SEROPREVALENCE OF HSV, HBsAg & HCV IN STD CLINIC ATTENDEES OF A TERTIARY CARE STATE HEADQUARTERS HOSPITAL

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ABSTRACT

BACKGROUND

Sexual activity in humans is meant for both procreative and recreational purposes. However, with the discovery of HIV/AIDS in 1981, concerns developed worldwide over unprotected sex. The unprotected sexual activity is contributing for transmission of symptomatic and asymptomatic STIs such as HIV, HBsAg and HCV.

The aim is to study seroprevalence of HBsAg, HSV & anti-HCV antibodies in STD clinic attendees of Osmania Medical College/Osmania General Hospital, Hyderabad.

MATERIALS AND METHODS

It is a descriptive study (observational study) conducted from January 2015 – December 2015 at STD Clinic OPD. A total of 3,583 patients who attended the STD Clinic during the above period were studied and patients having direct or indirect risk factors were serotested for the 3 viral infections after inclusion and exclusion criteria with informed consent. A 5 mL of venous blood is collected and the separated serum is tested for HSV 1&2, HBsAg and Anti-HCV antibodies by using ELISA kits. It is ensured that the test kits used have >95% sensitivity and specificity.

Settings & Design- All eligible patients attending STD Clinic, Dept. of DVL, Osmania Medical College/Osmania General Hospital, Hyderabad were included in the study after inclusion and exclusion criteria with informed consent. A consecutive sampling methodology with zero intervals is followed. A percentage analysis method is used to derive the conclusions.

RESULTS

A total of 473 cases are found to be seropositives out of the 3,583 STD clinic attendees for either of 3 STIs showing a seroprevalence of 13.20%, in which male seroprevalence is 13.56% (258 cases) and female seroprevalence is 12.80% (215 cases). In the studied population of 3583, 412 cases were seropositives for HSV Antibodies with seroprevalence of 11.5%, 39 were HBsAg Antibodies positive with seroprevalence of 1.09% and 22 cases were positive for HCV antibodies with seroprevalence of 0.61%. The seropositivity in males and females respectively for HSV is 11.56% and 11.43%; for HBsAg is 1.26% and 0.89%; for HCV is 0.74% and 0.48%. The illiterates (376 of 473=79.49%) and people of low socioeconomic status (371 of 473=78%) are more affected. While 234 of 258 men are having either Premarital, Extramarital or combination accounting to 90.70%, 176 of 215 (81.86%) women are confined to marital sex.

CONCLUSION

The awareness on STIs needs to be well informed before the start of the sexual activity by incorporating the STI/RTI education in school and college curriculum, through IEC activities like mass media campaigns, print & electronic media, by using local cultural festivals, gatherings and through marriage institutions. The at-risk populations such as Sex workers, MSM & IDUs should be covered through specific targeted interventions by utilising NGOs, local bodies and associations.

KEYWORDS

Herpes Simplex Virus Type 1, Herpes Simplex Virus Type 2, Hepatitis B Virus, HSV 1, HSV 2, Anti-HCV Antibodies, Sexually Transmitted Viral Infections, STD Clinic, STD Clinic Attendees.

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BACKGROUND

The Sexually Transmitted Diseases/Infections are caused by bacteria, virus, fungus and ectoparasites. The National AIDS Control Organisation (NACO), Government of India estimates that, the STI/RTI prevalence in the reproductive population is about 6%.¹ Of late, it is reported that, the viral STIs are increasing in numbers. The transmission risk of HIV is increased by 4-10 times in the presence of other STIs/RTIs.

Five hepatitis viruses (hepatitis A to E) are the leading causes of liver disease worldwide. Among them, hepatitis B virus (HBV) is responsible for approximately 350 million

chronic infections worldwide and over one million annual deaths, mostly as a result of end-stage liver disease and liver cancer.²

At the present time, viral hepatitis is a major health problem worldwide, particularly in Asian countries. Hepatitis is caused by different hepatic viruses and it leads to chronic liver disease and leads to increased morbidity and mortality.

Hepatitis B Virus (HBV)

The hepatitis B virus (HBV) is noncytopathic, hepatotropic members of the hepadnavirus (HBV) families that cause acute and chronic necroinflammatory liver disease and hepatocellular carcinoma (HCC).³ It is associated with viral hepatitis B and its presence in body fluids like semen, vaginal secretions and saliva, demonstrates its transmission not only via blood but also by sexual contact.

