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Original Research Article

Prevalence of HIV, Hepatitis-B, Hepatitis-C and Syphilis among the High Risk Individuals Attending Integrated Counselling and Testing Centre of a Tertiary Care Hospital

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Abstract:

Introduction: Sexually Transmitted Infections (STIs) are a significant cause of illness throughout the world. High-risk behaviours and routes of transmission for STIs such as Syphilis, Hepatitis B and Hepatitis C are identical with Human Immunodeficiency Virus (HIV). The shared transmission routes for HIV, HBV, HCV and Syphilis increase their co-existence rate in a single host. The study was aimed to assess the prevalence of HIV, Hepatitis B, Hepatitis C and Syphilis among the High-risk individuals attending Integrated Counselling and Testing Centre (ICTC).

Materials & Methods: 577 Blood samples were collected from High-risk individuals attending ICTC and tested for HIV, Hepatitis B surface Antigen (HBsAg), Antibody to HCV and Treponema pallidum Hemagglutination Assay (TPHA). Individuals visiting ICTC for pre-surgical screening, without any symptoms of STIs and without any history of exposure were excluded from the study.

Results: Out of 577 High-risk ICTC attendees, 4.5% (27), 2% (12), 0.8% (5) and 2.5% (14) of the study population were tested positive for HIV, HBsAg, Anti-HCV Antibodies and TPHA respectively. Out of these, 2 participants tested positive for both HIV and HBsAg and 1 positive for both HIV and Syphilis.

Conclusion: In the present study HIV showed high positivity rate compared to HBV, HCV and syphilis infections in high risk individuals. Because of shared routes of transmission co-infections seen with HIV-HBV and HIV-Syphilis. Therefore HIV cases should be routinely screened for other infections like HBV, HCV and Syphilis. Preventive measures to reduce HIV infection should include continuous monitoring of STIs in various groups of a given population.

Keywords: STIs, TPHA, Co-infection.

Introduction

Immune system of the body is affected in Human Immunodeficiency Virus (HIV) causing a break in normal defenses so that they are prone to major life-threatening diseases. Sexually transmitted infections (STIs) such as syphilis, hepatitis B virus (HBV), and hepatitis C virus (HCV) infections have same routes of transmission and high risk behaviour as that of HIV [1]. Sexually Transmitted Diseases (STDs) are major cause of public health problem and important cause of illness throughout the world [2]. Patient attending STD clinics, drug addiction centres and men who have sex with men (MSM) are high-risk populations in India. [3]

2-4 million people have co-infection with HBV whereas 4-5 million have HCV co-infection in patients infected with Human Immunodeficiency virus (HIV). Different factors like immune status of the patient, mode of transmission and age decides the severity of HBV and HCV infection. In HIV infected people one-third of deaths due to liver diseases occurs because of HBV and HCV co-infection. Because of co-infections survival rate is

decreasing and risk of liver disease is increasing. [4]

Decrease in CD4 count and increase in HIV1 RNA levels seen in HIV patients co-infected with Syphilis. Co-infected patients showed more syphilis treatment failures as compared to people who are not having HIV infection. [1]

STDs which cause ulcers and blood borne infections requires early diagnosis and treatment to prevent transmission of HIV. [3] The objective of this study is to assess the prevalence of HIV, Hepatitis B, Hepatitis C and Syphilis and also to assess their socio demographic characteristics among the High-risk individuals attending Integrated Counselling and Testing Centre of a tertiary care hospital.

Materials and Methods

The present study was done in the ICTC attached to the Department of Microbiology, Rangaraya Medical College, Kakinada, Andhra Pradesh

Study period: 6 months from October 2024 to March 2024.

Study population: 577 High-risk Individuals attending ICTC.

Study design: A Hospital based, Prospective, Cross-sectional study.

Inclusion criteria: High-risk groups like Female Sex Workers (FSW), Men who have sex with Men (MSM), Transgenders, IV drug abusers, People with symptoms of STIs, People with Multiple sexual partners.

Exclusion criteria: Individuals who did not come under High-risk groups and those who were visiting ICTC for screening purposes.

Relevant clinical history and socio-demographic details were collected from the study population during Pre-test Counselling. Under strict aseptic precautions, 5 ml of Blood was collected in a plain vacutainer (red) and Serum was separated by centrifugation. Samples were stored at -20^{0}C till tests were performed.

