

ORIGINAL ARTICLE

SERO PREVALENCE OF HIV, HCV, HBV AND SYPHILIS (VRDL) IN TRANSGENDER MALE SEX WORKERS FROM RURAL, URBAN SINDH AND PUNJAB, PAKISTAN

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ABSTRACT

Objectives: Sexually transmitted infections (STIs) are among the most important health concerns in sex workers and the related key population because of the interaction of this community with general population and their spouses, as this group acts as a bridge between themselves and the people they come in intimate contact with. In Pakistan it can impact more profoundly because of lower literacy rate, poor personal and sexual hygiene. The estimated literacy rate of 62.3% for Sindh, 66.25 (both urban and rural) necessitates initiatives that focus public awareness programs research activities to further emphasize upon the magnitude of the problem.

Methods: A prospective study was conducted by infection control and prevention society of Pakistan to highlight the fact by evaluating the seroprevalence of HIV, HCV, HBV & VDRL in transgender, male sex workers (TGMSW) from different regions of Sindh and Punjab.

Results: During an 11 months period a total of 1198 TGMSW were assessed for the presence of HIV, HBV, HCV and VRDL from 1st January 2023 to 30th November 2023. Our findings with the limited data set has revealed a total of 139 (31%) test subjects to be positive for HIV, 113 (25%) individuals were found to be infected with HBV, 54 (12%) infected with HCV and 145 (32%) were found positive with VDRL. In addition to single infections, the study also examined the occurrence of coinfections. Results showed 9 individuals with HBV and HCV, 10 with HIV and Syphilis, and 4 with each combination: HIV-HCV and HIV-Syphilis. Only 1 case of HIV-HBV was observed.

Conclusion: The present study reports an overall incidence of HIV 31%, HBV 25%, HCV 12% and VDRL 32% which is suggestive of immediate need to further investigate these infections with large scale population-based study to reveal more accurate magnitude of the problem.

Keywords: Sexually Transmitted Infections (STIs), Human Immunodeficiency Virus (HIV), Hepatitis B virus (HBV) & Hepatitis C virus (HCV), Syphilis, Transgender Male Sex Workers (TGMSW)

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INTRODUCTION

Sexually Transmitted Infections (STIs) are infections that could occur from person to person via direct unprotected sexual contact or unhygienic sex with infected persons via vaginal, anal, and oral routes [1]. STIs are primarily spread by male, female and transgender sex workers or people who frequently have multiple partners. STIs remain a significant public health concern because of the associated serious health consequences such as infertility [2], adverse pregnancy outcomes [3], chances of various benign and malignant neoplasms involving genitals / pelvic organs and there is always a higher risk of acquiring Human Immunodeficiency Virus (HIV) along with other bacterial and viral STIs in adult population all around the world [4-6] the chances of acquiring STIs increases many fold in underdeveloped world due to lack of access to awareness related to personal hygiene and sexual health. Acquiring sexual gratification by having intimate contact with female and male sex workers or even transgenders is a persistent phenomenon in many parts of the world. In Pakistan sex before marriage or having multiple partners is usually considered uncommon but over a period of time people have become habituated. The lower literacy rate among sex workers is contributing to the rising incidence of STIs. The present study aimed to focus the magnitude of the problem by estimating the prevalence of the top four STIs namely HIV, Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Syphilis [7]. Among these four STIs, Human immunodeficiency virus HIV infection is of great concern. At the end of 2023 approximately 39.9 million people were living with HIV. This represents about 0.6% of adults aged 15 – 49 years worldwide. Among people living with HIV (PL-HIV) 630,000 died of HIV [8] . Globally syphilis remains a significant public health concern. In 2022, an estimated 8 million adults aged 15- 49 years acquired syphilis. Additionally, syphilis in pregnancy, if untreated or inadequately treated, leads to adverse pregnancy outcomes in 50- 80% of cases, including stillbirths and neonatal deaths [9].

Current data from 187 countries shows that viral hepatitis is a major public health challenge of this decade. An estimated 1.3 million people died from chronic viral hepatitis B and hepatitis C in 2022 which amounts to 3500 death/day [10, 11]. It has been recorded that almost 254 million are living with hepatitis B and another 50 million are infected as of 2022 worldwide. An alarming figure is of 6000 newly diagnosed cases every day worldwide [12]. Keeping in view these epidemiological figures, infection control society conducted this study from different cities of Sindh and Punjab provinces to find out the exact prevalence of these STIs.

