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Trends in sexually transmitted infections in India

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ABSTRACT

Sexually transmitted infections (STI) are a significant health problem and there has been a steady increase in the STI's worldwide and in India. The pattern of STI's varies not only in different parts of the world but also even in different parts of India. Viral STI's are emerging to be the most common STI's in India a trend which has been identified in the developed countries.The syndromic approach to treatment where common etiologic agents responsible for a group of symptoms are treated with or without investigations, has revolutionized the treatment of STI and now all doctors and paramedics can treat STI following simple flow charts. The interaction of sexually transmitted pathogens and HIV are other significant changes in the field of ST which has modified clinical symptoms, investigations and treatment of STI.

INTRODUCTION

Sexually transmitted infections (STI) are a major public health problem and have a tremendous impact on the national health. The epidemiology of STI in a given community is very dynamic and with better methods of diagnosis, treatment and prevention and the emergence of HIV there has been a continuous change in the pattern of the various STI. However there is a paucity of a reliable surveillance system in most of the developing countries including India and most data are derived from tertiary care centers and do not reflect the actual burden of disease in the community. Lack of adequate laboratory infrastructure at the primary and secondary care levels hinders the confirmation of diagnosis and most of the data available is syndromic. In India because of the stigma associated with STI, patients prefer to get treated from traditional healers, quacks, pharmacists and private practitioners rather than governmental hospitals and fail to get notified. There is also considerable variation in the prevalence of various STI in different parts of the country. But there is a definite need for demographic data for designing control pro-

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grams as well as for evaluating existing programs.

Global trends

According to WHO estimates, 333 million cases of new curable STI occur, of which 150 million were in south and southeast Asia and 65 million occurred in sub-Saharan Africa(1).

In the U.S, the CDC estimates that 19 million new infections occur each year, 50% of which occurs in the young, aged 15 – 24 years(2). The changes in sexual behavior – decrease in the age at first intercourse, increase in lifetime partners, concurrent relationships, decrease in safe sex practices among homosexual men, prostitution and sex in exchange for drugs contributing to the rise.

In developed countries, the prevalence of STI has steadily increased. The viral STI and genital chlamydial infections are on the rise in most developed countries. The emergence of HIV infection and the subsequent behavioral, social and psychological changes, and better treatment of bacterial STI has contributed to the increasing prevalence of viral STI.

Indian scenario

In India, 50 million new curable STI are estimated to occur in adults every year. In the 1970s, syphilis and chancroid were the main causes of genital ulcer disease (GUD),

Table 1: Trends in STI in STI Clinic Attendees in Tertiary Hospitals of India

S. No.	Region	Syphilis	Chancroid	LGV	Donovaniosis	Genital Herpes	HPV	Gonorrhoea	NGU
1.	Delhi(4) 1955-61	7.3	22.5	0.6	0.25	-	-	15.9	4.9
	Delhi(5) 1965-78	54.9	5.9	0.9	1.2	2.5	2	1.9	-
	Delhi(6) 1989-95	14.3	23.9	1.6	1.4	11.8	9.2	12.2	3.7
	Delhi(7) 1995-99	15.6	11	0.45	0.48	11.8	9.3	11.6	7.4
2.	Chandigarh(8) 1977-85	10.4	12.2	0.6	6.3	11.4	21.4	16.9	4.1
	Chandigarh(9) 1985-92	8.7	8.1	0.9	1.6	19.7	25.2	5.3	4.1
	Chandigarh(10) 1995-96	2	3	6	0.5	21	7	3	6
3.	Rohtak(11) 1992-94	30.2	22.1	0.97	1.45	10.6	18.1	12.9	4.7
	Rohtak(12) 1995-96	7.4 - P 17.5 - S	14.5	0.67	0.8	11.1	21.5	12.6	6.7
	Rohtak(13) 1995-2000	24	10.9	0.2	0.86	16.9	19.4	16.2	4.8
4.	Ahmedabad(14) 1993-94	22.2 - P 28.7 - S	7.6	0.58	2	8.2	7.2	5.05	-
	Ahmedabad(15) 1998-99	28.9	9.6	-	1	27.9	9.1	12.7	1.5
5.	Pondicherry(16) 1982-90	18	10.6	8	8.2	14.1	11.9	11.9	0.8
6.	Kurnool(17) 1992-96	14.4	2.8	9.7	-	14	11.3	11.7	19.1

while viral GUD such as genital herpes were uncommon. But, from the 1980s there has been a steady rise in the viral STI and a relative fall in the traditional, treatable bacterial STI. Data from the tertiary care hospitals(Table 1) in India have shown an increase in the viral STI similar to the changes in developing countries and genital herpes has emerged as the most common STI at Chandigarh (21% in 1995-96) and a close second most common STI in Ahmedabad (27.9% in1998-99) and Delhi(11.8% in 1995-99). At the premier hospitals (Table 2), herpes genitalis and condylomata acuminata together constitute