Hepatitis C Virus (HCV)

HCV is a single-stranded RNA, enveloped virus that belongs to Flaviviridae family. Globally, an estimated 71 million people have chronic hepatitis C infection. A significant number of those who are chronically infected will develop cirrhosis or liver cancer. Approximately, 399000 people die each year from hepatitis C, mostly from cirrhosis and hepatocellular carcinoma.⁴

HBV along with the hepatitis C virus (HCV) can cause broad-spectrum diseases such as hepatitis, fibrosis, cirrhosis and hepatocellular carcinoma (HCC) in the setting of chronic infection.² The predominant modes of transmission are by blood, blood products, injecting drugs and sexual transmission in high-risk populations.⁵

Herpes Simplex Virus 1 & 2

Herpes simplex viruses (HSVs) are DNA viruses that cause acute skin infections and present as grouped vesicles on an erythematous base. Most infections are recurrent and tend to reappear at or near the same location. Herpes labialis is the most common infection caused by HSV type 1 (HSV-1), whereas genital herpes is usually caused by HSV type 2. The prevalence of HSV-1 infection has been found to be higher than that of HSV-2 infection in most geographic areas.⁶

In this scenario, the present study was undertaken to estimate the seroprevalence of Herpes Simplex Virus (HSV), HbsAg & Anti-HCV antibodies infections in patients attending STD clinic OPD, Dept. of DVL, Osmania Medical College/Osmania General Hospital, Hyderabad from January 2015 to October 2015. This is a tertiary care Govt. Medical College Hospital located in the state headquarters i.e., Hyderabad of Telangana State, India.

Aims and Objectives

Gender

Sl. No.	Indicator/ Disease	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Total No. of Cases who attended STD OPD (Denominator)	1903	53.11	1680	46.89	3583	100
2	Total No. of Cases seropositives for either of 3 infections	258	13.56	215	12.80	473	13.20
3	HSV-1 Positive	124	6.52	116	6.90	240	6.70
4	HSV-2 Positive	108	5.68	88	5.24	196	5.47
5	Both HSV-1 & 2 Positive	12	0.63	12	0.71	24	0.67
6	HSV Total Positive (3+4-5)	220	11.56	192	11.43	412	11.50
7	HBsAg Positive	24	1.26	15	0.89	39	1.09
8	HCV Positive	14	0.74	8	0.48	22	0.61

Table 1. Gender wise Seropositivity (seroprevalence) against Total Clinical Attendees

To study seroprevalence of HBsAg, HSV & anti-HCV antibodies in patients attending STD Clinic, Dept. Of DVL, Osmania Medical College/Osmania General Hospital, Hyderabad.

MATERIALS AND METHODS

It is a descriptive study (observational study) conducted between January 2015 – December 2015 at STD Clinic OPD, Dept. of DVL, Osmania General Hospital, Hyderabad. A total of 3,583 patients who attended the STD Clinic were studied and patients with direct or indirect risk factors were serotested for the 3 viral infections.

Inclusion Criteria

All patients in reproductive age group attending STD clinic with the direct and/or indirect sexual risk history and those who are willing for investigation under this study were included after taking informed consent.

Exclusion Criteria

Already known seropositives for HIV, Herpes, Hepatitis B, Hepatitis C, H/o HBV vaccine, H/o blood transfusion and patients not willing for study were excluded.

Following parameters are noted on entry into study: Detailed personal and sexual history of the patient and the spouse, cutaneous & reproductive tract examination, blood investigations (ELISA is done for diagnosing Hepatitis B & C and Herpes virus 1&2) performed. The demographic details includes: Age, Gender, Literacy status, marital status, socioeconomic status.

Procedure

5 mL of venous blood was aseptically drawn from antecubital vein of the participants into a plain bottle and was allowed to clot at room temperature; the blood was spun for 5 minutes at 2500 rpm in a centrifuge to obtain serum. The serum obtained was tested for HBsAg, HCV antibodies, Herpes simplex virus 1&2 using Diaspot rapid diagnostic test strip and a third generation ELISA kit. The data obtained is calculated in percentage method.

RESULTS

A total number of 3,583 cases attended the STD Clinic OPD during the present study period from January 2015 to October 2015. A total of 473 (13.20%) cases are found to be seropositives for either of 3 STIs with seroprevalence of 13.20% in which male seroprevalence is 13.56% (258 cases) and female seroprevalence is 12.80% (215 cases). No single STD clinic attendee is positive for all 3 STIs.

In the studied population of 3583, 412 cases were seropositives for HSV Antibodies with seroprevalence of 11.5%, 39 were HBsAg Antibodies positive with seroprevalence of 1.09% and 22 cases were positive for HCV antibodies with seroprevalence of 0.61%. The seropositivity in males and females respectively for HSV is 11.56% and 11.43%; for HBsAg is 1.26% and 0.89%; for HCV is 0.74% and 0.48%.

