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Trends of sexually transmitted infections in a tertiary care center: A 5 year's analysis

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Abstract

Background: Knowledge of the changing trends of Sexually Transmitted Infections (STIs) in different geographical regions in association with the epidemiological factors prevailing in the respective geographic areas of a country is necessary for proper planning and implementation of STIs control strategies.

Aim: the aim of the study to determine the current trends of STI in a Tertiary Care Referral Center of Delhi (North India) in 2014-2018 and comparing this data with relevant published data from different parts of India.

Materials and Methods: This hospital-based, retrospective study was conducted from January 2014 to December 2018 at Apex Regional STD Center Safdar Jung hospital, Department of Skin and STD on patients attending sexually transmitted infection (STI) clinic. Diagnosis was made clinically by expert doctors and, if required, appropriate specimen were taken and tested in STD laboratory.

Results: A total of 37,549 patients, 24,995 (66.56%) male and 12,554 (33.43%) females, attended the STI OPD during study period. A trend of increasing total STI cases was observed from 2014 to 2018. Upon analyzing the trends of various STIs, the most common presenting symptoms was of vaginal discharge 1847 (4.9%) which was most commonly due to candidal vulvo-vaginitis, 793 (42.9%), followed by bacterial vaginosis 348 (18.8%) and trichomonal vaginitis 83 (4.4%). The second common presentation was genital ulcer, 1647 (4.38%), which was predominantly caused by herpes genitalis 1212 (73.6%). Number of lab confirmed Syphilis were 842 (2.2%). Genital warts were reported 1127 (3%) in number and 305 (0.81%) urethral discharge cases were diagnosed as the gonococcal urethritis 170 (55.7%) and non-gonococcal urethritis 135 (44.26%) respectively.

Conclusion: In our study most common STI reported was vaginal discharge followed by genital ulcers. A rising trend of viral STI and syphilis was observed from 2014-2018. Gonococcal urethritis was ongoing with its declining trend, by and large similar as mentioned in studies in other regions of India.

Keywords: Sexually transmitted infections, gonococcal urethritis, candidal vulvovaginitis, herpes genitalis, genital warts

Introduction

Knowledge of the changing trends of Sexually Transmitted Infections (STIs) in different geographical regions in association with the epidemiological factors prevailing in the respective geographic areas of a country, is necessary for proper planning and implementation of STIs control strategies. The emergence of HIV infection has further emphasized the importance of STIs control measures. In India, routine surveillance of STIs is quite difficult. Various factors associated with poor recognition of STIs in a developing nation are limited resources, inadequate number of medical professional specialized in diagnosis and treatment of STIs and lack of sensitive and rapid point of care laboratory diagnostic facilities. Social factors such as stigma and discrimination associated with STIs only add to the problem. In due course of time, changes in human psychology and behavior have also modified the trends of STIs. Therefore, this study was conducted to analyze trends of STIs from a tertiary care referral center of Delhi over a period of five years and comparing this data with relevant published data from different parts of India.

Materials and Methods

This hospital-based, retrospective study was conducted from January 2014 to December

2018 at Apex Regional STD Center Safdarjung hospital, Department of Skin and STD on patients attending sexually transmitted infection (STI) clinic. The female patients were also referred from Gynecology department of the hospital. Diagnosis was made clinically (speculum examination for female patients if clinically indicated) and, if required, appropriate specimen such as blood samples, cervical, vaginal and urethral swabs were collected (wherever applicable transport media used) and processed using battery of tests targeted to diagnose the etiology of various STIs syndromes. Socio-demographic characteristics (age, religion, socioeconomic status, education, and occupation) and risk factor for STIs (medical history including presenting sign of STIs, extramarital relationship, and current symptoms of STIs); were recorded by male and female STI counselors and clinical samples were taken by

laboratory technicians as per National aids control organization (NACO) guidelines for diagnosis of sexually transmitted and reproductive tract infections. The study was approved by the ethical committee of Safdarjung Hospital, New Delhi.

Results

A total of 37,549 patients, 24,995 (66.56%) male and 12,554 (33.43%) females, attended the STI OPD during study period. Gender wise 3,875(15.5%) male and 4,715 (37.55%) females patients were diagnosed with STIs. Most common age group affected was 25-44 years (43.96%) in both males and females [Table 1] and least common age group affected was above 44 years (11.49%). A trend of increasing total STI cases was observed from 2014 to 2018.

