

## STUDY OF EPIDEMIOLOGICAL MARKERS AND SEROPREVALENCE OF HBV, HCV & HIV IN STI CLINIC ATTENDEES.

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### HOW TO CITE THIS ARTICLE:

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**ABSTRACT: BACKGROUND:** Hepatitis B virus (HBV) and Hepatitis C virus (HCV) share common route of infection and have high degree of epidemiological similarity with respect to high risk groups with human immunodeficiency virus (HIV). These conditions are linked with sexually transmitted infections but very less documentation is available regarding HBV and HCV infection in STI patients from this region. **METHOD:** A total of 278 clinically suspected cases of Sexually Transmitted Infection (STI) patients attending STI clinic were studied for seroprevalence of HBV, HCV and HIV along with age and sex matched healthy controls. Their age, sex, occupation and literacy level were also studied. **RESULTS:** The most common age group seeking medical advice belonged to sexually active group (18-40 years). Labourers showed highest prevalence of HBsAg (26.02%), HIV (10.04%) and HCV (5.42%). Higher prevalence of HBsAg (20.16%) and HIV (9.67%) seen in patients having only primary education. Seroprevalence of HBsAg, HIV and anti HCV Ab was 14.38%, 7.55% and 3.23% respectively in STI patients particularly more in ulcerative type whereas in controls their prevalence was 2.87%, 1.07% and 0.35% respectively. **CONCLUSION:** The present study showed that high prevalence of HBsAg, HIV and HCV is associated with male sex, low educational status and syndromic type of associated STI. An interesting finding is that seroprevalence of HCV is more in ulcerative STI similar to HBV and HIV. It suggests that sexual route of transmission of HCV is likely specially if there is breach in continuity of mucosal surface.

**KEY WORD:** HBV, HCV, HIV, STI clinic attendees, epidemiological markers.

**BACKGROUND:** Sexually transmitted infections (STIs) are more dynamic than other infections prevailing in the community. In India during 1960s and 70s, bacterial infections such as syphilis, chancroid and gonorrhoea were major STIs. The spread of human immunodeficiency virus (HIV) with subsequent behavioral change since the 80s has resulted in significant alteration in epidemiological patterns. As in developed countries, there has been a significant rise in viral diseases and a relative fall in the incidence of traditional infections.<sup>[1]</sup>

Viral infections principally affecting liver, are among the sexually transmitted infections with highest incidence worldwide. Hepatitis B virus (HBV) and Hepatitis C virus (HCV) share common route of infection and have high degree of epidemiological similarity with respect to high risk groups with concomitant human immunodeficiency virus (HIV). As hepatopathic viral infections in HIV positive individuals are often chronic and sub clinical, and co-infection can lead to more aggressive liver disease, early screening of all high risk individuals for HBV and HCV, together with HIV screening, is necessary.<sup>[2]</sup>

These conditions are linked with sexually transmitted infections but very less documentation is available regarding HBV and HCV infection in STI patients from this region,

# ORIGINAL ARTICLE

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therefore the present study is undertaken to study the seroprevalence of HBV, HCV & HIV and their association with various epidemiological markers.

**METHODS:** A total of 278 clinically suspected cases of STI attending STI clinic were included in the study. Detailed history including age, sex, occupation, marital status, sexual history, past history (History of Hepatotoxic drugs intake, jaundice) was taken. Personal history (IV drug addiction or tattooing) was taken. A thorough general, systemic and local examination of all suspected STI patients was done.

## **Inclusion criteria:**

1. Willingness of patients.
2. History of high risk behavior like
  - Homosexuals
  - Multiple sexual partners.
3. Signs and symptoms of sexually transmitted infections, both local (ulcerative lesion, discharge, inguinal lymphadenopathy, etc) and systemic (e.g. fever, rash etc.)

## **Exclusion Criteria:**

1. Non willingness of patients.
2. H/O IV drug abuse
3. H/O multiple blood transfusion
4. H/O Haemodialysis / organ Transplantation.
5. ANC patients
6. In female patients with H/O caesarian section or other operative conditions.
7. Evidence of Tattooing
8. H/O acupuncture.

**Sample collection:** After brief counselling and informed written consent, 5ml of blood was withdrawn with all aseptic precautions, collected in a sterile bulb without anticoagulant. Serum is separated and stored at -20°C. Serum samples were processed for HBsAg, anti HCV Ab and HIV detection using following kits.

1. HBsAg: Hepalisa from J. Mitra and Co. pvt Ltd.
2. Anti HCV Ab: Heparostika HCV ultra- Biomeriux from Beijing United Biomedical Co. Ltd, Beijing.
3. HIV Ab: Pareekshak rapid spot test, Rapid HIV card test, Combaid (HIV 1+2 immunoblot test kit) as per NACO's guidelines.