Serodiagnosis of HIV was performed using three commercially available rapid assays, each of different antigens or test principles. Kits used are 1. Comb Aids-RS HIV 1+2 Immunodot test kit by ARKRAY Healthcare Pvt. Ltd. [Figure 1] 2. HIV-1/2 Card Test (HIV Rapid Test Kit) by Bhat Bio-Tech India (P) Ltd.[Figure 2] 3. AIDSCAN HIV-1/2 Immunoconcentration Test kit by Bhat Bio-Tech India (P) Ltd.[Figure 3]. Interpretation was done as per the National AIDS Control Organization (NACO) HIV Testing strategies.

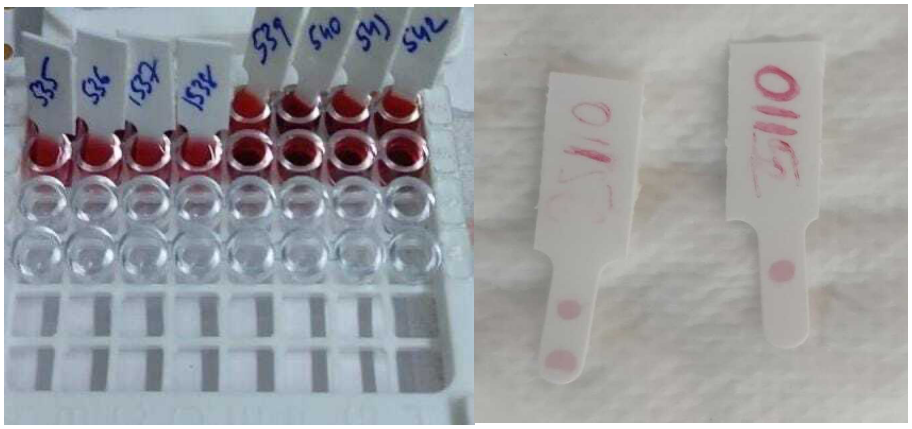

Figure 1: Dot Immunoassay and Comb test positive and negative.

Figure 2: HIV-1/2 ICT RDT showing HIV-1 Positivity

Figure 3: Tridot assay showing HIV-1 Positivity

Serodiagnosis of HBV was done by detection of HBsAg using @Sight HBsAg Rapid Test kit by Mediclone Biotech Pvt. Ltd.[Figure 4]. Serodiagnosis of HCV was done by detection of Anti-HCV Antibodies using Standard Q HCV Ab by SD Biosensor Healthcare Pvt. Ltd.[Figure 5]. Serodiagnosis of Syphilis was done by Treponema pallidum particle hemagglutination (TPHA) test using Bio-Rad's Syphilis agglutination screening assay kit - TPHA 200 Assay.[Figure 6].

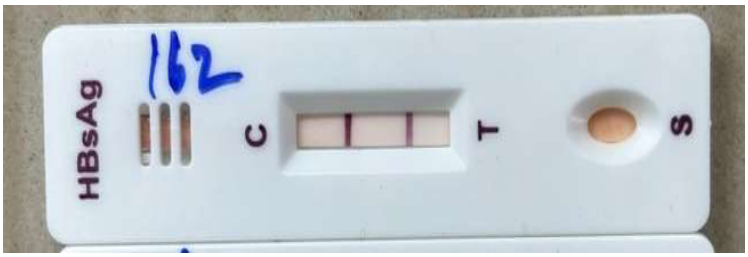

Figure 4: HBsAg RDT kit showing Positivity.

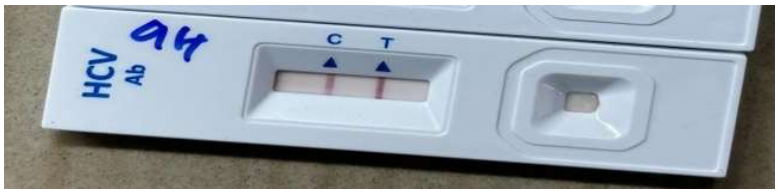

Figure 5: Anti-HCV Ab RDT kit showing Positivity.

Figure 6: TPHA kit and Cell pattern covering the bottom of the well indicating Test positivity

Statistical Analysis: Entry of data and analysis was done using SPSS version 16. Statistical significance of association between HIV status and age, gender, educational status, occupational status and marital status was determined by analyzing the data using Pearson's Chi-square test. Significance of difference in proportion of HIV positives among all categories was done and p value < 0.05 was considered statistically significant.

Results

Socio demographic characteristics of the study population was given in Table 1.

Table 1: Prevalence with respect to Sociodemographic characteristics of study population.

