleasure; and sex with a steady partner. In-school surveys conducted by the Centers for Disease Control and Prevention found that condom use ranged from 27.6% to 59.6% in different states (Orr et al., 1996). The most common reasons given by females for not using condoms with their most recent partners were: that they were on the pill (42.3%); in a monogamous relationship (25.4%); or did not have any condoms when they had sex (23.1%). Reasons given by males included: their partner being on the pill (31%); not having condoms at the time (31.5%); or condoms not feeling good (23.9%). There was an inverse relationship between consistency of reported use with the latest partner and detection of an STI ($P<0.05$). These and other studies indicate that young people do make assessments about how risky sex with their partner might be. Unfortunately, these are often far from accurate. Helitzer-Allen (1994) in one study in Malawi notes that girls believe they *know* the boys/men with whom they develop their relationships ("my mother knows his mother"). In steady relationships, the prevention of pregnancy is often of greater concern than the risk of contracting an STI, and it is reported that as oral contraception use increases, condom use decreases (Cates, 1993; MMWR, 1995).

PART 4
Consequences

The long-term sequelae of STIs are more common and more serious in young women than in either older women or males. Secondary infertility in older women may be easier to bear if they have surviving children, but infertility in a young woman is a condition bringing lifelong anguish (Sundby et al., 1996). STIs in pregnancy also contribute to substantial maternal and child morbidity.

Failure to recognize and treat gonorrhoea leads to pelvic inflammatory disease (PID) in approximately 15% of infected adolescents, and others will progress to disseminated disease (Williams, 1998). Chlamydial infection may lead to "silent PID", where resultant infertility occurs without any signs or symptoms of PID (Patton et al., 1989). PID results from infection of the uterus, Fallopian tubes, ovaries and the pelvic peritoneum, vascular structures and connective tissue. These uterine adnexa are common sites for primary infection, the usual mode of transmission being ascending infection through the cervix. This might occur, for example, as a result of abortion for which no antibiotic coverage is provided (Penney, 1996). Adolescents with acute PID usually present with lower abdominal pain, malaise, fever, dysuria and vaginal discharge. In developing countries, PID is almost always diagnosed on clinical grounds as chlamydia testing and laparoscopic confirmation are not usually available (Mindel et al., 1998). PID is regarded as being most common in young women below 25 years of age, and with each episode the risk of infertility increases (Sweet et al., 1981). It may also lead to an ectopic pregnancy from which mortality is highest in adolescents, primarily due to delay in recognition by the client that she may be pregnant, and failure of medical personnel to suspect pregnancy in the young adolescent (Ammerman et al., 1990).

Infections during pregnancy can produce chorioamnionitis, spontaneous abortions or premature birth. Genital infections present at delivery can cause maternal puerperal sepsis as well as neonatal and infant infections (Brunham et al., 1990).

In countries where women are more aware of the link between ano-genital warts and the risk of cancer, problems of discomfort, long-term treatment and anxiety have been known to lead to psychological disorders (Persson et al., 1993). Genital herpes is also associated with a high incidence of psychological problems and girls need counselling about infectiousness to partners and babies. As regards pregnancy, the rate of vertical transmission is around 3% and only occurs in girls who, at the time of delivery, are actually shedding the herpes virus.

No significant gynaecological, menstrual, endocrine or reproductive-health problems (with the possible exception of reduced fertility: Gray et al., 1998) arise in females who are HIV-positive, and there is only anecdotal evidence that menstrual irregularities are increased. It is not clear whether infertility arises from STI damage to tubal structures or if HIV is the direct cause. Pregnancy does not appear to hasten HIV disease progression. Pre-malignant or intraepithelial neoplasia is more common in women with HIV probably because of higher rates of sexually transmitted human papilloma virus infection. However, few women with advanced immunosuppression survive long enough for a strong association with cervical cancer (Korn and Landers, 1995). The course of PID is not greatly worsened by underlying HIV (Gilks et al., 1998).

Summary of existing policies and practices

5.1   Ethical and legal considerations when dealing with adolescents

There are a number of issues relating to consent for procedures, confidentiality, and access to information (along with potential discrimination on the grounds of age and marital status) that may restrict the services accessible to adolescents or unmarried young people. For example, an insistence that contraceptives can only be provided with parental consent conflicts with the adolescent's need for absolute assurance of confidentiality. The Royal College of Obstetricians and Gynaecologists of Great Britain (1991) have stated that "the health professional has a responsibility to help the young person to understand the implications of sexual activity and the value of confiding in his/her parents". However, it is also important to appreciate that the developing sexuality of young people creates a barrier between them and their parents that is part of the process of growing up. A trained responsible outsider may be a more effective source of counselling than parents. The most common reason for adolescents not confiding in their parents is because they assume that parents would be angry or disappointed in them. If young people are not receptive to the suggestion of including parents in discussions, their choice should be respected unconditionally. They are, in their own way, taking adult responsibilities and making adult decisions. If confidentiality is not maintained on less controversial issues, adolescents in general are unlikely to present for STI consultation. Trust in physicians is directly related to the belief that confidentiality will be protected (Schuster et al., 1996).

5.2   Structure of STI-control programmes

In developing countries, clinical care has traditionally been provided at STI clinics principally serving those at high risk, often in urban centres. Such facilities are not favoured by many females, and are not attractive to adolescents. Although STI clinics do provide specialized clinical care, the current strategy is to move away from this approach in an attempt to make STI care more generally accessible, and to provide a service that is not totally dependent upon laboratory tests. While laboratory tests may be feasible at some secondary and tertiary care facilities, in practice many centres do not have resources for reliable testing.

Accordingly, WHO (1995) recommended the use of syndromic management, which enables primary health-care workers to identify and treat the syndrome caused by an STI, using symptoms, signs and risk assessment. A comprehensive WHO training manual was therefore developed and tested which many ministries of health are now modifying to produce country-specific national guidelines. Countries using such guidelines aim to develop an appropriate infrastructure and training programme for the management of STIs.

