

## Original Research Article

# Microbiological profile of patients attending sexually transmitted infection/reproductive tract infection clinic in a tertiary care hospital

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### ABSTRACT

**Background:** Sexually transmitted infections (STIs)/reproductive tract infections (RTIs) are an important public health problem worldwide. Growing spread of RTIs/STIs are an augmenting factor for HIV transmission. Due to lack of adequate laboratory infrastructure, there is limited data. Hence information regarding STIs lies essentially on syndromic basis.

**Methods:** This was an observational, cross-sectional study carried from June 2016 to September 2016 with sample size of 300 patients attending STI/RTI clinic. Various samples were collected like scrapings, exudates and swabs from ulcerative lesions for microscopy. Urethral, vaginal and cervical swabs for wet mount, gram stain and culture. Blood sample were collected for RPR, TPHA, ELISA HSV II, HIV, HBsAg. Processing and identification of organism as per NACO guidelines.

**Results:** Out of total 300 cases, 255 (85%) are females and 45 (15%) are males. Maximum cases are from 25-44 years age group. Genital discharge syndrome is more common in females while genital ulcerative syndrome more in males. Coinfection with HIV is found in 17% cases. Herpes genitals (20%) is the most common causative agent for ulcerative STIs in males. VDS is the most common syndrome in Females. *Candida* (27.8%), *G. vaginalis* (12.2%) and *T. vaginalis* (3.5%).

**Conclusions:** Viral and fungal STIs are more common than bacterial STIs. Targeted intervention and contact tracing as done for HIV should be effectively emphasised for STI/RTI also. Syndromic approach should be supplemented by Laboratory diagnosis for more effective outcome.

**Keywords:** RTI, STI, Syndromic diagnosis

### INTRODUCTION

Sexually transmitted infections (STIs)/reproductive tract infections (RTIs) are an important public health problem worldwide. World health organization reported 340 million new cases of STIs/RTIs out of which 75-85% occur in developing countries.<sup>1</sup> In India, 40 million new cases emerge each year. Growing spread of RTIs/STIs is

an augmenting factor for HIV transmission. Due to lack of adequate laboratory infrastructure, there is limited data. Hence, information regarding STIs lies essentially on syndromic basis.<sup>2</sup>

Serious complications like post abortal and puerperal sepsis, ectopic pregnancy, foetal and perinatal death, infertility, chronic physical pain, cervical cancer, emotional distress and social rejection occurs if these

STIs are untreated. World health organization (WHO) had advised syndromic approach for case measurement and management<sup>1</sup>. Advantages of Syndromic management are that patients are treated at once, inexpensive and easy to understand. But there are some limitations also i.e. we can miss asymptomatic and mixed infections, overtreatment or under treatment of patients, side-effects of the drugs and antibiotic resistance. Laboratory diagnosis though time consuming and laborious, has many advantages like screening of high risks, generation of epidemiological data, sentinel surveillance, accurate etiological diagnosis and antimicrobial resistance testing of the isolates.<sup>3</sup>

Keeping above facts in mind, the present study was undertaken with an aim to study the microbiological profile of patients attending STI/RTI clinic attendees of the tertiary care hospital and to compare the performance of syndromic management against their laboratory diagnosis.

## METHODS

It was an observational, cross-sectional study carried from June 2016 to December 2016. A total of 300 patients attending STI/RTI clinic of a tertiary health care centre were included in the study with one or more complaints as enunciated by WHO in its syndromic approach for the diagnosis of STIs.<sup>1</sup> Various samples were collected as per the syndromic diagnosis.<sup>1</sup> Scraping from the bottom of the ulcer of genito-ulcerative disease herpetic (GUD-H) for Tzanck smear, exudates from genito-ulcerative disease non-herpetic (GUD-NH) for microscopy. Two swabs were collected from urethra in urethral discharge syndrome (UDS), vaginal swabs in vaginal discharge syndrome (VDS) and endocervical swabs in cervical discharge syndrome (CDS) each for wet mount, gram stain and culture respectively. Sterile pure viscous swabs from Hi-Media were used to collect the sample. Samples were immediately transferred to microbiology laboratory for further processing. All the specimens were collected and processed for culture and identification as per the standard guidelines given by NACO.<sup>4</sup> Five milliliters venous blood (without anticoagulant) was collected aseptically from the patients. Sera were separated and stored at -20-degree celcius in screw-capped plastic vials. Rapid plasma reagin (RPR) test was performed in patients having ulcerative syndromes for syphilis. RPR reactive were confirmed by Treponema pallidum hemagglutination assay (TPHA) from RSTRRL, GMC, Nagpur. ELISA was done for Herpes simplex II IgM antibody. All the cases were subjected to HIV I and II testing and HBsAg testing to rule out hepatitis B virus (HBV). All the serological tests were performed as per manufacturer's instructions. Genital warts (GW) and molluscum contagiosum (MC) were diagnosed clinically.