Table 1: Age Wise Trends of Sexually Transmitted Infections

Age Range	2014-N (20%)	2015-N (19.89%)	2016-N (20.9%)	2017-N (18.6%)	2018-N (20.6%)	Total-N (%)
0-20	1240 (16.5)	1070 (14.3)	1070 (13.7)	1247 (25)	1130 (14.6)	5757 (15.3)
21-24	1875 (24.9)	2018 (27.0)	1900 (24.3)	2218 (%)	2958 (38.3)	10969 (29.2)
25-44	2937 (39.0)	3395 (45.5)	4120 (52.6)	2848 (57.1)	3208 (41.5)	16508 (44.0)

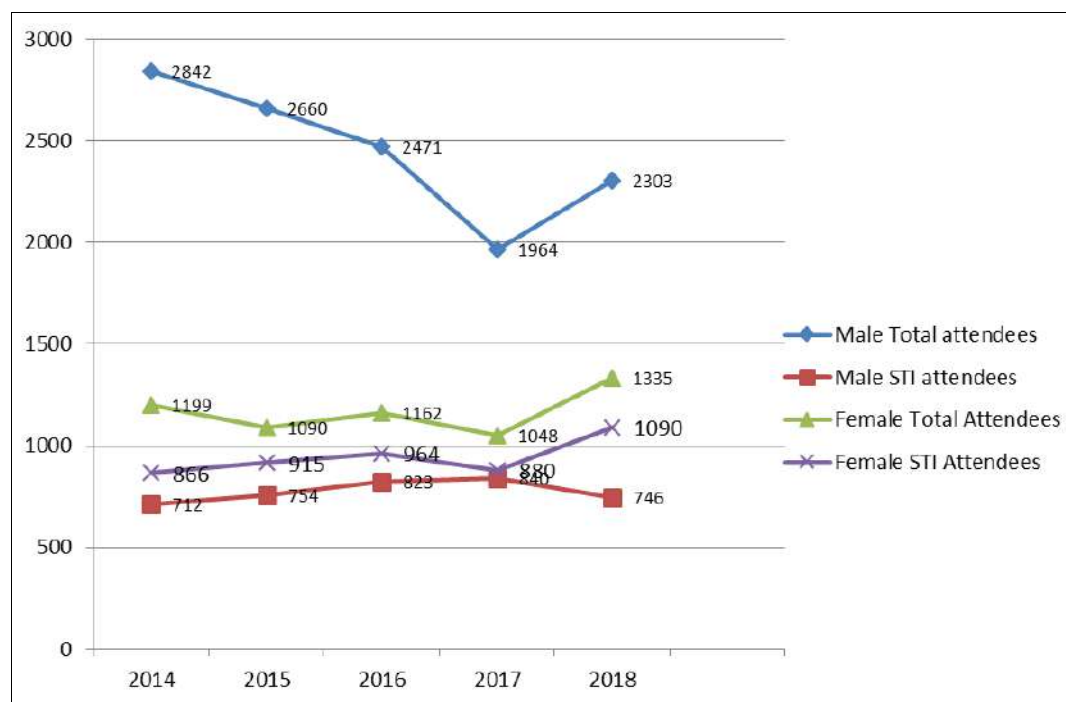


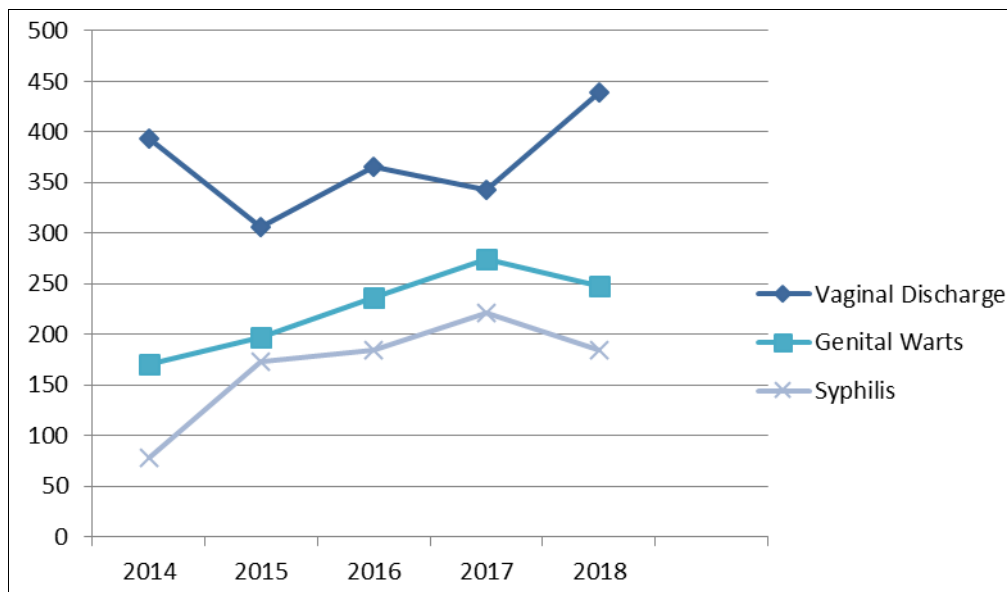
Fig 1: Gender Wise Trends of New STI Attendees (2014-2018)