METHODOLOGY

Ethical approval was obtained from Pakistan Medical Research Organization. Inclusion criteria involve male transgender sex workers, currently engaged in sex work for more than six months and age 14 - 60 years. Exclusion criteria involve diagnosis of cases of HIV, HBV, HCV, or Syphilis, persons taking antibiotics in last two weeks and severe acute illness, cognitive impairment. The study was conducted from January 1st to 30th November 2023 using snowball technique. Total of 1198 Transgender Male Sex Workers (TGMSW) were recruited and investigated for the presence of HIV, HBV, HCV or Syphilis. The whole blood sample was collected aseptically using vacutainer in 5 cc gel tube and centrifuged serum was separated and stored in 1.5 ml Cryogenic vials.

HIV Detection: Determine™ HIV-1/2 AG/AB combo was used for the detection of HIV 1/ 2 antigens that can identify four different antigen P17 p24 Gp120 and Gp41 while at the same time this system detected antibodies against all four antigens. Detection of HIV was based on a three-test strategy described by World Health Organizations (WHO) to avoid misdiagnosis of HIV as it has serious social and psychological implications. According to the three-test strategy, one must confirm using the three tests shown in the chart above to report any new HIV cases. To identify and report HIV infections, only a competent and trained staff person is allowed.

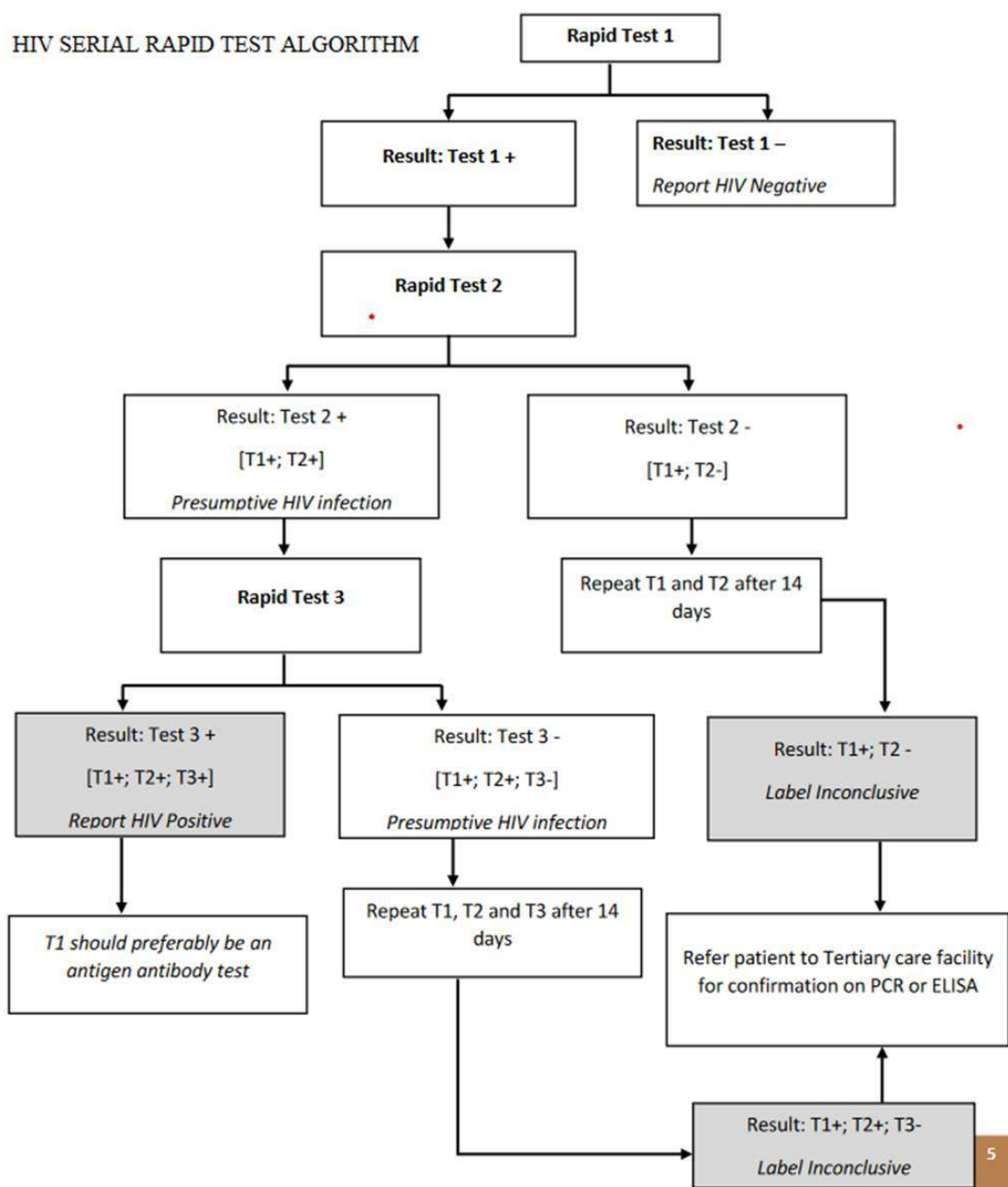


Figure: HIV Serial RAPID Tests Algorithm

The three-test strategy was used as a criterion to report HIV infections and only confirmed case of HIV were included in the present study. Hepatitis B Surface Antigen (HbsAg): Determine™ HbsAg2 (Abbot) was used for the detection of HbsAg as per instructions of the provider. Anti-Hepatitis C Virus Antibodies (Anti-HCV): Acon Anti-HCV antibody detection cassette was used to detect antibodies against HCV. VDRL detection: CTK biotech's Syphilis Ab Combo was used for Treponema pallidum (Tp) antibodies.

RESULTS

The observed frequency of STIs in different regions of the selected localities is summarized in Table 1. From a total of 1198 screened 145 (32%) were positive for VDRL. Mirpurkhas was found most effected region of Sindh as 28 cases out of 110 belong to that region. Second most affected area was Karachi with 22 positive cases out of 201 (15%) and while in Sangher the infectivity for syphilis was observed to be 10% as 15 out of 62 subjects were infected. The cumulative incidence HIV was 31% as 139 new cases out of 1198 were identified. Mirpurkhas was once again found to