Sociodemographic Characteristics (n = 577)			HIV -1 27 (4.50%)	P value	HBsAg 12 (2%)	P value	Anti-HCV 5 (0.86%)	P value	TPHA 14 (2.50%)	P value
Age	**<40 years**	242	**12 (5%)**	**0.787**	4 (1%)	**0.541**	**2 (1%)**	**0.929**	3 (1%)	**0.115**
	>40 years	335	15 (4%)		**8 (2%)**		**3 (1%)**		**11 (3%)**	
Gender	**Female**	261	**18 (7%)**	**0.021**	**5 (2%)**	**0.801**	**4 (2%)**	**0.116**	**8 (3%)**	**0.364**
	Male	316	9 (3%)		**7 (2%)**		1 (1%)		6 (2%)	
Educational Status	**Above HS***	58	2 (3%)	**0.018**	**3 (5%)**	**0.037**	**1 (1%)**	**0.206**	2 (3%)	**0.198**
(*HS-High School)	**Below HS***	340	10 (3%)		3 (1%)		**1 (1%)**		5 (1%)	
	Illiterate	179	**15 (8%)**		6 (3%)		**3 (1%)**		**7 (4%)**	
Occupational Status	**Employed**	409	16 (4%)	**0.173**	7 (2%)	**0.333**	**3 (1%)**	**0.59**	**11 (3%)**	**0.521**
	Unemployed	168	**11(6%)**		**5 (3%)**		**2 (1%)**		3 (2%)	
Marital Status	**Unmarried/ Divorced/ Widow**	176	**19 (11%)**	**<0.00001**	**9 (5%)**	**0.0007**	**2 (1%)**	**0.643**	**9 (5%)**	**0.005**
	Married	401	8 (2%)		3 (1%)		**3 (1%)**		5 (1%)	

Below Figure 7 shows among 577 high risk individuals 27 (4.5%) were HIV-1 positive, 12 (2%) HBsAg, 5 (0.86%) anti HCV and 14 (2.5%) TPHA positive.

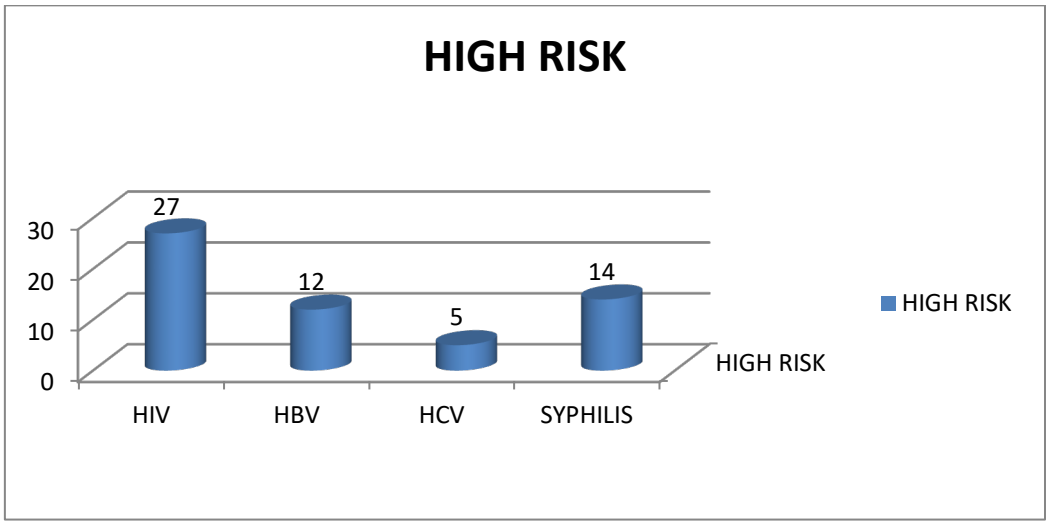

Figure 7: Prevalence of infections among high-risk individuals.

Majority of HIV positive cases were unmarried or divorced (11%), illeterates (8%), unemployed (6%), females (7%) and most of them below 40 years (5%) age group. Significant statistical associations were seen between HIV infection and illeterates, unmarried or divorced and females with p value < 0.05.

Hepatitis B, HCV and Syphilis infections were mostly seen in increased age group individuals >40 yrs. Significant association was seen among Hepatitis B, syphilis and unmarried or divorced individuals. Hepatitis B infection common in educated people (5%) which was statistically significant with p value 0.037. Nil significant difference was observed in the prevalence of Hepatitis C with respect to different Socio demographic characteristics.

Below Figure 8 shows HIV co infections seen with HBV, HCV and Syphilis. Out of 27 HIV positive cases two (7%) were co infected with HBV and one (3%) with Syphilis. No co-infection was seen with HCV.