Table 2: Prevalence of STI in premier Institutes of India

STI	AIIMS	PGI(9)	JIPMER
HPV	24.6	25.2	19.8
Genital herpes	24.2	19.7	28.3
Syphilis	14.0	8.7	25.9
Gonorrhoea	10.1	5.3	6.2
NGU	5.8	4.1	0.5
Chancroid	6.3	8.1	4.5
Donovanosis	1.1	1.6	4.8
Multiple	10.1	5.7	—

44.9% to 48.8% of the total STI. However in the district hospitals, studies in 1994 and 1998 have shown that the common STI still continue to be chancroid and gonorrhea (Table 3). In a population based study conducted in Tamil Nadu, 47.3% of individuals had reported genital symptoms. The prevalence of STI was as high as 15.8% and that of classic STI was 9.7%. Vaginal discharge was the most common STI syndrome

Table 3: Prevalence of STI in District Hospitals of India

STI	Tezpur(18)	Portblair	Srinagar(19)
	(1994)	(1994)	(1998)
Chancroid	35.0	21.0	28.8
Gonorrhoea	17.8	19.0	11.7
Syphilis	14.6	25.0	20.8
LGV	10.2	-	9.7
HPV	9.2	9.0	11.3
HG	5.0	7.0	4.1
NSU	3.3	0.7	2.6
Donovanosis	0.013	-	0.22

and was found in 41.5% of women. In men, scrotal swelling (2.1%) and urethral discharge (0.2%) were most common(3). In a study conducted in Varanasi, where 1500 male students were screened, 3.93% were found to have an STI.

Syphilis

In developed countries, the prevalence of syphilis has fallen steeply because of improved access to health care, effective control programs and efficacious treatment. However, its prevalence is still high in some developing countries especially in Africa and an estimated 12 million cases occur globally every year.

In the U.S., the prevalence rates of syphilis are on the rise especially in men because of increased MSM which is more prevalent in the urban areas. In 2004, syphilis was 5.6 times more common in blacks although the racial gap seems to be narrowing with significant increasing rates in white men and declining rates in African Americans.

In India, syphilis incidence rates are on the decline in most of the tertiary care hospitals. In a tertiary hospital in Delhi, the cases of syphilis declined from 61.2% to 9.1% from 1954 to 1994 although the total STD cases had increased eight times. In a population based study in Tamil Nadu its prevalence was as low as 0.3%. However, prevalence of 8% was found in tribals of Gadchiroli, Maharashtra suggesting that pockets of high prevalence still persist. In a study of 494 cases of syphilis from Trivandrum, latent, secondary and primary syphilis accounted for 54%, 38.4% and 6.3% of cases respectively. The seroprevalence of VDRL reactivity among blood donors in various parts of the country ranged from 0% in Lucknow, 2.8% in Delhi, 3.62% in Tirunelveli and 7% in Bihar. The VDRL positivity rate among antenatal women was 2.9% and 3.4% in Aligarh and Delhi respectively. It is estimated that yearly 344,000 to 516,000 newborn are at risk of exposure to syphilis at birth which is more than the mother to child transmission of HIV.

Chancroid

Chancroid is an uncommon STD in most developed countries. Its incidence has progressively declined although chancroid outbreaks have occurred in New York (1997) and New Orleans (1990-1992). In India, the incidence rates have ranged from 1.6% in Patiala to as high as 51.9% in Mumbai. The rates in district hospitals are still high at 35%, 21% and 28.8% at Tejpur (1994), Port Blair (1994), and Srinagar (1998) respectively. But there has been a steady decline in its rates in tertiary care hospitals in Delhi from 22.5% in 1955-1961 to 11% in 1995-1999; in Chandigarh from 12.2% in 1977-1985 to 3% in 1995-1996; in Rohtak from 22.1% in 1992-1994 to 10.9% in 1995-2000. The declining rates are probably due to easy availability and indiscriminate use of effective antibiotics at the primary care level.

Donavanosis

Donovaniosis is endemic in India, Papua New Guinea, aborigines of Australia, South Africa and Brazil. Racial and ethnic predispositions seem to be associated with the disease. In India, it is common in the states of Tamil Nadu (4.7%), Pondicherry (8.2%), Andhra Pradesh (1.12%), Orissa (7.5%), and Andhra Pradesh (1.12%). The prevalence of the disease is showing a steady decline.