**RESULTS:** It is observed that out of 278 STI patients, maximum number of STI patients, 117 (42.08%) were in age group 29-39 years followed by, 18-28 years 97 (34.89%). Controls were age and sex matched (Table-1)

In the study group, Vaginal Candidiasis 69 (24.82%) and Bacterial vaginosis 66 (23.74%) accounted for the majority of STI. These were followed by Candidal Balanitis 59 (21.22%), Herpes progonitalis 25 (8.99%), Molluscum Contagiosum 11 (3.95%), Chlamydial Vaginitis 10 (3.59%) and

## ORIGINAL ARTICLE

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genital warts 9(3.23%). Traditional infections like syphilis and Gonorrhoea accounted for 9 (3.23%) and 6 (2.15%) respectively (Table-2).

Majority of the patients (256 - 92.08%) in the study group were married. This consisted of 95.95% female and 85.71% males. Eighteen (6.47%) patients were unmarried in which 14.01 % were males and 1.75% were females.

Out of HBsAg, HCV and HIV Ab, seroprevalence of HBsAg was most common followed by HIV and HCV. Seroprevalence of HBsAg, HIV and anti HCV Ab was 14.38%, 7.55% and 3.23% respectively in study group which was more than control group with the prevalence of was 2.87%, 1.07% and 0.35% respectively and the difference was statistically significant (Table-3).

Based on educational status, 278 study patients were divided into 5 groups. Out of them, maximum cases were in primary education group i.e. 108 (38.08%) followed by the non-matriculate group 105 (37.76%). It is observed that, HBsAg and HIV positivity was more in patients having Non primary/Primary/ Non- matriculate education. In case of anti HCV Ab, out of 9 patients, 8 patients were having primary or non- matriculate education.

Study of educational status showed that seropositivity of HBsAg, anti-HCV and HIV Ab is less in patients who are educated (Matriculate and graduate).

Occupation of the study group included CSW, driver, government job, housemaid, housewife, labourer, private job, and student. Majority of the patients were housewives 154 (55.39%) followed by labourers (26.25%). HBsAg and HIV Ab was more in labourers than in patients with other occupations, and the difference was statistically significant in case of HBsAg (p value=0.001).

Seroprevalence of HBsAg, HCV and HIV Ab was more in patients with high risk sexual behaviour and the statistical analysis by Chi<sup>2</sup> test shows that the difference is highly significant in case of HBsAg, HIV and significant in case of HCV Ab (Table-4). As for as correlation of these viral infections with syndromic type of STI is concern seroprevalence of HIV Ab and HBsAg was more in ulcerative than non ulcerative type of STIs, and the statistical analysis showed that the difference was highly significant (p value=0.0001) in HIV Ab and significant (p value=0.0481) in HBsAg. Percentage of Anti-HCV Ab was also more in ulcerative type of STIs, but the difference was not statistically significant because of less number of Anti-HCV positive patients (Table 5).

Out of 278 STI patients, HIV and HBV co-infection seen in 4 (1.43%), HIV and HCV co-infection seen in 2 (0.71%) and HBV and HCV co-infection is seen in 4 (1.43%). None had HBV, HIV and HCV triple co-infection. High risk sexual behaviour was found in all the HBV-HCV and HCV-HIV co-infected patients. While 3 out of 4 HBV and HIV co-infected patients gave the history of high risk sexual behaviour, and remaining one was housewife of spouse having history of high risk sexual behaviour.

**DISCUSSION:** Sexually transmitted infections (STIs) are the major public health problem in developing countries. Most of the STIs, both ulcerative and non-ulcerative are prevalent in India. Moreover the interest in STIs and their management have increased tremendously because of their proven role in facilitation of HIV infection which in turn also increases susceptibility to other STIs like HBV and HCV. [2]

In the present study, genital discharge cases were more common. Similar finding was seen in other studies. [3, 4]

## ORIGINAL ARTICLE

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Vaginal candidiasis 69 (24.82%) and bacterial vaginosis 66 (23.74%) accounted for the majority of STI cases in the present study. Similar finding is seen in study by Ray K et al, [5] in which *Candida albicans* was found to be the commonest etiological agent. But Bansal KN et al, 1988 [6], reported relatively higher incidence of chancroid (37.7%) than syphilis (32.4%), followed by gonorrhoea (24.7%) mixed infections (3.38%), donovanosis (1.1%) and lymphogranuloma venereum (0.3%) in 1093 STD cases.

The commonest STI varies in different studies. This variance could be due to different geographical regions besides different biological, environmental, cultural and socio-economic factors.