## RESULTS

A total of 300 syndromic cases from the STI/RTI clinic attendees of a tertiary health care centre were included in the study from June to December 2016. These 300 attendees presented with one or more of the complaints as enunciated by WHO in its syndromic approach for the diagnosis of STI.<sup>1</sup> Sex-wise distribution of 300 syndromic cases showed that 45 (15%) were males and 255 (85%) females. Age-wise distribution of total cases showed that maximum cases belong to age group 25-44 years (Figure 1).

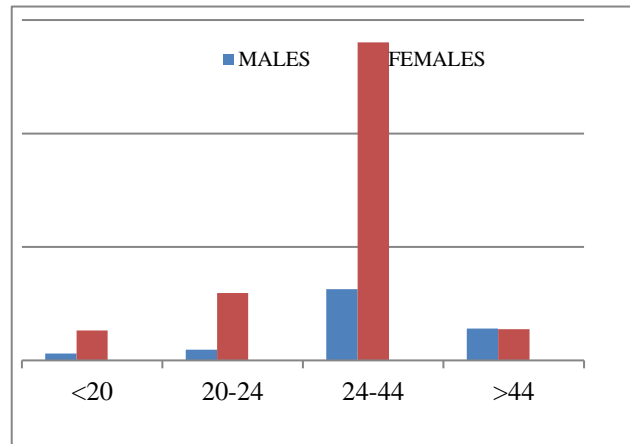


Figure 1: Age and sex wise distribution.

Out of 300 syndromic cases, 6 (2%) cases of GUD NH, GUD-H-32 (10.7%), UDS-1 (0.3%), VDS-233 (77.7%), CDS-11 (3.7%), GW-10 (3.3%), MC-7 (2.3%) were present (Table 1).

Comparison of syndromic approach and laboratory confirmed STIs showed that out of total 300 syndromic cases, GUD herpetic (32 cases) was the most common ulcerative syndrome and VDS (233 cases) was the commonest discharge syndrome. In above cases, lab confirmed cases of herpes were 11 (34.4%) and in females suffering from VDS, only 111 cases (47.6%) were confirmed for pathogens in laboratory. Hundred percent laboratory confirmations were seen in UDS case and 50% in GUD NH cases. In total, 127 cases (42.3%) were confirmed in laboratory for pathogens (Table 1).

Microbiological profile of syndromic cases showed that *herpes genitales* (20%) was the commonest pathogen causing STI in males followed by *T. pallidum* (4.4%) and *N. gonorrhoeae* (2.2%). In females, *Candida spp.* 71 (27.8%) was the commonest pathogen followed by *Trichomonas vaginalis* in 9 (3.5%), and *Gardenella vaginalis* in 31 (12.2%) (Table 2). Coinfection of STIs with HIV was seen in 17 % cases and with hepatitis B virus, it was found to be in 2.6% (Table 2).