STI control programmes organized along these lines have a vertical structure even though they are integrated at the primary health care level, and specialized STI clinics are still required for the management of complicated and referred cases. A centralized reference laboratory is also necessary to monitor epidemiological patterns and antibiotic drug sensitivities. Specific strategies must be organized for "core groups" at high risk (such as sex workers, truck drivers and drug users) some of whom will be adolescents.

5.3 STI syndromes and algorithms

In principle the syndromic approach should mean that STI treatment is more accessible to adolescents. Systematic collection of data, by age and sex, on those treated should also provide a means of monitoring the use of services by adolescents. At present seven algorithms have been developed to aid in the management of:

1:   Vaginal discharge
2:   Urethral discharge in men
3:   Genital ulcer disease in men and women
4:   Swollen scrotum
5:   Lower abdominal pain
6:   Inguinal bubo (swelling)
7:   Eye discharge

The four algorithms most likely to be used in reference to adolescents are Vaginal discharge; Urethral discharge; Genital ulcer disease; and Lower abdominal pain. For the purposes of illustration the WHO vaginal discharge algorithm is shown in Figure 4.

In summary, the correct management of STI among adolescents requires several stages, which include selection of the appropriate flowchart; a well-conducted history-taking and clinical examination; diagnosis; correct treatment; appropriate health education; and the counselling and treatment of partners. Each of these stages needs to be appraised for their suitability for adolescents. Currently most non-pregnant adolescents will be treated by a primary health-care worker using the syndromic approach, whether based in a primary health facility, a family planning clinic which has incorporated STI case detection, or an adolescent clinic. Providers are likely to require more specific training for dealing with symptomatic adolescents than that currently provided in existing manuals, and those areas where additional training will be required are dealt with in the following sections.

In principle, syphilis screening for pregnant women should be integrated into antenatal care in all areas where prevalence exceeds about 2.0%, and WHO (1991) has developed guidelines for syphilis screening. Although pregnant adolescents should be screened, in practice many antenatal programmes do not perform well, either for antenatal care or for syphilis treatment. The effects of this on adolescents will be most serious in areas where a high proportion of first pregnancies are among young adolescent females.

Figure 4: Vaginal discharge algorithm
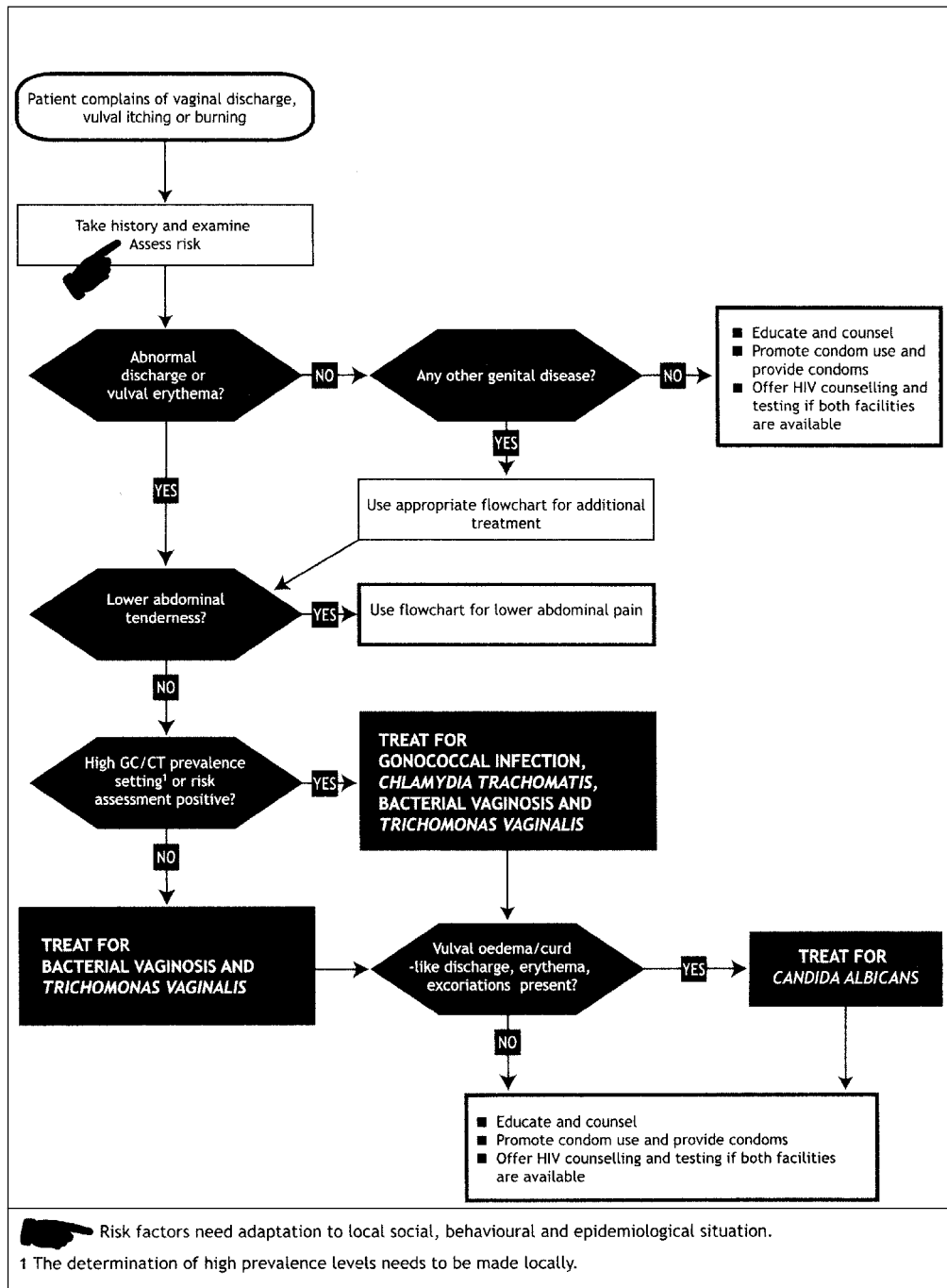
(*Guidelines for the management of sexually transmitted infections*: WHO, 2003)