When the data of new STI clinic attendees was compared from 2014 to 2018, even though there was no significant change in number of total STI clinic attendees ($\chi^2=2.131$, $P=0.1444$); there was a statistically significant decline in the number of male STI clinic attendees ($\chi^2=46.47$, $P\leq 0.0001$)[Fig. 1] while the number of female attendees significantly increased ($\chi^2=8.378$, $P\leq 0.0038$). Similarly

among males there was an appreciable drop in the STI cases ($\chi^2=72.72$, $P\leq 0.0001$). The STI cases increased significantly among females ($\chi^2=21.03$, $P\leq 0.0001$) while non-STI cases showed a noticeable declining trend ($\chi^2=10.36$, $P\leq 0.0013$).

Table 2: Profile of Sexually Transmitted Infections from 2014 to 2018

Sexually Transmitted Diseases/Syndrome	Year 2014 1569 (20.8%)	Year 2015 1659(22.2%)	Year 2016 1785 (22.8%)	Year 2017 1732 (24.8%)	Year 2018 1845 (26.4%)	Total 8590 (22.9%)
Vaginal Discharge	393	306	366	343	439	1847
Bacterial vaginosis	75	78	63	63	69	348
<i>Trichomonas vaginalis</i>	16	24	19	10	14	83
Candidiasis	160	154	183	119	177	793
Genital Ulcer disease (Non herpetic and non-syphilitic)	81	77	86	82	76	402
Genital Ulcer disease (Herpetic)	224	285	244	229	230	1212
Chancroid	5	8	11	2	7	33
Lower abdominal pain	73	85	94	81	69	402
Gonococcal urethritis	23	40	30	41	36	170
Non-gonococcal urethritis	20	23	39	30	23	135
Genital Warts	171	197	237	274	248	1127
Other STIs	501	465	493	429	532	2420
Syphilis	78	173	185	221	185	842

**Fig 2:** Sexually Transmitted Infections with Rising Trends

Upon analyzing the trends of various STIs, the most common presenting symptoms was of vaginal discharge 1847 (4.9%) [Table 2, Fig 2] which was most commonly due to candidal vulvo-vaginitis, 793 (42.9%), followed by bacterial vaginosis 348 (18.8%) and trichomonal vaginitis 83 (4.4%). Incidence of candidal vulvo-vaginitis shows a variable pattern from 2014 to 2018 with highest rate in 2016 (23%). The second common presentation was genital ulcer, 1647 (4.38%), which was predominantly caused by herpes genitalis 1212 (73.6%). Overall herpes genitalis 1212 (3.22%), Non herpetic ulcers (and non-syphilitic) 402 (0.33%) and 33 (0.087%) chancroids were diagnosed in both males and females clinically and/or after microbiological testing [Table 2].