take a lead in terms of infection as most HIV infected area is Mirpurkhas as 30 subjects out of 110 (22%) tested positive for HIV, secondly 14% positivity was from Karachi & Thar parker each where out of 205-19 & 105-19 were HIV infected respectively. While Tando Allah yar, Ghotki, Sangher and Hyderabad each contributed 6% where 36-8, 43-9, 62-9 and 59-9 individuals were positive respectively. The total identified cases of HBV were 113 out of 1196 (25%). The rate of infectivity in descending order is as follows: Thar parker 21 out of 105(25%), Karachi 15 out of 201(13%), Shirkarpur 14 out of 59(12%).

Table 1: Summary of STIs in Different Regions of the Selected Localities

SUMMARY										
Sr No.	City	Total Cases	HBsAg		HIV Antibody		HCV Ab		VDRL	
			Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
1	Badin	50	6	44	3	47	2	48	6	44
2	Dadu	85	2	83	5	80	4	81	6	79
3	Ghotki	43	0	43	9	34	0	43	5	38
4	Hyderabad	59	5	54	9	50	1	58	7	52
5	Jacobabad	1	0	1	1	0	0	1	1	0
6	Jamshoro	19	0	19	4	15	0	19	2	17
7	Kamber	14	2	12	0	14	2	12	1	13
8	Kandhkot	1	0	1	1	0	0	1	0	1
9	Karachi	201	15	186	19	182	5	196	22	179
10	kashmore	26	5	21	0	26	2	24	1	25
11	Khairpur	31	9	22	2	29	9	22	4	27
12	Larkana	20	2	18	0	20	2	18	0	20
13	Matlari	26	3	23	1	25	0	26	1	25
14	Mirpur	3	0	3	0	3	0	3	0	3
15	Mirpurkhas	110	7	103	30	80	3	107	28	82
16	N.Feroz	10	1	9	3	7	0	10	0	10
17	Okara	1	0	1	0	1	0	1	0	1
18	Pakpattan	4	0	4	0	4	0	4	0	4
19	Rawalakot	1	0	1	0	1	0	1	0	1
20	S.B.A	26	3	23	2	24	0	26	3	23
21	Sanghar	62	1	61	9	53	4	58	15	47
22	Sheikupura	31	0	31	1	30	0	31	0	31
23	Shikarpur	59	14	45	5	54	1	58	7	52
24	Sukkur	39	5	34	0	39	0	39	7	32
25	T.Allah Yar	36	4	32	8	28	5	31	5	31
26	T.M Khan	38	0	38	0	38	3	35	1	37
27	Tharparkar	105	21	84	19	86	7	98	11	94
28	Thatta	28	2	26	1	27	0	28	2	26
29	Umerkot	69	6	63	7	62	4	65	10	59
	TOTAL	1198	113	1085	139	1059	54	1144	145	1053

The distribution of HCV was overall 12% among the test subjects. Khairpur had the highest rate of infection whereas 09 subjects out of 31 tested positive (29%) followed by Tando Allahyar 5 out of 36 (14%) Thar parker 3 out of 38(13%) (table 1).