Tailoring current practices to meet adolescent needs in developing countries

6.1   Introduction

Ensure awareness of care-seeking practices

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Box 1: Factors discouraging adolescents from seeking STI treatment

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Access
*   they do not know about the services available
*   the service may be too far away for adolescents who do not have money for transport or who are expected home at certain times
*   clinics are closed when adolescents leave school/work

Embarrassment
*   adolescents do not like to be treated as children, and MCH/FP clinics often have long queues which deter young people even further (Abdool Karim et al., 1992)
*   they do not want to take the risk of meeting adults they know
*   many will not have acquired the skills needed for expressing a sexual-health problem

Gender
*   adolescent females are concerned about family planning and gynaecological conditions (Evans et al., 1976; Ryan et al., 1996; Williams et al., 1997)
*   adolescent males are attracted to sports venues, and facilities providing condoms (Williams et al., 1997)
*   for both sexes, STI treatment may be a low priority (Glanz et al., 1993)

Facility charges
*   the tests and drugs are often unaffordable for young people (Williams et al., 1997)

Box 1 summarizes some of the reasons why adolescents are thought to be reluctant to attend STI services. Efforts can be made to overcome these factors, for example by:

*   making adolescents aware of treatment facilities through such channels as school health clubs, youth clubs, youth magazines, libraries and churches – they should also know that STIs are easily contracted and need to be treated.
*   putting in place a network of services so that adolescents can be referred on to facilities where STI treatment is available, even if they present for another reason.
*   ensuring that facilities provide adolescent-only sessions; are open at times when young people are free to attend; are close to places of work or study; can easily and cheaply be reached by public transport; and can be accessed at times when adolescents are away from home (e.g., on shopping trips) without creating suspicion (Kishen and Hopwood, 1998).
*   running multipurpose activities such as night-school classes or sports (Brady, 1998). Providers should be aware that different types of services tend to attract different age and sex groups (Townsend et al., 1987). In Nigeria, when Action Health Incorporated opened a small clinic specializing in youth reproductive health, it found that females outnumbered male clients by

two to one. Most clients appeared to be not yet sexually active, and only about one in four visits were related to sexual or reproductive health (Williams et al., 1997).

- providing mobile STI services to reach adolescents at high risk who may be reluctant to present themselves at service sites (Wasserheit and Aral, 1996).

Building competencies
Both providers and managers of health services will benefit from training on adolescent gender issues (PAHO, 1997). It would also be useful for providers and managers to have a good understanding of the realities of the lives of the adolescents they work with or serve (WHO, 1997b). Building on that, it would be useful for them to understand the difficulties adolescents face in obtaining the health services they need.

Establish rapport with the individual
Adolescents are often anxious – particularly about a first visit to a clinic (Jaccard, 1996). Some will have had previous adverse encounters with authority figures, and will expect criticism or punishment. These reservations often translate into non-communicative and even abrasive behaviour (Kishen & Hopwood, 1998). Approaches to overcoming such anxieties include:

- providing the right environment – a bright, attractive room with materials available for perusal, or with videos running, will occupy adolescents while they wait.
- selecting staff carefully for their tolerance and patience – it is also helpful to have both male and female staff, while auxiliary staff (e.g., receptionists) should also be trained to be welcoming and friendly.
- establishing rapport during consultation by providing a private room where conversations cannot be overheard, and where problems can be discussed in an unhurried manner – constant interruptions should be avoided.

Building competencies
Health staff must be able to communicate effectively with their clients and see beyond "surface" actions, and concentrate on the positive aspects of the young person's behaviour.

Elicit information on the health problem facing the adolescent
Adolescents often experience feelings of guilt and shame for contracting an STI. As a result they may not volunteer information about a possible infection, a discharge or a sore. Their symptoms may be vague, especially if unwanted sex (or sexual abuse) is implicated, and their responses may be untruthful. Health-care providers can successfully question adolescents on sexual matters by:

- emphasizing confidentiality – without such reassurance an adolescent may remain reticent.
- maintaining a nonjudgemental approach – at all times the provider must avoid any reaction which suggests disapproval, and the client should be constantly reassured. At times the provider may be suspicious about the truthfulness of the answers given (Shew et al., 1997), but questions can only be pursued to a certain limit, and the adolescent should be encouraged to return for more discussion and assistance.

Health-care providers require from a client the four categories of information summarized in Table 1, namely General details; Present illness; Medical history; and Sexual history. The WHO Syndromic Management Training Manual provides detailed guidance on learning to obtain such information. Questions on sexual history should, ideally, be left until the end to give the provider time to establish a rapport with the young person. This includes questions on marital status, as the provider may be tempted to make a moral judgement and the client may become defensive. A study conducted with family planning and traditional birth attendants in Malawi found that the majority of attendants were older women who regarded adolescents as a mother would, and were reluctant to provide contraceptives to them (STAFH, 1995). The same may well be true of clinic staff – in the same study, 85% of providers asked the client if they were married, and this clearly affected the provider-client relationship.

Building competencies

The WHO Syndromic Management Training Manual can be used for training (with additional guidance) in areas such as:

- dealing with an individual with vaginitis who has been sexually active in the past but does not currently have a partner – the client may still have a non-sexually transmitted infection, and training on this point may help providers overcome their instinctive assumptions about sexual behaviour and its consequences.
- paying particular attention to questions on: abortion history (an adolescent may have an ascending infection as a result of an unsafe abortion); on age of menarche; and on age of first intercourse (very early experience may suggest unwanted or coerced sex).
- developing a clear understanding of risk assessment in adolescents.
- confidentiality/legal requirements which must be specifically addressed in training.

