

Sexually Transmitted Infections in Children and Adolescents

Dr. T.V. Ram Kumar

Abstract

Sexually transmitted infections (STI) or venereal diseases are a group of infections that are transmitted due to sexual contacts. These occur in children and adolescents mostly as result of sexual assaults or abuses. Increasing number of cases are also seen in the sexually experienced older children. These infections can be asymptomatic or can have a specific symptom complex. Few of these conditions can present with common symptoms like pain or discharge. Prompt recognition of these conditions have good prognosis. Human Immunodeficiency Virus (HIV) infection also has similar mode of transmission as other STIs and there is a role of post-exposure prophylaxis to eliminate the infection. A good psychosocial support and privacy to treatment is required to maintain productive social life.

Introduction

Sexually transmitted infections are usually seen in children who are victims of sexual abuse and in adolescents who have multiple sex partners [1]. Several of these infections may present with a common symptom complex or a single infection with different presentations. Prompt recognition and treatment of these infections result in effective cure and control of transmission of these diseases.

Epidemiology

Risk of acquiring STI follows oral, vaginal and anal sexual activity. Most of the cases

occur in Indian context as a result of sexual abuse and assault. The prevalence varies widely depending on the residential area of population. The prevalence is much higher in slums where migrant workers and transgender live and low socioeconomic conditions prevail [2,3]. The risk increases with increase in number of sexual partners and practice of unprotected sex. The young girls are victims due to the blind belief that cure of STIs is possible on having intercourse with virgin girls. These cases are usually under reported either due to social stigma or due to threats from assailants. Many of these children do not even understand the nature of crime. The prevalence of STIs worldwide varies from 0.8% to 16% [3,4]. Hence it is very vital to teach parents, teachers, and social workers regarding the recognition of these crimes. In the recent period, sexual activity among older children and adolescents have increased. They are vulnerable due to their limited abstract thinking and belief of invulnerability and uniqueness. Adolescents particularly girls are biologically vulnerable to acquire STI due to cervical ectopy, and smaller introitus. The adolescents indulge in unprotected sex due to less access to barrier contraceptives. In the United States, 50% of STIs are seen in age group of 15-24 yrs [5]. The common agents of infection include fungal (Candida), bacterial (chlamydia, gonorrhoea, and syphilis), parasitic (trichomoniasis), and viral (Herpes Simplex Virus (HSV), Human Immunodeficiency Virus (HIV), Hepatitis, and Human Papilloma Virus (HPV). In an Indian study conducted at GTB Hospital, New Delhi, there were 58 (16%) cases of STD under 14 yrs out of total 362 patients found in 18 months study period. Two-third of them were males. All of them belonged to low socio-economic strata and

were slum dwellers around Delhi-Uttar Pradesh border. All of them had contact with prostitutes and infections they acquire were syphilis, gonorrhoea, and chancroid [3].

Clinical features

The clinical features are classified according to the site and nature of lesion.

- 1) **Urethritis:** There is inflammation of urethra that presents with dysuria, burning micturition, itching, and meatal discharge. In males, 30% to 50% can be asymptomatic, where diagnosis is made by clinical signs alone. Pus is discharged from the meatus spontaneously or by gentle pressure. Most common causes are Chlamydia and N. gonorrhoeae [6,7]. Uncommon causes include T. vaginalis, HSV1 & 2, and Epstein Barr Virus (EBV).
- 2) **Epididymitis:** This condition results from the inflammation of epididymis and presents with ipsilateral scrotal swelling and pain. There is tender palpable epididymis, associated hydrocele, and history of urethral discharge [6,7]. The common causative pathogens are Chlamydia trachomatis and N. gonorrhoeae.
- 3) **Vaginitis:** There is inflammation of superficial vaginal mucosa, with or without extension to vulval region. The presentation varies with the pathogen. Bacterial vaginosis is caused by Gardnerella vaginalis, Ureaplasma, Mycoplasma, and anaerobic bacteria. Pathogenic bacteria replaces peroxide producing commensals. This condition has also been seen with lesbians. Trichomonas vaginalis, a protozoan produces symptoms of vulvar redness, pruritus, and foul smelling

greenish discharge. *Candida albicans* produces similar picture with vulval irritation, pruritus, but has characteristic thick curdy vaginal discharge. In severe cases, there is fissures and excoriations. These infections occur in isolation or in combinations [8,9].