**Table 1: Syndromic diagnosis of STI/RTI patients.**

Syndromes	Males (%)	Females (%)	Total (%)	Lab confirmed
GUD NH	4 (8.9)	2 (0.8)	6 (2)	3 (50)
GUD H	28 (62.2)	4 (1.6)	32 (10.7)	11 (34.4)
UDS	1 (2.2)	0 (0)	1 (0.3)	1 (100)
VDS	-	233 (91.4)	233 (77.7)	111 (47.6)
CDS	-	11 (4.3)	11(3.7)	1 (9.1)
GW	7 (15.6)	3 (1.2)	10 (3.3)	*
MC	5 (11.1)	2 (0.8)	7 (2.3)	*
	45	255	300	127

**Table 2: Microbiological profile of STI/RTI patients.**

Etiological Agent	Males-45 (%)	Females-255(%)	Total-300 (%)
<i>T. pallidum</i>	2 (4.4)	1 (0.4)	3 (1.0)
<i>Herpes II virus</i>	9 (20)	2 (0.8)	11 (1.7)
<i>N. gonorrhoeae</i>	1 (2.2)	1 (0.4)	2 (0.7)
<i>T. vaginalis</i>	-	9 (3.5)	9 (3)
<i>Candida spp.</i>	-	71 (27.8)	71 (23.7)
<i>G. vaginalis</i>	-	31 (12.2)	31 (10.3)
<i>H. ducreyi</i>	0	0	0
<i>C. granulomatis</i>	0	0	0
<i>Human immunodeficiency virus-1</i>	12(26.7)	39 (15.3)	51 (17)
<i>Hepatitis B virus</i>	4 (8.9)	4 (1.6)	8 (2.6)

## DISCUSSION

STIs/RTIs are an important public health problem. Epidemiological data over this is still limited in Indian scenario due to the scarcity of information and paucity of laboratory facilities. Social stigma, lack of knowledge, gender discrimination, unavailability of resources and many more reasons are the responsible factors for continuous increase in incidence of these infections. Though NACO has validated the syndromic management of these cases in Suraksha clinics, but the increasing drug resistance and risk of spread of HIV cannot be neglected. This necessitates immensely to have an in-depth study on the prevalent STIs for the STI prevention and control strategy under the national AIDS program.

In the present study, maximum cases were from 25-44 yrs which is the sexually active group and at a high risk of behaviourally more vulnerable to STI acquisition.<sup>2</sup> Females (85%) were more in number than males (15%) , which is in comparison with Ganju et al and Choudhary.<sup>2,5</sup> Increased number of female attendees may be contributed to improving female literacy rate, betterment of facilities at Suraksha clinic and media awareness campaigns.<sup>2</sup> Low percentage of male attendees may be due to social stigma, reluctance due to fear and guilt, easy availability of antibiotics from pharmacists and self-treatment.<sup>5</sup>

Genital discharge syndrome (VDS+CDS+UD) was more common in females (81.7%) while genital ulcerative syndrome (GUD-H, GUD-NH) more in males (12.7%). Tankhiwale et al reported similar findings showing 96.7% GDS and 6.34% GUD.<sup>6</sup> Choudhary et al have little variable findings showing almost equal percentage i.e. 39% GDS and 30% GUD.<sup>5</sup> In present study, coinfection of STIs with HIV was found in 17% cases. Thomas et al reported seroprevalence of HIV as 21% which is almost comparable to the study.<sup>7</sup> This is a matter of concern as genital ulcers facilitates the transmission of and enhance susceptibility to HIV infection by sexual contact. Also, genital discharge like gonorrhoeae, chlamydia trachomatis and trichomonas vaginalis increases the shedding of HIV virus in genital tract by recruiting HIV infected inflammatory cells as part of normal host response.<sup>5</sup> Other studies have variable findings. Choudhary et al reported 10.3% whereas Ganju et al reported only 1.3% of HIV coinfection in STI clinic attendees.<sup>2,5</sup> This variability in HIV coinfection may be due to the regional variation and prevalence of HIV in an area.

In current study, coinfection of STIs with Hepatitis B virus was seen in 2.6% cases. Choudhary et al showed 6% cases with HBV coinfection.<sup>5</sup> Risbud et al reported a very high percentage (43.3%) of HBV coinfection.<sup>8</sup> But this may be because of variability of study population (68.8% were males with high risk behavior and 15.9% were female sexual workers) and the diagnostics tests

(ELISA for HBsAg, anti-HBs and anti-HBc) used for confirmation of HBV were more sensitive and specific.