Sl. No.	Indicator/Disease	Total	Male		Females	
			No.	%	No.	%
1	Total no of Cases attended STD OPD	3583	1903	53.11	1680	46.89
2	No. of seropositives for either of 3 infections	473	258	54.55	215	45.45
3	HSV-1 Positive	240	124	51.67	116	48.33
4	HSV-2 Positive	196	108	55.10	88	44.90
5	Both HSV-1 & HSV-2 Positive	24	12	50.00	12	50.00
6	HSV Total Positive (3+4-5)	412	220	53.40	192	46.60
7	HBsAg Positive	39	24	61.54	15	38.46
8	HCV Positive	22	14	63.64	8	36.36

Table 2. Gender Distribution among Seropositives

Of the total 473 seropositives, the male positivity is 258 (54.55%) and female positivity is 215 (45.45%). All 3 STIs such as HSV, HBsAg and HCV have shown more prevalence in males than in females viz., 53.4:46.60, 61.54:38.46 and 63.64:36.36 respectively.

STI	Total	18-20 Years		21-30 Years		31-40 Years		41-50 Years		>50 Years	
		No.	%	No.	%	No.	%	No.	%	No.	%
HSV-1	240	80	33.33	78	32.5	49	20.42	28	11.67	5	2.08
HSV-2	196	12	6.12	79	40.31	82	41.84	17	8.67	6	3.06
HSV-1 & 2	24	0	0	3	12.5	9	37.5	7	29.17	5	20.83
Total HSV	412	92	22.33	154	37.38	122	29.61	38	9.22	6	1.46
HbsAg	39	0	0	22	56.41	7	17.95	7	17.95	3	7.69
HCV	22	0	0	0	0	10	45.45	7	31.82	5	22.73
Total	473	92	19.45	176	37.21	139	29.39	52	10.99	14	2.96

Table 3. Age Distribution

In the present study, 92 (19.45%) cases are below 20 years, 367 (77.58%) cases are in between 21-50 years age. While no HBsAg and HCV are seen in early years of sexual activity (18-20 Years), all 3 STIs are seen in more than 31 years age group indicating that the longer the duration of sexual activity, higher the risk of acquiring asymptomatic STIs.

STI	Total	Illiterate		Literate	
		No.	%	No.	%
HSV-1	240	164	68.33	76	31.67
HSV-2	196	146	74.49	50	25.51
HSV-1 & 2	24	18	75	6	25
Total HSV	412	292	70.87	120	29.13
HBsAg	39	28	71.79	11	28.21
HCV	22	18	81.82	4	18.18
Total	473	348	73.57	135	28.54

Table 4. Literacy Rate Among Positive Cases

In the present study, literacy of the STD clinic attendees played a crucial role in transmission of STIs. The illiterates are more affected (348/473=73.57%) when compared to the literates (135/473=28.54%). The illiterates are at risk of participating in unprotected sex with the casual/regular partners, if the partner is asymptomatic at the time of sexual encounter, under the assumption that 'No genital lesions -No STIs'.

STI	Total	Single		Married		Widow		Widower	
		No.	%	No.	%	No.	%	No.	%
HSV-1	240	50	20.83	183	76.25	7	2.92	0	0
HSV-2	196	31	15.82	154	78.57	11	5.61	0	0
HSV-1 & 2	24	8	33.33	9	37.5	7	29.17	0	0
Total HSV	412	73	17.72	328	79.61	11	2.67	0	0
HbsAg	39	26	66.67	10	25.64	2	5.13	1	2.56
HCV	22	0	0	17	77.27	4	18.18	1	4.55
Total	473	99	20.93	355	75.05	17	3.59	2	0.42

Table 5. Marital Status Among Positive Cases

In the present study of 473 seropositives, 99 patients (20.93%) are unmarried and the remaining 374 patients (79.07%) are married and either living with the partner or widow (er). From the statistics, it appears the marriage is one influencing factor in transmission of infection to their regular partner, but the infected clients are failed to establish 'when and how' they got the infection i.e., pre or post-marital acquisition.

Socioeconomic Status

In the present study of 473 seropositives, 372 (78.65%) are from lower socioeconomic group and 101 (21.35%) are from

middle socioeconomic group. The same higher prevalence is seen in lower socioeconomic group across all 3 infections.

There were zero cases from higher socioeconomic group. It can be attributed that the affluent society may be taking treatment for infections from private sector to avoid stigma of getting the services from Government Hospitals.

Sexual Behaviour & Practices

In the present study of 473 seropositives, 386 (81.40%) cases are heterosexuals (Males=171, 44.4%; Females=215, 55.8%) while 87 (18.60%) cases being homosexuals. The same pattern is seen in across all 3 infections.