Table 1: Basic information to be elicited from an adolescent client
1: **General details**
❍ Name ❍ Age ❍ Number of children ❍ Address
2: **Present illness**
❍ Presenting complaints and duration ❍ If genital ulcer – *painful; recurrent; spontaneous onset?* ❍ If inguinal bubo – *painful; associated with genital ulcer?* ❍ If genital discharge Males – *dysuria; frequency?* Females – *type of discharge; dysuria; frequency; lower abdominal pain; dyspareunia; dysmenorrhoea; vaginal bleeding; irregular menses; missed or delayed menses; parity; oral contraceptive use?* ❍ Other symptoms
3 **Medical history**
Past STI – *type; treatment and response; results of tests?* ❍ Other illness ❍ Drugs ❍ Drug allergies
4: **Sexual history**
❍ Last sexual intercourse – *date; with whom; use of condom* ❍ Previous sexual intercourse – *date; with whom; use of condom* ❍ New partner in last three months ❍ Partner also has symptoms

Ensure that physical examination is acceptable to adolescents

Consent is required for carrying out a physical examination. Because adolescents dislike being physically examined they could be deterred from attending health facilities if they think that this is a routine procedure – and some will refuse examination when requested. To minimize the discomfort and embarrassment of the examination process a number of good practices should be adopted including:

- When asking for consent an explanation of the necessity of the examination (and of what it entails) is required. It is important to ensure that the adolescent is old enough to give consent without parental permission. Consent to examination normally does not extend to permission to take forensic samples (e.g., in sex abuse cases) or to provide reports to third parties, and in such cases specific informed consent should be obtained.
- It is important to appreciate that all the STI management flowcharts require a physical examination for a diagnosis to be made. Examination is required, for example, to verify the presence of genital ulcers or scrotal swelling, or whenever the individual complains of lower abdominal pain (which might indicate pelvic infection). WHO recommends that, in addition to the history-taking outlined above, a physical examination should be conducted to determine the presence or absence of an abnormal discharge, along with the use of locally adapted risk-assessment criteria.
- If an examination is required, adolescents should be asked if they wish someone trusted to be present (Buchta, 1986).
- People should not be kept waiting for a long time as this increases anxiety.
- Physical examination for males and females must be done in appropriate surroundings. A quiet, comfortable room with good lighting is essential, and gloves must be used for examination. The examination itself may take up to 15 minutes. Providers who carry out the examination should be experienced and understand thoroughly the changes in anatomy and physiology which occur in females at different ages (Robson, 1998).

Building competencies

An outline of the main physical changes which take place in females during adolescence is presented in Box 2. Attention should also be given to the current WHO guidelines on examining male and female adolescents as summarized in Table 2.

Box 2: Female growth and development at puberty

Sequence of events
- a spurt in growth
- early development of secondary sexual characteristics (breast development and pubic hair)
- onset of menstruation
- completion of development of secondary sexual characteristics – growth spurt

This sequence of events has been best described and demonstrated by Marshall and Tanner (1969).

Vaginal development
- begins at about the same time as breast development and final length (about 10 cm) is reached at the time the adolescent reaches final height
- in the pre-pubertal girl, the vaginal epithelium is red and shiny; in the post-pubertal girl mucus secretion begins

Uterine development
- uterine growth starts with the production of oestrogen. It grows longer, and thicker, and changes are complete at about the same time as breast development is complete
- cervical secretion begins

Menstruation
- occurs when a girl has attained Tanner stage 4–5 (see **Annex II**) of breast development

The above events occur under hormonal stimulation (Garden, 1998)

Table 2: Examining adolescent clients

Examining male adolescents

Look for:

1:   Enlarged lymph nodes by palpating:
  –   anterior and posterior triangles of the neck
  –   the submental and suboccipital areas
  –   the axillae and epitrochlear regions.

If enlarged lymph nodes are present, record their size, consistency and number, and also whether they are painful.

It is recommended that both male and female clients be asked to lie down comfortably on a couch for a genital examination. Males should be asked to remove their shirt and expose the area from hip to knees. The client should be covered with a sheet to maintain dignity and respect.

Where a couch is not available a male client may be examined standing up, but this is not ideal. In such a case an explanation should be given. The client should be asked to expose the area from the chest to knees for examination, and the following abnormalities and signs checked for:

2:   Rashes, swellings and ulcers by inspecting the skin of the chest, back, thighs, abdomen, groins and genitals.

3:   Nits and lice on the pubic hair.

4:   Enlarged lymph nodes and buboes in the inguinal region.

5:   Lesions around the anus and perineum while the person is lying comfortably on a couch. The lithotomy position is ideal for both male and female clients when examining the genital area.

6:   Scrotal lesions, by examining:
  –   testis
  –   epididymis
  –   spermatic cord.

7:   Penile lesions, noting any rashes or sores – the foreskin (if present) should then be retracted to expose and examine the:
  –   glans penis
  –   coronal sulcus
  –   frenum
  –   urethral meatus.

If there is no obvious discharge the urethra should be gently milked from the base towards the urethral meatus.

Examining female adolescents

Look for:

1:   Enlarged lymph nodes by palpating:
  –   anterior and posterior triangles of the neck
  –   the submental and suboccipital areas
  –   the axillae and epitrochlear regions.

If these are present, record their size, consistency and number, and also whether they are painful.

Table 2: Examining adolescent clients (contd.)	
	It is recommended that both male and female clients be asked to lie down comfortably on a couch for genital examination. Females should be asked to expose the area from the chest to knees for examination. The client should be covered with a sheet to maintain dignity and respect, and the following abnormalities and signs checked for:
2:	Rashes, swellings and ulcers by inspecting the skin of the chest, back, thighs, abdomen, buttocks, groins and genitals.
3:	Nits and lice on the pubic hair.
4:	Enlarged lymph nodes and buboes in the inguinal region.
5:	Lesions around the vulva, anus and perineum while the client is lying comfortably on the couch. The lithotomy position is ideal for both male and female clients when examining the genital area. The client should be asked to bend and separate her knees for examination of the vulva, anus and perineum.
6:	Pelvic masses and tenderness of the abdomen, taking great care not to hurt the client.