4) **Cervicitis:** The inflammation of cervical wall (endocervix) may be asymptomatic or may present with irregular bleeding. There is characteristic endocervical mucopurulent discharge (swab sign) and/or endocervical bleeding due to friability. The common pathogens are *C. trachomatis* and *N. gonorrhoeae*.

5) **Pelvic Inflammatory Disease (PID):** PID is a severe form of disease involving upper genital tract. The common pathogens are *C. trachomatis* and *N. gonorrhoeae*. They can also result from infections due to *G. vaginalis*, *Haemophilus influenza*, anaerobes, *Mycoplasma*, and *cytomegalo virus (CMV)*. It involves endometrium (endometritis), fallopian tubes (salpingitis), tubes and ovary (tubo-ovarian mass or abscess), or localized/diffuse peritonitis which has adverse long term outcomes like infertility and extrauterine pregnancy. The condition may be asymptomatic during acute stage, and may be recognized later due to fertility issues. The diagnosis in acute stage is made if any of the following signs are present: cervical tenderness on movement, uterine tenderness or adnexal tenderness on internal examination. The extent of involvement can be evaluated by Ultrasound (USG), contrast enhanced computed tomography (CECT), or magnetic resonance imaging (MRI) or laparoscopy. Early diagnosis and treatment always has better outcomes.

6) **External Genital lesions:** They present as warts caused by HPV (low risk types 6 and 11, or high risk types 16 and 18). Few other lesions include Condylomata (syphilis) and Molluscum contagiosum. Ectoparasites like lice and scabies can also be transmitted due to intimate physical contact [10].

7) **Genital ulcers:** The causative pathogens are HSV (genital herpes), *Treponema pallidum* (chancre), *Hemophilus ducreyi* (chancroid). Ulcer occurs over penis or vulva, but it can also occur in oral mucosa and rectal mucosa due to unusual sexual practices. Genital Herpes is most commonly caused by HSV2, and less commonly by HSV1. They are usually recurrent. HSV1 cases are on rise in men having sex with men (MSM). There are many asymptomatic cases that transmit to others. The lesion starts as a vesicle, which ruptures to a painful, shallow ulcer. There are constitutional symptoms with inguinal adenopathy. The recurrent lesions are less severe, and there is long term subclinical shedding [11]. Chancre is characteristic of primary syphilis. The lesion is solitary and painless. Adenopathy is occasional and less severe. Chancroid presents as painful, multiple unindurated and undermined ulcers with a purulent base. There is unilateral or bilateral painful adenopathy. In severe cases, there is inguinal bubo formation, which can rupture. Lymphogranuloma venereum (LGV) transmitted by L1-L3 serovars is seen in cases of MSM [12]. The other organisms that are transmitted include

HIV, Hepatitis B virus (HBV), CMV, and many gastrointestinal pathogens that are transmitted due to adolescent sexual practices.

Diagnosis

As per Centers for Disease Control and Prevention (CDC), there are recommendations for routine screening in sexually active adolescent females and males. They are screened for *C. trachomatis*, *N. gonorrhoeae*, syphilis, HIV, HBV, and Hepatitis C virus (HCV). The key for successful screening is a thorough sexual history taking to identify adolescents who need to be further tested for STI [13]. The discussions should be private, and should be individualized to avoid social stigma. Similarly the victims of abuse and sexual assault should receive utmost care and social support during screening and examination.

The essential tests include Gram staining of secretions and nucleic acid amplification test (NAAT) of urine/urethral/cervical/vaginal/anal/oral secretions to detect *C. trachomatis* and *N. gonorrhoeae*. Presence of Gram-negative intracellular diplococci in specimen suggests *N. gonorrhoeae* infection. In adolescent females with vaginitis, the vaginal discharge specimen is subjected to routine pH test (>4.5 is suggestive of bacterial vaginosis or trichomoniasis) and microscopy studies with dilution in normal saline or 10% Potassium hydroxide (KOH). The saline samples are used to find motile or dead *T. vaginalis* or clue cells (clue cells are epithelial cells with obscured borders due to small bacteria), and KOH specimens are used for diagnosing yeast or *Candida pseudohyphae*. There are many recent Clinical Laboratory Improvement Amendments (CLIA) approved tests that are sensitive, more easily performed and detect multiple organisms