Lymphogranuloma venereum (LGV)

LGV is endemic in West, Central and East Africa, India, Southeast Asia, South America, Papua New Guinea, and the Caribbean Islands. It is less commonly encountered in developed countries. In India, its incidence varies from 0.15% to 9.74% from different parts of the country. Localized epidemics along with HIV infection have been reported.

Gonorrhoea

It is a common STD in most parts of the world although its incidence has steadily declined in the developed countries. In U.S, African Americans remain the group most heavily affected by gonorrhoea. In India, a steady decline has been noted in Delhi and Chandigarh but a marginal increase has been reported from Rohtak and Ahmedabad (Table 1). Its prevalence in gynaecological OPD in Amritsar (1995) and

Chandigarh (1986) is 0.8% and 1.8% respectively. The steady decline is attributed to easy availability and indiscriminate use of effective antibiotics at the primary care level and growing awareness of AIDS in the Indian population.

Chlamydial Infection

Genital chlamydial infection is an STD of epidemic proportion. It causes upto half of all non-gonococcal urthritis and at least one third of acute epididymitis in men. In women, it is responsible for upto half of all mucopurulent cervicitis and 20%-40% cases of pelvic inflammatory diseases with risk of subsequent infertility or ectopic pregnancy. Chlamydia is the most commonly reported infectious disease in the U.S. with 2.8 million new cases occurring every year(2). In Europe, its prevalence varies from 2.6% to 51.5% among women attending various health clinics. In U.K a prevalence rate of 3% to 4% and 3% to 7% was found in family planning and general practice clinic attendees respectively. The increasing rates are attributed to enhanced screening and more sensitive diagnostic tests given the frequent asymptomatic nature of the infection. In India, an incidence rate varying from 1.5% to 19% has been reported from STD clinic attendees from various parts of the country. In Delhi, 26 (21.3%) of 122 pregnant women were positive for Chlamydia trachomatis and it correlated with low birth weight, still birth and prematurity. It is estimated that if 1:10 women carry Chlamydia, 1.77 million newborn are at risk of chlamydia infection and associated risks per year. In women attending gynaecological OPD in Delhi, a prevalence of 41% and 36% was found in vaginal discharge and infertility respetively. High risk factors identified in India include low socioeconomic factors, multiple sexual partners and use of intrauterine devices and protective factors are higher age group and use of oral and barrier contraceptives.

Genital Herpes infection

Genital Herpes is the second most prevalent STD worldwide and the commonest cause of genital ulcer disease in the developed countries. The large population reservoir of undiagnosed cases with risk of transmission and the risk of perinatal transmission pose significant public health implications. In U.S, about one in five persons over age 12 and approximately 45 million people are infected with HSV-2 and upto one million new HSV-2 infections are transmitted annually. In India there has been a significant increase in the proportion of viral STD especially genital herpes with incidence rates varying from 4.11% to 27.9% in STD clinics from various parts of the country. In Chandigarh the incidence increased from 11.4% in 1977-85 to 21% in 1995-96. In Ahmedabad, the incidence increased from 8.23% in 1993-94 to 27.9% in 1998-99. In Delhi also the incidence increased from 8.23% in 1993-94 to 27.9% in 1998-99. The increasing incidence may be attributed to decreasing bacterial STD due to better treatment at the primary level with effective antibiotics.

Human Papilloma virus (HPV) infection

Genital HPV is the commonest viral STD in the developed world, with an estimated 30 million new cases diagnosed annually worldwide. The incidence of genital warts has increased from 13/100,000 in

1950 to 106/100,000 in 1978 in Minnesota. In India, the incidence of genital warts ranges from 2% to 25.2% in STD clinic attendees. The data from different parts of the country show varying trends. In Delhi, in 1955-61, no case was reported; the incidence in 1965-78 was 2% and increased in 1995-99 to 9.3 %. Similarly in Ahmedabad there has been a slight increase from 7.17% in 1993-94 to 9.1% in 1998-99. However the incidence rates have been declining in Chandigarh from 21.4% in 1977-85 to 7% in 1995-96.