6.2 Diagnosis

The most difficult diagnosis to make using syndromic management is that relating to vaginal discharge. Vaginal discharge is common among both sexually active and non-sexually active adolescent girls. A vaginal discharge is also considered as a normal physiological response during and after sexual activity, at different times in the menstrual cycle, and during pregnancy and lactation. The previous WHO flowchart for vaginal discharge (1995) included a behavioural risk assessment which was meant to identify those whose behaviour places them at greater risk of cervical infections. The flowchart was problematic when applied to adolescents because it classified too many adolescents as high risk. This was because several of the screening questions (shown in Table 3) were bound to be positive in adolescents.

Table 3: Screening questions for cervical infection	
1	Does your partner have a urethral discharge or sores on the penis?
2	Are you less than 21 years of age?
3	Are you single?
4	Do you have more than one partner? (i.e. in the last three months)
5	Have you had a new partner during the last three months?

According to the scoring criteria, if the answer is **Yes** to the first question or to any two of the other four questions, the risk assessment for cervical infection is positive. Clearly, on the basis of criteria 2 and 3, many adolescents would be considered at high risk. This could lead to considerable over-treatment and unnecessary anxiety. One solution would simply be to raise the cut-off score for adolescents. It would, however, be more useful if questions on sexual behaviour were made relevant to local adolescent sexual behaviour patterns.

The current WHO vaginal flowchart algorithm (2001) therefore takes this into account and encourages the use of risk factors adapted to the local social, behavioural and epidemiological situation when assessment is made. For adolescents, risk based on behavioural factors is more appropriate, and in practice

all flowcharts should be adapted to take account of the epidemiological pattern of infections and risk behaviour. Health-care providers should ask more detailed questions about the girl's current sexual relationship, the type of partner with whom she is involved and whether she is moving between partners, before making a decision on whether the girl should be treated for vaginal infection only or for cervical infection as well.

Behavioural adaptations of the WHO syndromic profile have not been extensively tested. In Zambia, however, it has been found that both male and female behaviour predicted STI among married Zambian women (Morrison et al., 1997). For example, a woman's alcohol use before sex and her husband paying for commercial sex were highly associated with gonorrhoea in women. Currently the only algorithm derived from (and for) an adolescent population is from urban Port Harcourt, Nigeria (Obunge et al., 2001). It is based on a population of adolescent females who had a low prevalence of gonorrhoea and chlamydia. A key difference between this and the standard WHO algorithm for vaginal discharge is establishing whether the adolescent is currently sexually active. Girls who are sexually experienced but not sexually active are treated for vaginal infection only. Additional useful factors in this population were found to be the occupation of the partner, and the partner's age being 25 years or older.

Building Competencies

Some behavioural patterns are likely to be associated with increased risk of STI in the setting in which the provider is operating (WHO, 1997b). Among many others are early sexual debut (below 15 years); substance use; lack of condom use; frequent sexual partner change; sexual networking characteristics; and coerced sex.

6.3   Discussing the implications of the diagnosis

Once a diagnosis has been made, there are a number of implications for the patient (whether adolescent or adult). WHO guidelines seek to ensure that, before leaving a clinic, individuals should have a clear understanding of the issues shown in Table 4.

Table 4: Implications of diagnosis	
1	How the infection was contracted
2	How the infection is cured
3	How the infection can be prevented from spreading
4	Why sex partners need to be treated
5	Why a further check-up may be required
6	How to prevent re-infection through safer sex practices

It must be seriously questioned whether the very limited time available to the provider makes it possible to deal adequately with the adolescent patient – especially younger adolescents who have little previous experience of what is required of them following the consultation. In a very short time they are expected to assimilate substantial amounts of new information about infections. They must comprehend that drugs have to be purchased and taken according to instructions; that their partners need to be informed of the infection both because sex cannot continue until the infection is cured, and because the partner needs treatment. They also need to consider how to change their situation in order to reduce the risk of re-infection.

Although the manner in which medical histories are taken is very different to the way in which a counsellor helps clients to explore their own situation (WHO, 1993), a counsellor who is not equipped to diagnose or treat STIs can still effectively counsel a client suffering from an STI. Health-care providers, having explained the diagnosis and treatment, should be able to refer the adolescent to a counsellor for further discussion of their personal situation, if this is considered necessary.

Building competencies

There are counselling skills training programmes available, such as that produced by WHO (1993) and the Central Health Education Bureau, India (1997). Health-care providers may themselves be trained as counsellors – or they should at least appreciate the importance of the availability of counselling (especially for traumatized individuals: Larsen et al., 1998).

6.4   Principles of treatment and follow-up

The antimicrobial resistance of several sexually transmitted pathogens has been increasing in many parts of the world, and this has rendered some low-cost regimens ineffective. Drug regimens therefore need to be based upon local antibiotic resistance patterns. Recommendations to use more effective drugs frequently raise concerns about cost and possible misuse. Adolescents in particular are more likely to find the cost of drugs more prohibitive, and ideally, a single-dose regimen should be selected and administered immediately.

A two-tier drug policy with the provision of less effective drugs at the peripheral health-care level and the most effective (and usually more expensive) drugs only at a referral level may result in an unacceptable rate of treatment failures, complications and referrals. This may then erode confidence in the health services, and this approach is therefore not recommended. Drugs used for STI in all health-care facilities should be at least 95% effective, and should meet the criteria for selection listed in Box 3.

There are no simple solutions for ensuring that adolescents are able to afford STI drugs. One study is currently assessing a strategy to subsidize STI treatments for adolescents through the private sector (Obunge & Brabin, 1998). This approach is only likely to work in areas where there is a high demand for private services by adolescents.

The medical treatment of STI is however only one part of a much broader approach to addressing this issue. One of the most important needs of the adolescent client is follow-up – not just to confirm cure, but to provide ongoing support in dealing with their sexual health needs. Ongoing contact will provide the greatest chance that knowledge and behaviours are positively modified. Young people therefore need to have access to programmes where information, skills-building initiatives and contraceptive supplies (including condoms) are regularly available (Winter & Breckenmaker, 1991).

