

Frequency of Human Immune Deficiency Virus (HIV) Infections at Tertiary Care Hospital of Karachi from 2017-2019

Fouzia Zeeshan Khan¹, Fatima Fasih¹, Samina Baig², Ambreen Fatima¹, Erum Bibi², Sahar Iqbal¹

¹Department of Pathology, Dow International Medical College, Dow University of Health Sciences (DUHS), Karachi,

²Microbiology Section, Dow Diagnostic Reference and Research Laboratory (DDRRL), Karachi, Pakistan.

ABSTRACT

Background: Human immunodeficiency virus (HIV) is the world's most serious health problem. Pakistan is included among high prevalent countries and two outbreaks of HIV have been reported one in 2018, in Sargodha (Kot Momin) and the other largest so far in 2019 in Larkana, first time infecting children as well. Therefore, a study was designed to find out the frequency as well as risk factors involved in the transmission of HIV.

Methods: This was a retrospective cross-sectional study (n=28,679), conducted in the Microbiology laboratory of Dow Diagnostic Reference and Research Laboratory (DDRRL), Karachi, Pakistan from 1st January 2017 to 31st December 2019. Serum samples were screened for the presence of HIV antigen and antibody by using HIV combo ARCHITECT i2000 SR, chemiluminescent immunoassay (CMIA). The Chi-square was used to analyze the data and a *p*-value of <0.05 was considered statistically significant.

Results: The total HIV-positive samples were 198 (0.69%). The mean age was 30.39 ± 10.1 with a predominance of males 158 (79.8%) followed by females 39 (19.7%) and trans-genders 1 (0.5%). The most prevalent ethnic background was Sindhi 40 (20.2%) followed by Urdu speaking 32 (16.2%). The major risk factors were sexual contact (25%) and surgical procedure (13%). The research found the highest incidence reported in Malir District (17.12%) followed by East (13.63%) and West (11.6%) of Karachi. The most significant association (*p*<0.001) of HIV was found with age.

Conclusion: The male population from the Malir district of Sindhi ethnicity had a high frequency of HIV. Moreover, sexual contact and surgical procedures were found major risk factors for HIV.

Keywords: Human Immunodeficiency Virus (HIV); Risk Factors; Sexually Transmitted Diseases; Epidemic.

Corresponding Author:

Dr. Fatima Fasih

Department of Pathology,
Dow International Medical College,
Dow University of Health Sciences (DUHS),
Karachi, Pakistan.

Email: fatima.fasih@duhs.edu.pk

ORCID iD: 0000-0002-3312-5809

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INTRODUCTION

Human immunodeficiency virus (HIV) is the world's most serious health problem. HIV causes acquired immunodeficiency syndrome¹. It adversely affects the human immune system and reduces CD4/T cells. These individuals are more susceptible to get opportunistic infections². HIV infection is transmitted through body fluids from HIV patients such as blood, breast milk and vaginal and semen secretions³. There are enduring myths that HIV can be transmitted through shaking hands, hugging, kissing, sharing personal objects, food or water, coughing/sneezing, sweat, sharing clothes, and through insects' bite⁴. Inadequate knowledge can lead to a misperception of disease among people. The first case of HIV was found 39 years ago in west-central Africa⁵.

According to global HIV and AIDS statistics, worldwide around 36.7 million individuals were infected with HIV in 2018. The HIV infection has spread in Pakistan all along, with an increasing number of deaths since 1987⁶. Pakistan is among the four countries in Asia, including Afghanistan, Bangladesh and the Philippines, where the predictable number of emerging HIV infections has been growing yearly since 1990⁷. There are many contributing factors, which impose a great challenge to healthcare clinicians to fight against HIV epidemic. Pakistan is a densely populated country with a low literacy rate. Lack of awareness regarding family planning, lack of contraceptive uses, increase in homosexuality, unchecked transfusion of blood and other body fluids, intravenous drug addiction and needle prick injury are the leading risk factors in spreading HIV/AIDS⁸. Moreover, inefficient sterilization practices during medical and surgical procedures as well as poor healthcare waste management systems are also important contributing factors to the spread of HIV infection⁹. Therefore, it is required to take precautions and immediate actions to limit the spread of HIV /AIDs in Pakistan. Moreover, a multifaceted approach should be adopted along with a substantial emphasis on education to fight against social obstruction and carelessness. This study aimed to assess the frequency of HIV and associated risk factors.