Gender & Behaviour	Total	Premarital Exposure		Confined to Marital Sex		Extramarital Exposure		Both Pre & Extramarital Exposures	
		No.	%	No.	%	No.	%	No.	%
Men	258	144	55.81	24	9.30	64	24.81	26	10.08
Women	215	16	7.44	176	81.86	21	9.77	2	0.93
Total	473	160	33.83	200	42.28	85	17.97	28	5.92

Table 6. Marital & Extramarital Exposures

It is observed that 176 of 215 (81.86%) women are confined to marital sex while this behaviour is seen in 24 of 258 (9.30%) men only. The 234 of 258 men are having either Premarital sex, Extramarital sex or combination accounting to 90.70%, whereas this behaviour is seen in 39 of 215 (18.13%) women only. It depicts that the women are more at risk of acquiring infection from the spouse. In 144 men with premarital exposures, 104 (72.22%) are single and 40 (27.77) are married men. The longer the years of single status in men, more the risk of indulging in premarital sexual experimentation and higher risk of exposures.

Condom Usage

Though all men used condom at least once in their life, 100% condom usage in all pre and extramarital encounters is not practised by any male participant. The usage of condom is influenced by availability of condom, personal and partner willingness, time and place of sexual activity and presence of visible genital lesions. In 215 women, 176 married women occasionally used condom to avoid pregnancy, as a hygienic measure during menstrual sex. 39 women with either of pre, extra and both also not used 100% condom in all sexual encounters. This study emphasises once again on importance of 100% condom usage in all sexual encounters.

DISCUSSION

The present study is conducted on 3583 STD Clinic attendees between January 2015 to December 2015. A total of 473 patients were found seropositives for either of 3 STIs with seroprevalence of 13.20%. Various risk factors like Age, gender, literacy, socioeconomic studies, marital status and sexual behaviour were considered.

Prevalence

In the present study, prevalence of HSV positive cases was 11.5% with HSV-1 6.7% and HSV-2 5.5%. These results were found to be comparable with 13% in Cusini M et al study group.⁷

Prevalence of HBsAg positive cases in the present study was 1.08%. Prevalence of Anti-HCV antibodies positive cases in the present study was 0.61%. This is comparable with

Tripathi PC et al, where in Seropositivity for HBsAg was 1.69% whereas HCV seropositivity was 0.4%. A higher seroprevalence of HBsAg and HCV was found in males as compared with females.⁸

Gender

Overall in the present study, there is male preponderance.

Among HSV positive cases in the present study, male to female ratio was 1.14:1 with male predominance. These results were found to be consistent with that of 1.2:1 of V P Amudha et al study groups.⁹

Among HBsAg positive cases in the present study, male to female ratio was 1.7:1 with male predominance. These results were found to be comparable with that of 1.9:1 of Tripathi PC et al study.⁸

Among HCV positive cases in the present study, male to female ratio was 1.7:1 with male predominance. These results were found to be comparable with that of 2:1 of Antala. S.K et al study groups.¹⁰

Age-wise Distribution

Overall in the present study, most cases belonged to 21-30 yrs. and 31-40 yrs. age group.

Among HSV positive cases in the present study, the prevalence of 22.3% in 18-20 yrs., 37.4% in 21-30 yrs., 29.6% in 31-40 yrs. and 10.7% in more than 41 yrs. were found to be comparable with that of J S Smith et al study prevalence of 14.3%, 45.2%, 28.5% and 12% respectively.

Among HBsAg positive cases in the present study, the prevalence of 56.4% in 21-30 yrs., 17.9% in 31-40 yrs. and 17.9% in more than 41-50 yrs. and 7.8% in more than 50 yrs. were found to be comparable with that of Jafar et al with 56.5%, 19.6%, 17.4% and 6.5% respectively.¹¹

Among HCV positive cases in the present study, the prevalence of 45.5% in 31-40 yrs. and 31.8% in 41-50 yrs. and 22.7% in more than 50 yrs. were found to be comparable with that of Jafar et al with 43%, 30.7%, 26.3% respectively.¹¹

Literacy

Among HSV positive cases in the present study, most of the cases were illiterates constituting 70.9% of total to the

literate 29.10%. These findings were found to be comparable with that of 72%:28% of Chawla et al study groups.¹²

Among HBsAg positive cases in the present study, most of the cases were illiterates constituting 71.8%. These findings were found to be comparable with that of 65.5% of Fawad Khan et al study groups.¹³

Among HCV positive cases in the present study, most of the cases were illiterates constituting 81.8% compared to literates 18.2%. These findings were found to be comparable with that of 76.2%:23.4% of Rajesh N Gacche et al¹⁴ and 72.4%:27.6% of A.N.Elzouki et al study group.¹⁵

Marital Status

Among HSV positive cases in the present study, most of the cases were married 79.6% constituting more than half, followed by single 17.7% (unmarried) and widow(er) 2.7%. These findings were found to be consistent with that of V P Amudha et al⁹ study groups with 77.2%, 15% and 7.8% respectively.