The kind of sexual-health education required by young people has been described as:

- providing relevant information that does not assume ignorance, but builds upon existing knowledge and experience that is relevant to the young person's stage of development
- developing skills that will enable them to control their lives
- promoting positive attitudes and values about health and quality of life so that young people will make the right choices and develop healthy lifestyles
- promoting self esteem so that young people have a sense of their own worth (Lyons, 1998).

Providing this kind of comprehensive follow-up service in the context of a busy health centre remains a major challenge. In theory, one possible approach is through the provision of a dedicated adolescent service, where the provision of primary and follow-on care is combined, but this has proved impractical in many settings (Box 4). Some schools in the USA have provided reproductive services and sexual-health counselling to secondary school children. This model is however unlikely to work in many developing countries where school health services are weak or non-existent.

Nor are adolescents at high risk likely to present themselves spontaneously at health facilities. Outreach strategies are therefore nearly always required to reach them. This might include, for example, mobile clinical teams working with appropriately trained groups to reach, talk to and followup the most vulnerable adolescents (Wasserheit & Aral, 1996). In such outreach activities so-called "opinion leaders" (those whose sexual behaviour is perceived by young people to be more risky) are far more effective at influencing and shaping the ideas of other young people than even peer educators (Jaccard et al., 1995). Providing continuity of care for groups at high risk is difficult, and individuals need to be encouraged to present themselves for future care at recognized "friendly" facilities. Larsen et al. (1998) have expressed the view that specialized regional centres may also be needed for the referral of sex abuse cases, where counselling and protection can be offered.

Box 3: Criteria for the selection of STI drugs

Drugs selected for treating STI should meet the following criteria:

- high efficacy (at least 95%)
- low cost
- acceptable toxicity and tolerance
- organism resistance unlikely to develop or likely to be delayed
- single dose
- oral administration
- not contraindicated for pregnant or lactating women.

Appropriate drugs should be included in the national Essential Drugs List and in choosing drugs, consideration should be given to the capabilities and experience of health personnel.

(*Guidelines for the management of sexually transmitted infections*: WHO, 2001)

Box 4: Dedicated adolescent services

There are reservations about the establishment of services exclusively dedicated to adolescents because of the high running costs of fixed service sites and the apparent lack of impact in reaching the target group (Senderowitz, 1997). The Mexican Centro de Orientacion para Adolescentes (CORA) in Mexico City, for example, attracted only 16% of its target population. There is virtually no information on how well such centres manage STIs. In Nigeria, over a six-month period in 1997, the Action Health clinic received an average of only nine clients a day. The clinic does not have the equipment needed to screen blood for HIV and was not referring any clients to a hospital or laboratory. The Lobatse Youth Counselling Centre in Botswana attracts predominantly young men and boys. It distributes only one type of contraception (condoms) and is seeking ways to attract young women who are at high risk of teenage pregnancy (Williams et al., 1997).

Another example of a dedicated adolescent centre (Youth PRO-FILE) has been established in Port Harcourt, Nigeria, but it plans to act more as a coordinating centre for linking clinical and information-based "adolescent-friendly" services across a wide geographic area, rather than as a single service site (Personal Communication). The aim here is for active reference between sites serving a given catchment area of adolescents, rather than for any one site to try and provide all services.

Multipurpose youth centres have been widely used in Latin America and more recently in Africa. Action Health Incorporated in Nigeria, for example, runs a Youth Centre in northern Lagos, which is visited every month by young people who want to attend training courses, workshops and other meetings and use the reference library (Williams et al., 1997).

6.5 Treatment of individual syndromes

(a): Vaginal discharge
WHO recommends that treatments for vaginal discharge cover bacterial vaginosis, trichomoniasis and candidiasis according to the following regimens:

- **Bacterial vaginosis**
  metronidazole 2 grams single, oral dose
  or
  metronidazole 1 gram orally, twice daily for one day
  or
  metronidazole 10mg/kg body weight orally, 3 times a day for 7 days
  or
  metronidazole 7.5mg/kg body weight orally, 4 times a day for 7 days.

- **Trichomoniasis**
  metronidazole 2 grams single, oral dose
  or
  metronidazole 1 gram orally, twice daily for one day
  or
  metronidazole 5mg/kg body weight orally, 3 times a day for 7 days.

- **Candidiasis**
  miconazole or clotrimazole, 200mg intravaginally, daily for 3 days
  or
  clotrimazole 500mg intravaginally, as a single dose
  or
  nystatin 100 000 IU intravaginally, daily for 14 days.

At a glance		
Drug options for bacterial vaginosis	**Drug options for trichomoniasis**	**Drug options for candidiasis**
Metronidazole	Metronidazole	Miconazole
		Clotrimazole
		Nystatin

Note 1: Metronidazole is contraindicated in the first trimester of pregnancy. People taking metronidazole or other imidazoles should be cautioned to avoid alcohol while taking the drug and for 24 hours after taking the last dose.

(b): Cervical infection
Where the local, appropriately adapted risk assessment is positive, and cervical infections are also to be treated, WHO currently recommends that both gonorrhoea and chlamydia should be covered according to the following schemes:

- **Gonorrhoea**
  Uncomplicated urogenital infection
  ceftriaxone 125mg intramuscular injection, as a single dose
  or
  cefixime 400mg orally, as a single dose
  or

cefixime 8mg/kg body weight orally, as a single dose for those below 12 years

or

spectinomycin 2g intramuscular injection, as a single dose for individuals with a body weight of 45kg or more

or

spectinomycin 40mg/kg body weight intramuscular injection, as a single dose for individuals with a body weight below 45kg.

- *Chlamydia*
  doxycycline 100mg orally, twice daily for 7 days for individuals with a body weight of more than 45kg

  or

  doxycycline 2,2mg/kg body weight orally, twice daily for 7 days for individuals weighing 45kg or less

  or

  azithromycin 1 gram, orally, as a single dose

  or

  erythromycin 500mg orally, 4 times a day for 7 days for individuals weighing 45kg or more

  or

  erythromycin 50mg/kg/day orally, up to a maximum of 2g, divided into 4 doses, for 7 days.