METHODS

This retrospective observational study (n=28,679) was

carried out in the Microbiology Section, Dow Diagnostic Reference, and Research Laboratory (DDRRL) from 1st January 2017 to 31st December 2019. The study was started after getting approval from the Institutional Review Board (IRB-176/DUHS/Approval/2020/) of Dow University of Health Sciences.

The non-parametric data of HIV screening were retrieved from the medical record (laboratory data software) of the Microbiology section. It included samples from different collection centers both within and outside the city. The sera of registered cases were screened for HIV combo by using ARCHITECT i2000 SR. The ARCHITECT HIV Ag/Ab Combo assay is a chemiluminescent immunoassay (CMIA) used for simultaneous detection of human immunodeficiency virus p24 antigen and antibodies to HIV-1 and HIV-2 in human serum and plasma. The presence or absence of HIV-1 p24 antigen or HIV-1/HIV-2 antibodies in the specimen is determined by comparing the chemiluminescent signals to the reaction cutoff signals determined from ARCHITECT Ag/Ab Combo calibration.

Samples with signals to cutoff values ≥ 1 were considered nonreactive. In the case of a positive sample, the patient's history was acquired along with a fresh sample for repeat testing. All HIV-positive sera were sent to the HIV Sindh referral laboratory for confirmation. The study included only all samples registered for detection of HIV infection irrespective of age and gender. The research excluded samples registered for repeat testing of HIV detection and having a lack of demographic information. The Statistical Package for Social Science (SPSS version 20) software was used for frequencies and percentages of demographics of positive cases. The Chi-square was used to analyze the data and a p-value of <0.05 was considered statistically significant.

RESULTS

Of the total 28,679 cases, 198 (0.69%) were HIV positive with a mean age of 30.39 ± 10.162 . The most affected age group was group 2 (Table 1). The majority were Pakistani with a predominance of males (79.8%). The most common ethnic group was Sindhi (20.2%) and Urdu speaking (16.2%).

Table 1: Distribution of human immunodeficiency virus (HIV) based on gender and age group of subjects.

Age Grouping	Negative n=28480		Positive n=198		p-Value
	Male n (%)	Female n (%)	Male n (%)	Female n (%)	
Group 1 (0-20 years)	1,261 (4.42%)	1229 (4.31%)	17 (0.05%)	4 (0.01%)	<0.001
Group 2 (21-40 years)	8,405 (29.51%)	11385 (39.97%)	119 (0.41%)	26 (0.09%)	
Group 3 (41-60 years)	2,946 (10.34%)	1609 (5.64%)	24 (0.08%)	9 (0.03%)	
Group 4 (>60 years)	950 (3.33%)	695 (2.44%)	0	0	

Among them, 121 (61.1%) were married. Affected cases belong to different professions including field workers, office employees, jobless individuals, domestic women and students (Table 2).

Table 2: Demographic characteristics of human immunodeficiency virus (HIV) positive cases with frequency and percentage distribution.

Categories	Frequency n (%)					
Gender	Male	Female	Transgender			
	158 (79.8)	39 (19.7)	1 (0.5)			
Marital Status	Single/Unmarried	Separation	Married	Second marriage	Widow	
	69 (34.8)	1 (0.5)	121 (61.1)	02 (1.0)	5 (2.5)	
Nationality	Pakistani		Afghani			
	195 (98)		03 (02)			
Ethnicity	Sindhi	Punjabi	Pashto	Seraiki	Memon	
	40 (20.2)	13 (6.56)	31 (15.6)	03 (1.5)	02 (1.0)	
	Urdu speaking	Afghani	Hindko	Balochi	Any other	
	32 (16.2)	03 (1.5)	01 (0.5)	17 (8.5)	56 (28.28)	
Profession	Office workers	Field workers	Jobless	House women	Student	Labor
	20 (10)	99 (50)	18 (9.09)	19 (9.6)	11 (5.5)	31 (15.65)

The highest risk factor was sexual contact (25.25%) (Figure 1). This study population belonged to various districts, including Central, East, Malar, South, West, and Korangi and 79 were from outside the Karachi city (Figure 2).