In addition to analyzing the prevalence of single infections, the current study also identifies the co-existence of all the four studied infectious agents and following bar chart is representing the co-infections (Figure 2). 10 cases of HIV were co-

infected with syphilis. Furthermore, syphilis co-infection with HCV was observed in a total number of 08 cases whereas each combination had a breakdown of 04 cases.

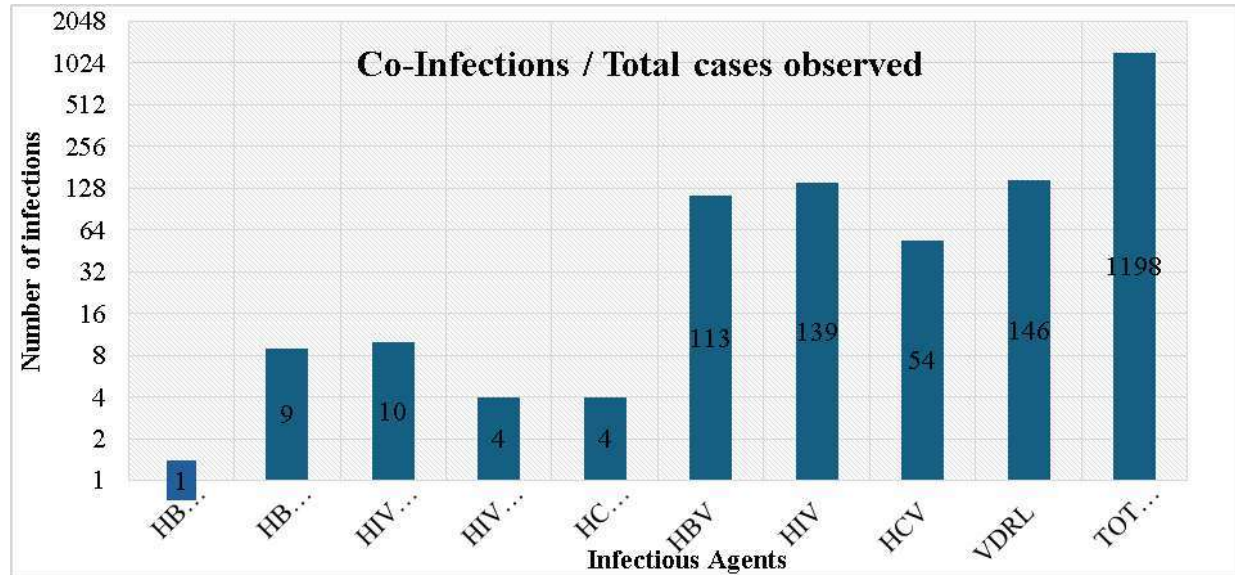


Figure 2: Co-existence of Infectious Agents

To establish the existence of significant positive or negative association in the context of age-related trends of infections, Chi-Square test was performed using SPSS version 26. Three different age groups were defined as 11-20, 21-30 and 31-40. Significant

positive association has been observed in both viral hepatitis B and C according to the statistics, signifying that the number of infections increases with advancing age whereas no relation has been observed for HIV and Syphilis (table 2).

Table 2: Age-related Trends of Infections

INFECTIONS	HCV	HIV	VDRL	HBV
Age Groups	% Pos.	% Pos.	% Pos.	% Pos.
1(11-20)	12.5%(11)	11.4%(10)	12.5% (11)	19.3(17)
2(21-30)	3.1% (23)	12%(88)	12.1% (89)	7.2(53)
3(30-40)	5.3 % (20)	10.9%(41)	12.2%(46)	11.4(43)
Total Count	4.5% (54)	11.%(139)	12.2%(146)	9.4(113)
P Values	0.001	0.854	0.995	0.001