When the patient presents with lower abdominal pain and pelvic infection is diagnosed, then in addition to treatment for gonorrhoea and chlamydia, treatment should also be given for anaerobic bacterial infections. Hospitalization may be recommended when: diagnosis is uncertain; surgical emergencies cannot be excluded; severe illness is present; the individual is pregnant; the person is unable to follow or tolerate an outpatient regimen; or they have failed to respond to outpatient therapy.

- *Anaerobic infections can be treated with:*
  metronidazole 400mg orally, twice daily for 10 days

  or

  clindamycin 900mg by intravenous injection every 8 hours.

At a glance	
Drugs for gonorrhoea	**Drugs for chlamydia**
Ceftriaxone	Doxycycline
Cefixime	Erythromycin
Spectinomycin	Azithromycin

Note 2:   In children under 12 years of age and during pregnancy, tetracyclines (including doxycycline) are contraindicated.

Note 3:   Co-infections are probably less common in adolescents than in adults because in the general population of adolescents gonorrhoea prevalence is low. Therapeutic choices for gonorrhoea depend upon age, pregnancy status and presence of complications.

Note 4:   Ciprofloxacin is contraindicated in pregnancy, and is not recommended for use in children and adolescents. However, it has been used in the treatment of other illnesses in these age groups.

Note 5:   As a large proportion of gonococcal isolates worldwide are resistant to penicillin and tetracycline, these are no longer recommended treatments for gonorrhoea.

Note 6:   Generally, penicillins and cephalosporin are ineffective and should not be used.

(c): Male urethritis

As in previous section, should be treated with antibiotics effective against both chlamydia and gonorrhoea.

(d): Genital ulcer disease

Where genital ulcer disease is confirmed, individuals of either sex should be treated for both syphilis and chancroid. Consideration should also be given to the treatment of herpes simplex infection where prevalence is high and a local protocol for its incorporation into algorithms has been established.

- **Syphilis**

  Recommended

  benzathine benzylpenicillin[1] 2.4 million IU, intramuscular injection, as a single dose

  or

  benzathine benzylpenicillin 50 000 IU/kg, intramuscular injection up to a maximum of 2.4 million IU, as a single dose.

  As the volume of the diluent is too large this dose is usually given as two injections at separate sites.

  Alternative regimen

  procaine benzylpenicillin[2] 1.2 million IU, by intramuscular injection, once daily for 14 consecutive days.

  Alternative regimen for penicillin-allergic, non-pregnant clients

  tetracycline 500mg orally, twice daily for 14 days

  or

  doxycycline 100mg orally, twice daily for 14 days

  or

  erythromycin 500mg orally, 4 times a day for 14 days for individuals of 45kg or more

  or

  erythromycin 50mg/kg/day orally, up to a maximum of 2g, divided into 4 doses, for 14 days.

- **Chancroid**

  ceftriaxone, 250mg intramuscular injection, as a single dose

  or

  azithromycin 1 gram orally, as a single dose

  or

  erythromycin 500mg orally, 4 times a day for 7 days for individuals weighing 45kg or more

  or

  erythromycin 50mg/kg/day orally, up to a maximum of 2g, divided into 4 doses, for 7 days.

6.6 STI management for the pregnant adolescent

Just because they are pregnant, and possibly married, does not nullify any of the needs that adolescents have for information, skills and support. They too are sensitive to health-care provider attitudes which may discourage them from attending antenatal care (Stevens-Simmond et al., 1992). MCH staff therefore need to be trained to screen and manage adolescents who, along with their offspring, represent a very vulnerable group in terms of STIs and their consequences.

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[1] Benzathine benzylpenicillin synonyms: benzathine penicillin G; benzylpenicillin benzathine; benzathine penicillin.

[2] Procaine benzylpenicillin synonyms: procaine penicillin G.

Aqueous benzylpenicillin synonyms: benzylpenicillin potassium; benzylpenicillin sodium; crystalline penicillin, penicillin G potassium; penicillin G sodium.

Little special attention is given, however, to adolescent girls who are pregnant, and to whom antenatal care is made available on the same basis as that for older women. Nor is special attention given to the fact that pregnant adolescents are more likely to have an STI than non-pregnant adolescents, or that adolescents have a several-fold higher risk of being positive for chlamydia than older pregnant women. At present the only STI systematically treated during pregnancy in developing countries is syphilis.

There are few detailed studies of adolescent pregnancy care in developing countries but adolescent girls are often regarded as a difficult group to reach. Poor attendance has been reported by adolescents from low socioeconomic backgrounds (Boult & Cunningham, 1995); by girls attending school at the time they became pregnant (LeGrand & Mbacké, 1993); by younger girls (under 18 years); and by adolescents in a subsequent pregnancy (Blankson et al., 1993).

Although adolescents in some studies were found to be poor antenatal attendees, this is not universally the case. One study of over 600 rural pregnant girls in Malawi found that most attended at least four antenatal visits (Brabin et al., 1998). In fact, their tendency to present in early pregnancy could leave them vulnerable to STI as they may be reinfected later in pregnancy. One recent study has questioned whether a single treatment course with benzathine penicillin will be sufficient to prevent adverse pregnancy outcome in women whose partners are not treated (Donders et al., 1997).

One study in an antenatal clinic in South Africa (Donders et al., 1997) found that three out of every four pregnant women screened for syphilis were young and single. It can probably be assumed that they were also at high risk of other STIs. Screening, case finding and treatment of a broader range of STIs should therefore be considered in antenatal populations in which there is a high proportion of adolescents.

Adolescents with STIs should also be encouraged to attend for postpartum care and their babies closely monitored. Every effort should be made to contact and treat partners, and to counsel partners to use condoms. This is particularly important in areas with high HIV prevalence. Although 25% of females in such areas may already be infected with HIV by the first pregnancy, 75% remain uninfected and are in need of future protection.