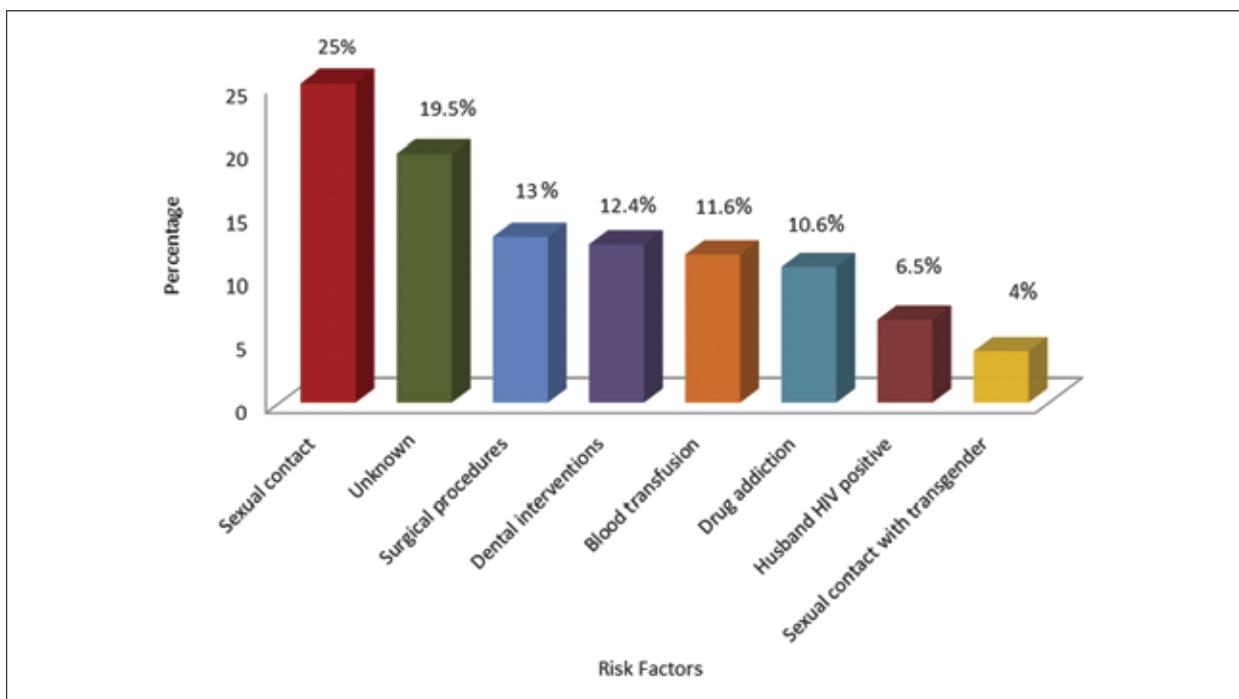


Figure 1: Risk factors reported in the human immunodeficiency virus (HIV) positive cases.