DISCUSSIONS

The incidence of STDs among TGMSW was determined to be 32% Syphilis, 31% HIV, 25% Hepatitis B, and 12% Hepatitis C throughout selected areas of Sindh and Punjab. 1198 TGMSW were included to determine the presence of forementioned STIs. Large scale studies are required to fully disclose the actual incidence of STIs with reference to the exact population of transgenders in these cities as the present study only reveals data of the selected participants gathered using snowball technique, but anyhow computed statistics were sufficient to demonstrate the scope of this health issue. The top three affected regions in terms of syphilis infectivity were Mirpurkhas (19% positive), Karachi (15%), and Sangher (10%). However, a recent study that examined 1120 participants from four major Sindh cities Karachi, Hyderabad, Sukkar, and Larkana revealed that 96 (16.29%) of the 598 participants had syphilis, and 40 (6.79%) of those cases had syphilis coinfecting with HIV.[13]. A similar study involving five major areas of Sindh and Punjab observed an incidence of Syphilis even more lower (3.26%) in men who have sex with men (MSM) and transgenders, 82 out of 2531 (3.2%) were found to be infected [14]. Additionally, a different small-scale study that involved transgender sex workers discovered that 77 out of 208 (37%) of the participants had syphilis [15]. These discrepancies in observations strongly imply that the precise facts and statistics can only be revealed by a large-scale population-based study. It is possible to cure syphilis. It might be one of the causes of the observational fluctuations in the previously stated research.

According to the statistics of the study the Mirpurkhas was the most HIV-affected area (22%), Karachi and Tharparkar were next with 14% each, followed by Hyderabad, Ghotki, Sanger, and Tando Allahyar, with 6% each respectively. As per statistics of the 2020 Global AIDs monitoring report, 7.1% of transgender male sex workers from all over Pakistan had HIV infection, and a noteworthy increase has been noted in the number of HIV-related deaths [16]. With a small sample size, the current study has found that there is a

marked increased incidence of HIV in TGMSW from Sindh alone. A related study by the Punjab AIDS Control program focused on the prevalence of HIV, HBV, HCV and Syphilis among transgenders. It examined 1,562 transgenders and found 280 infected with HIV, 288 HCV positive cases, 600 cases of syphilis and 99 HBV infections. Further, this study discovered that out of 280 HIV-positive individuals 177 (63.2%) had co-infection with syphilis, 87 (31%) co-infected with HCV, and 47 (16.8%) co-infected with HBV [17]. Similar research conducted in Rawalpindi, Pakistan, with 306 transsexual men revealed a notably elevated prevalence of HIV1 as evidenced by PCR validation, revealing that 21.6% (Confidence Interval 0.17-0.26) of the participants were HIV positive [18]. Furthermore, a more recent study conducted on female sex workers (FSWs) from rural and urban Sindh revealed, 121 out of 5660 (2.1%) FSWs who were newly infected HIV [19]. Comparably, a recent meta-analysis of 25 studies from 11 different nations revealed that transgender women showed an overall positivity rate of 0% to 49.6% while transgender men showed an overall positivity rate of 0% to 8.3% [20]. Moreover, a meta-analysis conducted in the United States, combining information from eighty-eight studies revealed, HIV infection prevalence among transwomen and transmen were 14.1% and 3.2%, respectively [21]. In the present study the hepatitis B viral infection rates in the top three cities, Tharparkar, Karachi and Shirkarpur was 19%, 13%, and 12% respectively. The incidence of hepatitis C viral infections was highest in Khairpur at 17%, Tharparkar at 13%, while Karachi and Sanghar each had 9%. A study conducted in Rawalpindi, Pakistan, revealed an overall 25.5% incidence of HCV 78 out of 306 TGMSW, of them had HCV while 83 % of the individual claimed they had safe sexual activities [22].

RECOMMENDATIONS

The following measures are highly recommended.

- 1. Education and awareness:** We should conduct targeted awareness campaigns about sexually

transmitted infections (STIs) their transmission and prevention methods. Promote safe sex practices, including the consistent use of condoms.

2. **Access to healthcare:** Another approach is to have access to healthcare. Accessible healthcare facilities should be established, offering STI testing, treatment and counselling. Free or subsidized vaccinations for hepatitis B should be provided.
3. **Community engagement:** Collaborations with local organizations and community leaders can reduce stigma and discrimination. Trained healthcare providers can also offer non-judgmental and inclusive care.
4. **Behavioral interventions:** Peer education programs can be implemented to encourage healthy behavior within these communities. Harm reduction services for injectable drug users (IDUs) is also a sensible approach.
5. **Monitoring and research:** Conduct regular surveillance to trace infection rates and identify high risk areas. Invest in research to understand the unique challenges faced by these populations.

CONCLUSION

The purpose of this study was to evaluate the seroprevalence of HIV, HCV, HBV, and VDRL among TGMSW in different regions of Sindh, Pakistan. A sizable proportion of tested TGMSW were found infected with at least one as well as a few tested positives for dual infections. To address the spread of these infections a multifaceted approach is essential.

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Authors' Contribution

MR: Concept & design, statistical analysis, manuscript writing, responsible for integrity of research.

KJS, MU: data collection and manuscript writing
ST, KH: edited, review and final approval of manuscript

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