Building competencies

WHO recommendations on screening for syphilis are summarized in Box 5. MCH staff in areas where adolescent pregnancy is common may benefit from a course on the management of adolescent pregnancy (including the syndromic management of STIs) and might be encouraged to develop special information sessions for this age group. Where capacity does not allow for this, MCH staff should be linked to other adolescent-friendly services, if available, especially those that are able to offer more comprehensive counselling and postpartum support.

Box 5: Indications for treatment of syphilis as part of antenatal care

- Use RPR card – confirm, if possible, by TPHA
- Treat RPR positives
- Treat RPR positives, confirmed by TPHA
- If RPR positive but TPHA negative and there is no clinical or epidemiological evidence of syphilis, do not treat. Repeat test within 4 weeks.

After treatment
- Quantitative RPR (i.e. monitor antibody titres) after 3 months. *Re-treat* if there is:
  – a sustained fourfold rise in titres
  – no evidence of a fourfold decrease over a 3-month period.
- Those adequately treated in the past do not need re-treatment unless there is evidence of:
  – clinical signs
  – history of recent exposure to symptomatic partner.

(*Guidelines for prevention of adverse outcomes of pregnancy due to syphilis*: WHO, 1991)

6.7 Unresolved problems

In developed countries, screening programmes for chlamydia, which usually target young women below 25 years, are increasingly being introduced in line with perceptions that chlamydial infections pose one of the most serious treatable STI problems for young women (Hillis et al., 1995). Screening for chlamydia is at present not an option in developing countries as the techniques involved require expensive reagents or kits. Screening for chlamydia also needs to be repeated at intervals. In developed countries this would normally be timed to coincide with an annual pelvic examination. In developing countries, the syndromic management of STI is likely to have little impact on chlamydial infections (Brabin, 1996a). Most adolescent infections are asymptomatic and consistent risk markers for repeat infections have not been identified (Mosure et al., 1996). It may be that other approaches should be assessed. Although not universally supported, the epidemiological treatment of those at high risk could be one such approach.

Studies in STD clinic attendees, sex workers and pregnant women have shown that genital shedding of HIV DNA occurs in as many as 30% of women (John et al., 1997). Viral shedding is thought likely to increase infectivity to male partners, and to offspring through vertical transmission. The Centers for Disease Control and Prevention (1998) have indicated that, because most adolescents have been recently infected and are in an early stage of infection, they would be ideal candidates for antiretroviral therapy. They have reservations, nonetheless, about compliance of adolescents with the complicated drug regimes that would be offered in a western clinical setting. Treatment with short-course antiretroviral therapy is becoming an issue in developing countries and decisions will need to be made as to which groups treatment should be extended for maximum impact. HIV-positive adolescent girls may represent an important group for whom treatment should be considered.

1. **ADVERTIZE THE SERVICE**

Adolescents
HEALTH CENTRE
Welcome here!

2. **MAKE THE ADOLESCENTS WELCOME**

- Be friendly
- Settle him/her down
- Have information to look at

3. **TAKE THE ADOLESCENT TO A PLACE WHERE YOU CANNOT BE OVERHEARD FOR CONSULTATION**

Private

5

Information Centre
Social Service
Laboratory
ANC

4. **MAKE YOUR ASSESSMENT**

- Introduce yourself. Assure confidentiality. Quietly discuss the nature of the problem. Take medical history and assess sexual behavioural risk.

- Establish if the presenting STI requires clinical examination

- If so, ask the patient's permission. Explain what is involved, and why it is necessary. Reassure. Bring in companion if requested.

- Make diagnosis and inform adolescent clearly about the infection and required action. Check understanding

- Provide prescription or treatment. Ideally, treat under supervision. Don't forget other medical problems needing treatment or follow-up (.e.g. dysmennorhoea, anaemia)

- discuss carefully future action required and where he/she and partner(s) can go for help. Are there particular problems requiring referral? HIV status, sexual abuse, psychological problem). Refer to skilled counsellor if required

- Provide condoms. Demonstrate use. Ensure he/she knows where to obtain more. Are other contraceptives required?

- Is the adolescent pregnant? Refer for ANC. If the pregnancy is unwanted provide counselling

- Send adolescent away with written and referral/follow-up information as appropriate

- Complete case notes and file records. Record STI details for monitoring

Annex II
Tanner Sexual Maturity Ratings (SMR)

Female Pubic Hair Development

SMR 1:   Prepubertal. No pubic hair.

SMR 2:   Straight hair is extending along the labia and, between ratings 2 and 3, begins on the pubis.

SMR 3:   Pubic hair has increased in quantity, is darker, and is present in the typical female triangle but in smaller quantity.

SMR 4:   Pubic hair is more dense, curled, and adult in distribution but is less abundant.

SMR 5:   Abundant, adult-type pattern; hair may extend onto the medial aspect of the thighs.

Female Breast Development

SMR 1:   Prepubertal. Elevations of papilla only.

SMR 2:   Breast buds appear. Areola is slightly widened and projects as small mound.

SMR 3:   Enlargement of entire breast with no protrusion of the papilla or of the nipple.

SMR 4:   Enlargement of the breast and projection of areola and papilla as a secondary mound.

SMR 5:   Adult configuration of the breast with protrusion of the nipple. Areola no longer projects separately from remainder of breast.

Male genital and pubic hair development

SMR 1:   Prepubertal. No pubic hair. Genitalia unchanged from early childhood.

SMR 2:   Light, downy hair develops laterally and later becomes dark. Penis and testes may be slightly larger. Scrotum becomes more textured.

SMR 3:   Pubic hair has extended across the pubis. Testes and scrotum are further enlarged. Penis is larger, especially in length.

SMR 4:   More abundant pubic hair with curling. Genitalia resemble those of an adult. Glans has become larger and broader. Scrotum is darker.

SMR 5:   Adult quantity and pattern of pubic hair, with hair present along inner borders of the thighs. The testes and the scrotum are adult in their size.

List of Figures, Boxes and Tables

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