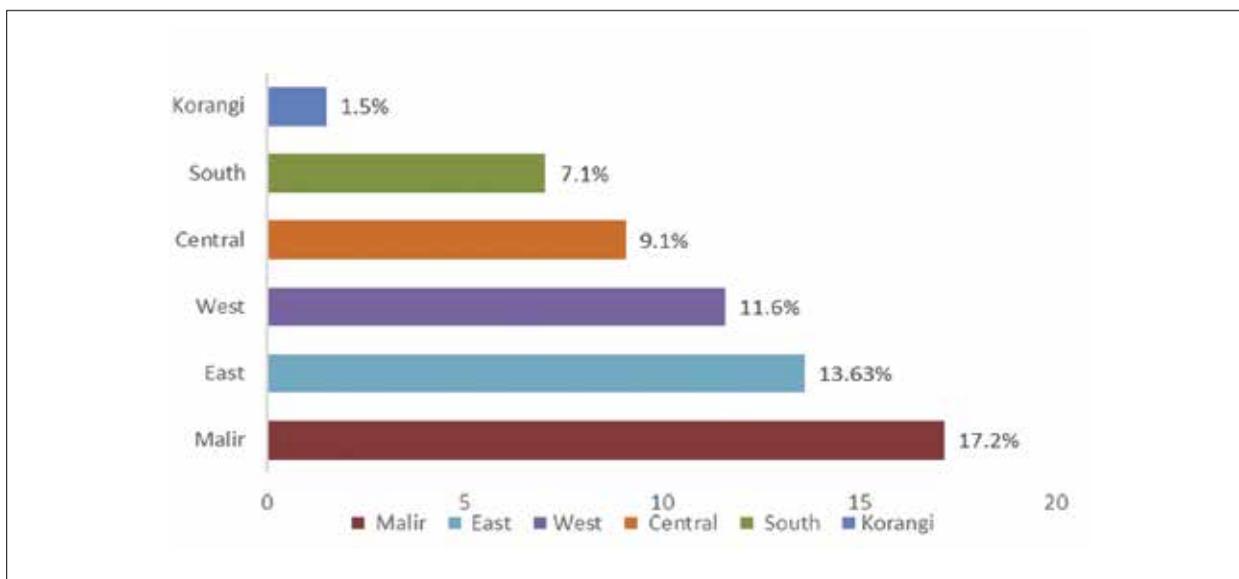


Figure 2: Distribution of human immunodeficiency virus (HIV) positive cases among different districts of Karachi.

DISCUSSION

The current study reported male predominance having HIV with a mean age group of 30.39 ± 10.162 , as endorsed by another study¹⁰. Sindh showed the highest prevalence in the current study with a predominance in the Malir district. The distribution of places among HIV cases directly corresponds to the national data⁸. The recent outbreak of HIV in Sargodha and Larkana represents a very distressing situation¹⁰. The human immunodeficiency virus (HIV) is a worldwide threat. It is estimated that 37.9 million

people are suffering from HIV-1¹¹. During 2005, more than 4 million people were affected and 3 million people died from the disease². According to the Centers for Disease Control and Prevention (CDC), thirty-eight thousand new cases have been recognized annually in the following decade³.

In 1987, the first case of HIV was detected in Pakistan raising its rank among the highly saturated epidemic countries⁴. Pakistan hit the peak worldwide ranking with an average of 17.6% by reporting

an increasing number of cases from 8,360 to 45,990 from 2005 to 2015. It is estimated that 130,000 HIV-positive people are living in Pakistan⁵. In 2018, an outbreak of HIV in Sargodha near Kot Momin was reported. It was misdiagnosed with Hepatitis B or C or Tuberculosis but due to treatment failure, patients were directed to the District Headquarter Hospital in Sargodha for final diagnosis. Approximately, 1.29% of the dwellers of the village were HIV positive^{6,7}.

Furthermore, in 2019, the largest outbreak of HIV in Larkana was reported with the involvement of children being recorded for the first time⁸. It is a common observation that medical and social networks are reluctant to talk about HIV/AIDS in a contented environment, which adversely affects planning strategies to combat HIV/AIDS in Pakistan¹². Social humiliation associated with the disease further worsens the scenario¹³. Less awareness regarding health issues and dependence on non-professional Hakeem and traditional therapists resulted in intense progression and worsening of the disease. Economic, public and political negligence is the most important contributing factors in intensifying its magnitude¹⁴.