*Herpes genitalis* (20%) was the most common causative agent for ulcerative STIs in males. *T. pallidum* was confirmed only in 2 males (4.4%). There is no case of *H. ducreyi* and *C. granulomatis* in the ulcerative disorders. Our findings are highly matching with Devi et al who reported HSV in 19.3% males, *T. Pallidum* in 7.3% with no case of *H. ducreyi* and *C. granulomatis*.<sup>9</sup> This suggest the rising incidence of viral STIs because of increased usage of antibiotics.<sup>5</sup>

Vaginal discharge syndrome is the most common syndrome in females in present study. Vagina has a variety of normal flora and any alteration in behaviour leads to infection. In this study, *Candida* (27.8%) was the commonest isolate from VDS followed by *G. vaginalis* (12.2%) and *T. vaginalis* (3.5%). Tankhiwale et al reported 23.9% of *Candida sp.* followed by 9.7% BV and 3.3% TV.<sup>6</sup> Okonko et al reported 27% of *Candida sp.* followed by 10.5% BV and 1.5% TV.<sup>10</sup> Both the studies are comparable with that of ours showing fungal STI to be commonest ones. Indiscriminate use of antifungal agents for the gynaecological use may be responsible for this surge of fungal STIs.<sup>5</sup> *Candida albicans* (55%) is the commonest species followed by *C. parapsilosis* (26.1%) and *C. tropicalis* (11.6%) in this study. More recently, non albicans *Candida* (NAC) species have been recovered with increasing frequency which are known for their variable resistance to azoles. Hence, speciation of candida isolates is essential in routine specimen processing. Study results are in favour with Dodaiah et al.<sup>11</sup>

In current study, we found genital warts in 10 cases (3.3%). Several studies have reported increase in incidence of genital warts (7.6-25.2%) whereas Ganju et al reported only 0.68%.<sup>2,9,12</sup> The reason for these variable results probably lies in the study design, data source and computational method. The data presented by this study is from STI clinics of tertiary care hospital. Molluscum contagiosum was clinically diagnosed in 7 (2.3%) cases. Choudhry et al reported slightly higher percentage of this condition i.e. 4.7% but we have highly comparable results with Devi et al (2.76%).<sup>5,9</sup> The variation noted may be due to the hygienic habits and socioeconomic status of study population.<sup>6</sup>

In present study, only one case (9.1%) of cervical discharge syndrome was diagnosed with *N. gonorrhoeae*. Chlamydia trachomatis is reported to be the leading cause of cervicitis in females. A study from Chennai have reported very high percentage i.e. 30.8% of *C. trachomatis* in cervical discharge whereas Malhotra et al reported 19.1%.<sup>13,14</sup> These studies have used direct fluorescent antibody and ELISA Ag detection for Chlamydia which are not available at centre which may be responsible for missing the diagnosis of cervical discharge syndrome and *C. trachomatis*. Overall, viral

and fungal STIs are more common than bacterial STIs which is found by most of the studies may be due to overuse of broad spectrum antibiotics.<sup>2,5,9</sup>

Syndromic validation was done in 300 cases who received some or the other kit from the counsellor. Laboratory confirmation was done in 127/300 cases (42.3%). Other Studies which shows the comparable results are Okonko et al (39%), Tankhiwale et al (37.5%).<sup>6,10</sup> Are we underdiagnosing the cases by microbiological confirmation which could lead to treatment failures and spread of disease or we are over diagnosing by syndromic approach and contributing to increased drug resistance. A study in Himachal Pradesh reported syndromic management to be highly efficacious whereas study in Delhi found some shortcomings in syndromic algorithms and specified a need of periodic review.<sup>2,5</sup>

## CONCLUSION

To conclude, viral and fungal STIs are becoming common than bacterial STIs. There are more chances of an individual to acquire or transmit HIV and other Viral STIs. Targeted intervention and contact tracing as done for HIV should be effectively emphasized for STI/RTI also. Syndromic approach should be supplemented by laboratory diagnosis for more effective outcome. Syndromic algorithms need to be periodically reviewed in this era of increasing antibiotic resistance. Placement of a skilled technician at every tertiary care centre in Suraksha clinic should be highly emphasized for increasing the effectiveness of syndromic approach by microbiological diagnosis.

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