like OSOM (Genzyme Diagnostics, Cambridge, Mass), Trichomonas Rapid test, OSOM BV BLUE test, Affirm VPIII. The Pelvic Inflammatory Disease is diagnosed as a combination of history taking, examination, and laboratory tests. A low threshold is necessary for making the diagnosis. The patient needs to be investigated using transvaginal USG, or laparoscopy (including biopsy) to assess the extent of disease and deciding the treatment. HSV is diagnosed by Tzanck smear (less sensitive and nonspecific) and NAAT, including PCR assay (more sensitive). Syphilis is diagnosed by VDRL (Venereal Disease Research Laboratory) test or RPR (Rapid plasma reagin), treponemal EIA (enzyme linked immunosorbent assay) or CIA (enzyme or chemiluminescence immunoassay). HIV screening is highly essential at ICTC (integrated counseling and testing centers) [13].

Differential diagnosis

Similar symptoms can be seen in number of other infections/conditions. These conditions have to be ruled out for appropriate treatment. The conditions where symptoms can mimic STIs include urinary tract infection, acute appendicitis, colitis, tuberculosis (abdominal and urogenital) tubal pregnancy, Behcet disease, physiological secretions.

Treatment

The adequacy and completeness of treatment requires easy accessibility and privacy. Complete treatment includes the treatment of the individual and all the sexual contacts within last 60 days or the last contact if more than 60 days. There is delay in seeking medical help by female adolescents due to social stigma and in adults due to inability to differentiate pathological discharges from the

normal one. Appropriate treatment of the disease is essential to decrease the chances of infertility in future. The patient also needs to be tested for pregnancy. Repeat testing is required after 3 months [13]. The treatment of partner is ideal after physical assessment, however in cases where direct examination is not possible, one partner is given the prescription/medication for the other

partner. This is called expedited partner therapy (EPT) or patient delivered partner therapy (PDPT) [14]. The regimens for the treatment of the STIs have been depicted in table 1. The complicated cases may require referral to higher centers. Along with medical treatment, sexual abuse or assault cases need to be given adequate social support and psychiatric counseling.

Table 1: Management of uncomplicated STI

Infection	Treatment
N. gonorrhoeae	Inj. Ceftriaxone 250mg i.m. stat + 1gm Azithromycin stat (Single Dose)
Chlamydia trachomatis	Doxycycline 100mg twice daily x 7 days Or Azithromycin 1g stat (Single Dose)
Chlamydia trachomatis (L1,2,3) LGV	Doxycycline 100mg twice daily x 21 days
Primary and secondary syphilis	Inj. Benzathine Penicillin G 2.4 million unit i.m. stat (Doxycycline 100 mg BD x 14 days if allergy to penicillin).
Late syphilis	Inj. Benzathine Penicillin G 2.4 million unit i.m. weekly for 3 weeks (Doxycycline 100 mg BD x 28 days if allergy to penicillin).
H. ducreyi	Azithromycin 1gm oral single dose or inj. Ceftriaxone 250 mg i.m. single dose
T. vaginalis	Tab. Metronidazole 2gm single dose.
Scabies	5% Permethrin or Tab. Ivermectin 200 μ g/kg oral 2 doses 2 weeks apart.
Pubic lice	1% Permethrin local application. Rinse after 10 min.
Herpes simplex virus	Acyclovir 400 mg TDS x 7-10 days (1st episode) Acyclovir 400 mg TDS x 5 days (recurrence)
HPV (uro-ano-genital warts)	Podofilox 0.5% (for external genitalia only) or cryotherapy or Trichloroacetic acid application (all types)

Prevention

STIs can be prevented by avoiding close sexual contacts. Prevention strategies include abstinence, single sexual partner, and effective use of barrier contraceptives. Sex education particularly to adolescents can go a long way in preventing STIs. The HPV infection can be prevented by HPV vaccination in the adolescents [15,16].

Conclusion

Estimating the true incidence/prevalence of STIs is very difficult due to the asymptomatic nature of many infections, and social stigma as that

would reveal the individual sexual history and preference. On the other hand, the cases are on a rise due to poverty, migration, child labor, and illiteracy. With changes in lifestyles and independency, cases are also being reported among affluent classes with drug-addiction. This menace needs to be addressed by appropriate sex education of adolescents and periodical assessment by questionnaires to find out issues like drug addiction, depression, and child abuse. Timely and appropriate treatment can cure some of the conditions and preserve the fertility in females.

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