Among HBsAg positive cases in the present study, most of the cases were singles with 66.7%, followed by married with 25.6% and combination of widow(er) with 7.7%. These findings were found to be consistent with Roshandel Gholamreza et al study with 69% and 31% respectively.¹⁶

Among HCV positive cases in the present study, most of the cases were married constituting 77.3%, followed by widow(er) with 22.7%. These findings were found to be consistent with Zamani F et al study with 76.8% and 20% respectively.¹⁷

Socioeconomic Status

Among HSV positive cases in the present study, the 78.6% are from lower socioeconomic status followed by 21.4% in middle socioeconomic status. These findings were found to be consistent with V P Amudha et al study group with 69% and 26%.⁹

Among HBsAg positive cases in the present study, 74.3% cases were from lower socioeconomic status followed by 26.7% from middle socioeconomic status. These findings were found to be consistent with Fawad Khan et al study groups with 71% and 29% respectively.¹³

Among HCV positive cases in the present study, 86.3% cases were from lower socioeconomic status followed by 13.7% in middle socioeconomic status. These findings were found to be consistent with Erin Gower et al study of 79% and 13.7%.¹⁸

Sexual Behaviour

Among HSV positive cases in the present study, most cases were heterosexuals, followed by homosexuals. These findings were found to be comparable with that of van de Laar MJ et al study group where in a strong independent association with the presence of HSV-2 antibodies was found for sexual behaviour, more specifically homosexual orientation, increasing number of years of sexual activity, increasing number of lifetime partners, number of past gonococcal infections, having receptive anal and (or) vaginal contact.¹⁹

Among HBsAg positive cases in the present study, most cases were heterosexuals, followed by homosexuals. These findings were found to be comparable with that of Ledy HS Oliveira et al study where in 95.4% related to have

heterosexual life style and 3.6% were homo/bisexuals. However, 10.5% of the patients reported past homosexual relation.²⁰

Among HCV positive cases in the present study, majority were heterosexuals. These findings were found to be comparable with that of M Rotily et al study groups.²¹ Our study shows inconsistent condom use is the main cause for transmission of these 3 viral STIs.

Advantages of the Present Study

- 1) The present study provides comprehensive estimation of HSV, HBsAg & HCV prevalence in patients attending STD clinic in OMC & OGH.
- 2) Proper counselling and early diagnosis and treatment will reduce complications/morbidity & mortality and decrease fresh infections in the community.
- 3) Changes in sexual practices & improved screening measures will reduce the risk of transmitted infections.

Limitations of the Present Study

- 1) Duration of the study is of short duration.
- 2) Prevalence of HBV, HCV & HSV in patients attending STD clinic may not be a true reflection of total prevalence in the community. Broader studies are needed with large cohorts to estimate the prevalence of these infections in the community.

CONCLUSION

A total of 3,583 patients attending STD Clinic, Dept. of Dermatology, Venereology & Leprology (DVL) were studied. A seroprevalence of 13.20% is seen for either of 3 STIs with male seroprevalence of 13.56% and female seroprevalence of 12.80%. The seroprevalence for HSV, HBsAg and HCV is 11.5%, 1.09% and 0.61% respectively. The gender based seropositivity in males and females for HSV is 11.56% and 11.43%; for HBsAg is 1.26% and 0.89%; for HCV is 0.74% and 0.48% respectively. The illiterates (376 of 473=79.49%) and people from Low socioeconomic status (371 of 473=78%) are more affected. While 234 of 258 men are having either of Premarital, Extramarital or combination accounting to 90.70%, 176 of 215 (81.86%) women are confined to marital sex. It is observed that the risk of HSV, HBsAg & HCV is increased with increasing sexual years and unprotected sex with multiple partners during pre and extramarital sex.

In this scenario, the awareness on STIs needs to be well informed before the start of the sexual activity by incorporating the STI/RTI education in school and college curriculum, through IEC activities like mass media campaigns, print & electronic media, by using local cultural festivals, gatherings & through marriage institutions. The at risk populations such as Sex workers, MSM & IDUs should be covered through specific targeted interventions by utilising NGOs, local bodies and associations.

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