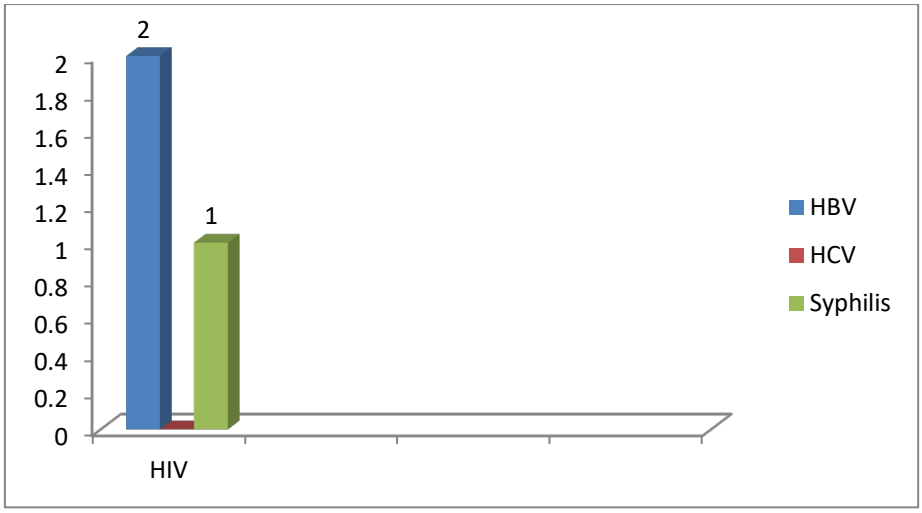

Figure 8: Prevalence of Co infections among HIV infected

Discussion:

The current study highlighted the prevalence of HIV, Hepatitis B, Hepatitis C and Syphilis among the High-risk individuals attending the ICTC of a tertiary care hospital in Andhra Pradesh.

In the present study most of the HIV infected people were below 40 years age group and illeterates which was correlating with Shreya et al [1]. Because most of the HIV infected were illeterates they may not aware of the safe sex practices and sexually transmitted diseases. Significant statistical association was seen between HIV and illiteracy (p value 0.018). Present study shows higher rate of HBV and syphilis cases in more than 40 years age group which was correlating with Shimelis et al [5]. Increasing rate of HBV with age may be due to with time risk of exposure to HBV infection increases [5]. Females are more affected than males in HIV, HBV, HCV and syphilis. Among them HIV infection with females is statistically significant (p value 0.021) whereas other infections were not significantly associated. HIV, HBV and Syphilis infections are more in unmarried or divorced or widow cases compared to married which was correlating with Luciano et al [2].

Prevalence of HIV-1, HBV, HCV and syphilis in high-risk individuals (n=577) in the present study was 4.5%, 2%, 0.8% and 2.5% with HIV being highest whereas T. Hussain et al showed 2.4%, 2.9%, 1.0% and 5.4% with syphilis showing highest rate. Positivity of HBV is high compared to HCV in our study and also other studies like T. Hussain et al. This may be due to poor vaccination for HBV infection as many vaccines available. Whereas prevalence of HCV is less because it spreads mainly through injections rather than sexual route. But sexual route of transmission is more common in India [6]. Proper vaccination for HBV infection should be done in all high-risk group individuals.

Co-infections are common among HIV, HBV, HCV and Syphilis because of same routes of transmission but it depends on some factors like age or time at which exposure occurs, rate of particular infection in the society, transmission risk behavior [5]. In the present study 7% co infection seen with HIV-HBV and 3% with HIV-Syphilis. But no co infection seen with HIV-HCV.

Similarly, T. Hussain et al showed co-infections with HIV-HBV, HBV-HCV and HIV-Syphilis and no co infection with HIV-HCV. Risk of acquiring HBV is more in patients with immunosuppression while HCV transmission is more common through percutaneous route [2]. Rate of co infections increases because of shared routes of transmission like homosexual contact in HBV, intravenous drug use in HCV [5].

Natural history and pathogenesis of these co-infections depend on the immunosuppression and progression of HIV cases. So high risk patients and HIV cases should be screened properly for HBV, HCV and Syphilis infections which helps in early diagnosis and treatment so that there will be decrease in spread of these infections. As sexual route is most common mode of transmission in our country 'behavior change communication' strategies should be implemented to reduce multiple sexual partners [1].

Conclusion

In the present study HIV showed high positivity rate compared to HBV, HCV and syphilis infections in high-risk individuals. Because of shared routes of transmission co-infections seen with HIV-HBV and HIV-Syphilis. Therefore, HIV cases should be routinely screened for other infections like HBV, HCV and Syphilis. Preventive measures to reduce HIV infection should include

continuous monitoring of STIs in various groups of a given population.

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