In the present study, out of 278 STI cases, most were in the 29-39 year age group followed by 18-28 years. Similar finding was reported in study by Thappa DM et al, 1999, where the mean age of the group was 29.8 years. [7] This is the sexually active group and at a high risk of behaviorally more vulnerable to STI acquisition. Being the economically productive group, there is a great loss of manpower at work due to STD morbidity, measured as Disability Adjusted Life Years (DALYs) lost. The finding of the present study was comparable with the other Indian study. [8,9] In the present study, male to female ratio was 0.6:1 which differ from a study in JIPMER, Pondicherry, South India by Thappa DM et al, 1999 noted male to female ratio of 3.63:1. [7] This may be due to the fact that majority of patient in present study are from gynaecology OPD.

Majority of patients in the study were married. History of high risk sexual behavior (HRB) was present in most of the males (66.35%). But majority of married women (23.39%) denied history of premarital or extramarital contacts. This stresses the fact that housewives were infected by their promiscuous husbands. Mohanty J et al in 1995 while studying the clinical profile of sexual transmitted diseases found that, most of the patients of his study were married. Friends and relatives were the next possible source of infection (19%). Most of the married women blamed their husband for the source of infection. [10]

Out of the 278 STI patients, HBsAg, HIV and anti HCV Ab was positive in 14.38%, 7.55% and 3.23% respectively which was more than control group where the prevalence was 2.87%, 1.07% and 0.35% respectively and the difference was statistically significant. Finding of seroprevalence of HBsAg is similar to other Indian study [11, 12, 13] whereas some found very low prevalence. [8, 14] This difference may be due to difference in test method used. As for as HCV Ab is concern, the similar finding like present study were shown by many others. [15,13] Very high prevalence was reported by Rai R et al which may be due to difference in test method as they used RNA detection test. [11]

Prevalence of STI, HBsAg, anti HCV Ab and HIV Ab in relation to educational status showed that these infections are more in patients with only primary education. This may be due to the fact that they are less aware about the mode of transmission and the preventive measures. The higher prevalence rates of HBV, HCV and HIV in the less educated have also been reported in other studies. [16, 11, 17]

Seroprevalence of HBsAg and HIV Ab was more in labourers than in patients with other occupations. The difference was statistically significant in case of HBsAg (OR=3.06, CI- 1.45-6.49, p-value=0.001). Due to low educational status in labourers, ignorance about the mode of transmission and preventive measures may be the reason for high prevalence of STI in labourers. Labourers were also the majority in various Indian studies. [18, 10]

# ORIGINAL ARTICLE

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In the present study, out of 278 STD patients, only 4 (1.43%) patients were CSWs. And all of them were negative for HBsAg, anti HCV Ab and HIV Ab. All of them were using barrier contraceptives that may be the reason of negativity.

Heterosexuality was the predominant sexual behaviour. High risk sexual behaviour (CSW, multiple sexual partners) was more in male and the difference was found to be statistically significant (OR=6.94, CI=3.91-12.37, p-value= 0.0001). This was similar to the finding reported by Rajesh R et al. [8] Seroprevalence of HBsAg, anti HCV Ab and HIV Ab was more in patients with high risk sexual behaviour. The statistical analysis showed the difference to be highly significant. This finding was similar to other study. [19]

Seroprevalence of HBsAg, anti-HCV Ab and HIV Ab was more in ulcerative type of STI than non ulcerative STIs. The difference was statistically significant in HBsAg and HIV Ab but not found significant in anti HCV Ab may be because of small number of HCV positive patients. This suggests that the mucosal discontinuity might predispose to sexual transmission of all the three viruses (HBV, HCV and HIV). This finding is similar to the many other studies. [7, 14,]

Co-infection of HIV and HBV seen in 4(1.43%), HIV and HCV co- infection seen in 2 (0.71%) and HBV and HCV co-infection is seen in 4 (1.43%). None had HBV, HIV and HCV triple co-infection. Co-infection finding were similar to the study by Jindal N et al [2] except for HIV and HCV co-infection which was higher. In his study HIV and HBV co-infection 2(1.3%), HIV and HCV 11(7.0%), HBV and HCV 2 (1.3%); HIV, HBV and HCV triple co-infection seen in 2(1.3%).

All these findings suggest that integrating hepatitis services into an STD clinic and field investigation program should better serve the needs of high risk clients, such as MSM and IDUs, and provide an opportunity for STD, HIV, and hepatitis prevention and control services to be delivered in an efficient and effective manner.

**CONCLUSION:** Present study shows higher prevalence of HBsAg, anti HCV Ab and HIV in STI patients suggesting the need of selective screening of these three blood born viruses.

Poor educational status was found to be associated with viral STIs (HBV, HCV and HIV), and an important epidemiological factor. The health education regarding the mode of transmission and their prevention by discouraging high risk behaviour, promotion of use of barrier contraceptives should be done. Prompt diagnosis and treatment of STDs based on syndromic approach will be definitely feasible at every health centre and will also help to prevent the transmission of HBV, HCV and HIV.