In our study, cases of lab confirmed Syphilis were 842 (2.2%). Not a single case of Donovanosis and lymphogranuloma venereum was diagnosed during the study period. Genital warts were reported 1127 (3%) in number out of total 37,549 patients, as seen in table 2. Other STIs include scabies, epididymo-orchitis, balanoposthitis, tinea genitalis and lice infestation which were reported in variable numbers from Jan 2014 to 2018. Surprisingly, from Jan 2014 to 2018, among 305 urethral discharge cases, the gonococcal urethritis outnumbered the non-gonococcal urethritis cases 170 (55.7%) and 135 (44.26%) respectively. Overall gonococcal and non-gonococcal urethritis incidence was 170 (0.45%) and 135 (0.36%) respectively. When the

incidence of various STIs in 2018 were compared with that of 2014 there was a significant increase in genital warts and syphilis over the five year period ($P \leq 0.0001$ and $P \leq 0.0001$ respectively). [Fig 2]

Discussion

Many factors are associated with STI prevalence in any society, namely, the level of awareness, education, socio-economic status, availability of specialized medical facilities including both clinical and diagnostic. Because of social stigma, poverty, illiteracy and lack of specialized professional and diagnostic facilities at the peripheral and rural health care centers the actual prevalence of STIs is still not well known in different part of India.

In our study, the male attendees were almost double in number in comparison with female attendees at STD clinic. The male: female ratio was 2.09:1.0. This is similar to other published studies where male outnumber the female attendees in STI centers. [1,2,3] The trend from 2014 to 2019 shows increase in number of female attendees and significant drop in number of male attendees. This shows gradually increasing awareness in females coming out of social stigma and improved contact tracing. The STI counselors play an important role in maintaining the records and clearing the doubts and queries of female patients. The most common age affected was 25 to 44 years in both the sexes as people of this age group are sexually active and of

child bearing age.

In our study, most common presenting symptom was vaginal discharge 1847 (4.9%). Identification of causative organism by culture and biochemical testing revealed candidal vulvo-vaginitis (42.9%) to be most commonly associated with vaginal discharge, followed by bacterial vaginosis (18.8%) and trichomonal vaginitis (4.4%). In a study by Rita Vora *et al.*, increasing trend of vulvo-vaginal candidiasis was observed from 2008 to 2015 (from 32.7 to 40.5%)^[4], findings similar to our study. The risk factors for vulvo-vaginal candidiasis includes pregnancy and using OCPs^[5]. This could be a reason of high prevalence in our study as many patients referred from Gynecology and obstetrics department during antenatal care. Self-medication of antibiotics and counter availability of topical antibacterial and antifungal creams along with increase in drug resistance of candida to antifungal agents adds to the burden with recurrent vulvo-vaginal candidiasis and multiple visits in STI clinic^[6].

In our study bacterial vaginosis was found as second leading because (18.8%) associated with vaginal discharge. In a study by Rita vora *et al.*, bacterial vaginosis was found associated in 8.1% cases of vaginal discharge. Low socioeconomic status has been found to be associated with bacterial vaginosis, as per various published studies^[7, 8]. In our hospital also a high proportion of female STI attendees come from low socio-economic group. Antibiotic combinations are commonly used for treatment, but these may not be able to cure all bacterial vaginosis cases^[9]. Incomplete treatment due to illiteracy, social stigma and discrimination among females may be a reason of recurrent bacterial vaginosis and high number of bacterial vaginosis cases in our hospital.

Trichomonas vaginitis was found associated with vaginal discharge in 4.45% of cases in our study. In previously published literatures, the prevalence in different parts of India varied from 0.4% to 27.4%.^[10] This is also well known that 50% of *Trichomonas vaginalis* infections are asymptomatic in women and in men also most of the times it is asymptomatic. Therefore, actual prevalence of Trichomonal vaginitis is largely unknown. In our study we didn't find any specific trend from 2014 to 2018.

Herpes genitalis was found to be the most common 1212 (3.2%) among ulcerative STIs. Prevalence of Herpes genitalis in STD clinic attendees ranged from 2.3% to 32.8% in various published studies from different parts of India. Diagnosis was made on the basis of clinical presentation, which was confirmed by PCR if required. The continual presence of Herpes infection is due to the emergence of viral STIs which keep reoccurring and resistance to acyclovir, a well-known entity particularly in immune-compromised patients^[11]. Heavy menstrual flow, fever and trauma were documented as most common triggering factors for recurrence in patients of herpes genitalis. Once again low socioeconomic group were found more frequently associated with chronic recurrent herpes genitalis.