Trends in treatment: Syndromic approach

The syndromic approach is based on treating patients of STD on the basis of group of symptoms or syndromes as given below:

STD Syndrome	Possible Causes
• Urethral discharge	Neisseria gonorrhoeae (N. gonorrhoeae) Chlamydial trachomatis (C. trachomatis) D to K
• Genital ulcer disease	Treponema pallidum, Haemophilus ducreyi, C. trachomatis (L1, L2, L3)
• Vaginal discharge	Trichomonas vaginalis, Candida albicans, Gardnerella vaginalis N.gonorrhoeae, C. trachomatis, Anaerobes
• Lower abdominal pain	N. gonorrhoeae, C. trachomatis, anaerobes
• Inguinal Bubo	H. ducreyi, C. trachomatis (L1, L2, L3)
• Scrotal swelling	N. gonorrhoeae, C. trachomatis, viruses and surgical conditions
• Ophthalmia neonatorum	N. gonorrhoeae, c. trachomatis

Advantages of the Syndromic Approach

- Easy and effective and both medical and paramedical can treat STI
- Treatment available at all rural and peripheral centers
- Prompt treatment as no waiting for test results
- Early treatment prevents spread of STI including HIV/AIDS
- Cost effective

Criticisms of the Syndromic Approach

- The syndromic approach is not a scientific procedure.
- Syndromic diagnosis is too simple for a physician to use, and approach does not use a provider's clinical skills and experience.
- Some physicians still feel better treating according to clinical diagnosis in the absence of lab facilities and then, if symptoms do not improve, treating for another cause.

- The syndromic approach wastes a lot of drugs.
- It promotes the development of antibiotic resistance.
- Simple laboratory tests should be included.

Critical appraisal of Syndromic Approach:

- Revalidation has been done in urethral discharge syndrome in men
- Poor results in vaginal discharge syndrome especially Chlamydial cervicitis given the asymptomatic nature of infection.
- Effective in the management of genital ulcer disease
- Data on individual disease is no longer available as laboratory confirmation is not done
- Needs to be reassessed at regular intervals for its effectiveness, according to the changes in the epidemiological patterns in the region and monitoring for drug resistance.

The flow charts for syndromic treatment are available at websites of WHO and NACO (www.who.int/reproductive-health/stis/training.htm and www.nacoonline.org/prg_sche_targetint.htm)

STD and HIV

The NACO has estimated that at least 5.21 million persons have been infected by HIV by 2005. The prevalence of HIV in individual states in 2004 was tabulated (table 4.). Andhra Pradesh has the highest positivity rates in both STI cases and antenatal women. Among the high risk groups, highest positivity was seen in female sex workers in Mumbai with 44.7% positivity and 22% positivity in intravenous drug abusers in Manipur.

Table 4: NACO Prevalence of HIV positivity in 2004

	ANC	STI
Andhra Pradesh	2.25%	16.4%
Tamil Nadu	0.5%	8.4%
Delhi	0.38%	7.98%
Goa	1.13%	15.8%
Karnataka	1.25%	12.0%
Mumbai	1.12%	15.65%
Manipur	1.5%	22.0%

The natural history, manifestations and treatment of STI is altered by concurrent HIV infection in several ways as given below:

Syphilis

Clinical finding

Primary lesions	Painless ulcer becomes painful due to super infection; giant chancre
Secondary lesions	Lues maligna-secondary syphilis with vasculitis manifested by fever, malaise, headache, nodules, indurated plaques with or without hyperkeratoses and or ulceration, sclerosis

Course of the disease	Shorter latent period with rapid progression to tertiary disease within first year of infection, i.e meningovascular syphilis
Serological response to syphilis	Limited or absent antibody response to syphilis with repeatedly negative reagin and treponemal antibody testing in serum or CSF
Diagnosis	In the absence of negative serological tests dark field microscopy, biopsy of the lesion, direct fluorescent antibody staining of material from lesion may be helpful
Treatment	Greater likelihood of treatment failure, relapse without re-exposure despite adequate treatment
Chancroid	
Clinical finding	Genital ulcers tend to be larger and persist longer-Multiple inguinal buboes. Frequent occurrence of giant and phagedenic ulcer.
Treatment	Less responsive to standard therapy, 3 to 4 fold higher failure rate with single dose therapy with azythromycin and ceftrizxone
Herpes genitalis	
Clinical findings	As immunosuppression progresses lesion may persist or progress to chronic enlarged painful ulcers with raised margin, ulcer may bleed.
Treatment	Higher dose and longer period treatment with acyclovir, 400mg orally 5 times daily until complete clinical resolution or 5 to 10 mg/kg IV 8 hourly until clinical healing.
Granuloma inguinale	
Clinical findings	Lesion may be larger, extensive, pseudobubo formation which may burst producing ulceration, slow response to treatment
Treatment	Doxycycline 100mg orally bid or erythromycin 500 mg orally qid for 2-3 weeks.
LGV	
Clinical findings	Acute inflammation with bilateral inguinal bubo which may burst into ulceration
Treatment	Same regiment (doxycycline, 100mg orally bd or erythromycin, 500mg orally qid for 14 days, but prolonged therapy may be required.

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