Considering the above facts regarding the higher prevalence of HBV, HCV and HIV in STI group with male predominance, high risk sexual behaviour and poor educational status, routine screening of these three diseases in STD clinic attendees along with health education regarding safe sexual practices and HBV vaccination should be adopted.

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## ORIGINAL ARTICLE

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# ORIGINAL ARTICLE

**Table- 1: Clinical diagnosis of study group (n= 278):**

Diagnosis	Total No. (%)
Vaginal Candidiasis	69 (24.82%)
Bacterial. Vaginosis	66 (23.74%)
Candidal Balanitis	59 (21.22%)
Chancroid	2 (0.71%)
Genital Chlamydiasis	10 (3.59%)
Donovanosis	2 (0.71%)
Genital warts	9 (3.23%)
Human Papilloma virus	25 (8.99%)
Genital Herpes	1 (0.35%)
Gonorrhoea	6 (2.15%)
Syphilis	9 (3.23%)
Molluscum Contagiosum	11 (3.95%)
Trichomonas vaginitis	8 (2.87%)
Condyloma acuminata	1 (0.35%)
<b>Total</b>	<b>278</b>

**Table-2: Age/Sex distribution of study (n=278) and control group:**

Age group (years)	Study group			Control group		
	Total	Male	Female	Total	Male	Female
18-28	97 (34.89%)	26	71	90 (32.37%)	30	60
29-39	117 (42.08%)	40	77	119 (42.80%)	40	79
40-50	56 (20.14%)	33	23	59 (21.22%)	34	25
>50	8 (2.87%)	6	2	10 (3.59%)	7	3
<b>Total</b>	<b>278</b>	<b>105 (37.76%)</b>	<b>173 (62.23%)</b>	<b>278</b>	<b>111 (39.92%)</b>	<b>167 (60.07%)</b>

# ORIGINAL ARTICLE

**Table-3: Seroprevalence of HBsAg, Anti HCV Ab and HIV Ab**

Age group	No. of patients	HBsAg		Anti HCV Ab		HIV Ab	
		Study	Control	Study	Control	Study	Control
18-28	97 (34.89%)	15 (15.46%)	5 (5.15%)	4 (4.12%)	0	5 (5.15%)	1
29-39	117 (42.08%)	15 (12.82%)	2 (1.7%)	3 (2.56%)	1	10 (8.54%)	2
40-50	56 (20.14%)	10 (1.75%)	0	2 (3.57%)	0	4 (7.14%)	0
>50	8 (2.87%)	0	1 (12.5)	0	0	2 (25%)	0
Total	278	40 (14.38%)	8 (2.87%)	9 (3.23%)	1 (0.35%)	21 (7.55%)	3 (1.07%)
<b>Test of significance</b>		chi2 = 23.35, df= 1, p value= 0.0001,		Fischer Exact test, p value= 0.02.		chi2=14.11, df=1, p value=0.0001	

**Table-4: Relation of HRB with HIV, HBV and HCV positivity**

HRB	HBsAg		Anti HCV Ab		HIV Ab	
	Positive	Negative	Positive	Negative	Positive	Negative
Positive 111 (39.92%)	26 (23.42%)	85 (76.576%)	7 (6.306%)	104 (38.66%)	19 (17.11%)	92 (35.79%)
Negative 167 (60.07%)	14 (8.38%)	153 (91.61)	2 (1.19%)	165 (61.33%)	2 (1.19%)	165 (64.20%)
278	40 (14.28%)	238 (85.61%)	9 (3.23%)	269 (96.76%)	21 (7.55%)	257 (92.44%)
<b>p- value</b>	<b>0.0005 (HS)</b>		<b>0.0184 (S)</b>		<b>0.0001 (HS)</b>	

**Table- 5: Syndromic Classification of STI:**

Syndromic classification	Total	HBsAg		HIV		HCV	
		+ve	-ve	+ve	-ve	+ve	-ve
Ulcerative	41 (14.78%)	10 (24.39%)	31 (75.6%)	11 (26.82%)	30 (73.17%)	3 (7.31%)	38 (92.68%)
Discharge + Others	237 (85.25%)	30 (12.65%)	207 (87.34%)	10 (4.21%)	227 (95.78%)	6 (2.53%)	231 (97.46%)
Total	278	40 (14.38%)	238 (85.61%)	21 (7.55%)	257 (92.44%)	9 (3.23%)	269 (96.76%)
<b>p-value</b>		<b>0.0481 (Significant)</b>		<b>0.0001 (HS)</b>		<b>Not significant</b>	



# ORIGINAL ARTICLE

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