Chancroid has been reported less in our STI center as compare to other centers. Total 33(0.087%) cases were confirmed on the bases of clinical appearance and Gram's staining for *Hemophilus ducreyi*. In a review by Camila *et al.*, of 14 studies after the year 2000, a sustained declined is observed in proportion of genital ulcer disease caused by *H. ducreyi*^[12]. In a study from a rural-based tertiary health-care

center in Gujarat, declining trend was observed of genital ulcer disease including *Hemophilus ducreyi* infection from 2008 to 2015. Also, Donovanosis and lympho-granuloma venereum were not seen from 2014 to 2018 in our study. Our findings are similar to findings of studies at Rohtak, Imphal, and Kottayam^[13, 14].

In previously published medical literatures genital warts have been reported in 2-25% of STD clinic attendees in India.^[15] In a recent study by Khopkar US, Rajagopalan M, *et al.* Overall genital wart prevalence in India was estimated at 1.07% with higher prevalence in Delhi (2.17%) and least in Bangalore (0.40%)^[16]. In our study we reported 3% of all STD attendees with a statistically significant ($P=0.0001$) increase in the number of genital wart cases from 2014 to 2018. The sexually active and fertile age group (25-44 years) was found more frequently affected with genital warts. Changes in sexual habits, multiple sex partners and high risk sexual practices may be responsible for increased number of cases of genital warts. As there is no specific antiviral treatment and the because of the association of high risk HPV genotypes with genital and other malignancies (give reference), HPV vaccination should be encouraged especially in areas of high prevalence. New treatment strategies are required to combat the recurrence of genital warts.

In contrast to other previously published studies, gonococcal urethritis cases were reported significantly less in our study. This declining trend in occurrence of gonococcal urethritis is quoted in previous published literatures^[17]. Ritu Vora *et al.* reported gonococcal urethritis incidence 1.8% in a study conducted at tertiary care center of Gujarat from January 2008 to December 2015. An exhaustive review of past 25 years of published literature by Devinder Mohan Thappa *et al* also reported decreasing trend of gonococcal urethritis in Indian perspective. In our study gonococcal urethritis, 170(0.45%); outnumbered non-gonococcal urethritis 135(0.35%). The ratio calculated (1.25:1.0). This is in contrast to other studies where non-gonococcal urethritis is more prevalent as compare to gonococcal urethritis. As Safdar Jung hospital is national reference center for Gonococcus, diagnosis is made on the bases of both clinical presentation as well as culture and biochemical tests for identification of *N. gonorrhoeae* assuring full quality control checking or by PCR testing following manufacturer instructions provided with the kit. Those urethral discharge cases which were not found positive for Gonococcus were reported as non-gonococcal urethritis. Further if specimen was found positive for gonococcus either by culture or PCR it was reported as gonococcal urethritis, irrespective of possible mixed infection. Antibiotic susceptibility testing was done following standard guidelines and resistance to antibiotics was reported. As Safdar Jung hospital is reference center for STIs with facilities for detection and isolation, many patients of treatment failure are referred to Safdar Jung hospital. This referral along with better quality detection facilities at our centre may be a reason of high number of cases of gonococcal urethritis as compare to other causes of urethritis.

In our study, we reported more number of syphilis cases as compare to other studies. Overall 2.2% cases reported after laboratory testing. All reactive samples by VDRL test were further confirmed by confirmatory test (TPHA). A significant rising trend is observed from 2014 to 2018. In a seven year study by Rita Vora *et al.* at a rural hospital of

Gujrat the overall prevalence calculated 1.5%. In another study from a tertiary care hospital of Delhi from 2001 to 2009, the VDRL reactivity calculated was 1.95% although specific tests of syphilis were not done [18]. Delhi being capital of India with people from different states, reflects an estimate of the prevalence of syphilis in the country. As the reactivity of VDRL test in late syphilis is ~70%, in our study we tested the patient's serum to confirm the diagnosis of late syphilis following standard guidelines if suspected clinically. In addition being state reference laboratory of HIV many patients are referred from different ICTC/PPTCT/BB centers, in whom the samples were also tested for VDRL reactivity as per guidelines of NACO.

Conclusion

The increasing awareness in society, availability of trained medical staff and antibiotic resulted in decrease in bacterial vaginosis and other bacterial STIs. But changes in human sexual behavior, high risk sexual practices and irrational use of antibiotics, has resulted in increased number of cases of viral and fungal sexually transmitted infections. A rising trend of syphilis is observed in our study and it is recommended to perform specific tests of syphilis if indicated clinically for determining the actual prevalence.

Conflicts of interest-None

Source of Funding-None

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