The national surveillance data notified three main causes of the spread of HIV in the country including sexual contact, injectable drugs and insecure blood transfusions¹⁵⁻¹⁸. Concerning these risk factors, sexual contact was predominant in this study¹⁹. Sexual transmission constitutes more than 70% of collective cases of HIV. Discussions about such problems are considered taboo and publicly such talks are condemned.⁵ It is necessary to indicate that the epidemic of HIV in Pakistan largely involves drug abusers, comprising approximately 38% of registered cases^{6,20}. This study also reported that 18% of HIV patients, which consequently persuaded us to share that the easy availability of injectable drugs (i.e., narcotics) should be discouraged as it is also one of the main causes of HIV infection. This study helps to acknowledge the relationship between the uncontrolled sale of narcotics/opioids and the recent HIV outbreak in Pakistan.

The current study declared that 8% of HIV cases as a result of sexual relationships with transgenders. Integrated Biological and Behavioral Survey reported that the frequency of HIV-positive cases included 38.4% drug inducers, 7.1% transgender, and 2.2% female sex workers^{21,22}. The increasing trend of the occurrence of HIV in sex workers, drug abusers and transgenders could be due to difficulty in getting employment. HIV/AIDS 2017 United Nations survey, stated that the use of condoms was extremely low among transgenders (24%) and men who have sex with men (22%)²³. Psychological stress and a high rate of drug dependence play an important role in acquiring HIV about sexual

behavior in transgenders²⁴. The current study claimed that a higher prevalence of HIV is due to unchecked blood transfusion and reuse of syringes, which is in harmony with the results of another study²³. Transmission of HIV through contaminated blood is on the rise.

The main reason could be the use of substandard and non-validated screening instruments and methods. The recent event of Kot Imrana is quite exceptional that raised the occurrence of 1.29% to 13.38% in six months where there was an obvious depiction of using the same syringe on multiple patients. A quack, who was responsible for this also, died of HIV later in 2018²⁵. The national Safe Blood Transfusion Program is implementing guidelines for the safe transfusion of blood. According to these regulations, the license will be issued to only those blood banks which ensure good quality screening and safety of the blood products²⁰. This study showed a prominent incidence of HIV due to the lack of use of sterilized instruments during surgical and dental procedures, endorsed by the most recent outbreak of HIV in Larkana, which demonstrated malpractice of healthcare professionals. Ansari et al. reported 26% and 40% of HIV cases from invasive surgical and dental procedures respectively²¹.

In this study, 43% of HIV-positive patients did not know the cause of their disease. Most of them were naive and did not have any knowledge about the route of transmission and the consequences of HIV. The negative behavior of society leaves disastrous effects on the well-being and health of HIV-positive patients²⁵. The burden of HIV is more in married people as compared to the unmarried, the widows and the divorced in the present study. However, other studies contradicted to the findings²². There is an inverse relationship between HIV-positive individuals to the literacy levels in the present study, which agrees with another report²⁶. HIV status is affected by the low level of education in developing countries. Pakistan is among the vulnerable countries with a low literacy rate, higher levels of poverty and huge resistance to awareness of sex education. Therefore, it is required to take effective measures and immediate actions to limit the spread of HIV /AIDs. A multipronged approach should be adopted along with a substantial emphasis on education to fight against social obstruction and carelessness.

There is an urgent need to identify HIV transmission areas and implementation of safe infection control practices. Health authority bodies should investigate fake health practitioners, especially in low socioeconomic and low literacy rate areas where people are at greater risk.

CONCLUSION

The mode of transmission as sexual contact and surgical procedures were found major risk factors

for HIV. It was found that Sindhi males from Malir had a high frequency of HIV. Therefore, the National AIDS Control Programme of the Government of Pakistan should initiate HIV awareness programs, especially among males, screening methods and infection control strategies that will help in combating the spread of the infection.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

ETHICS APPROVAL

Ethical approval was obtained from the Dow University institutional review committee with the reference code: IRB-176/DUHS/Approval/2020/.

PATIENT CONSENT

The consent was taken before the sample collection.

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The research is a self-funded project.

AUTHORS' CONTRIBUTION

FZK conceived the idea, collected the data and approved the manuscript. FF did the literature review, drafting of the manuscript and critical review. SB also collected the data and performed analysis and manuscript writing. AF critically reviewed the manuscript and interpretation of data. EB searched the data for literature review and assisted in data collection and analysis. SI reviewed the literature and initial drafting of the manuscript.

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