ORIGINAL ARTICLE

# ASSESSMENT OF DIFFERENT MODES OF TRANSMISSION OF HIV IN PATIENTS WITH HIV/AIDS

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## ABSTRACT

**Background:** HIV infection can be transmitted via a variety of ways. The objectives of this study were to determine the frequency distribution of gender, age grouping, marital status, and mode of transmission in HIV/AIDS patients.

**Material & Methods:** This cross-sectional study was conducted in ARV Center of DHQ Teaching Hospital, Kohat, Pakistan from 1st September 2013 to 28th February 2014. A sample of 165 cases of HIV/AIDS was enrolled through consecutive sampling. Data was collected by using close ended questionnaire. The demographic variables were gender, age grouping, and marital status while research variable was mode of transmission of HIV. Age grouping was ordinal, and the other two were nominal data. All data were analyzed for frequency, percentage, and mode through IBM SPSS V.21 (IBM Corp., Armonk, NY).

**Results:** Out of 165 patients, 109(66%) were male and 56(34%) female. The modal age group was of 20-29 years with 33 male and 17 female. Out of 165 patients, 109 (66%) were married with 66 (60.55%) male and 43 (39.45%) female. The mode of transmission was commercial sex in 114 (69.09%) of the study subjects, blood transfusion in eight (4.85%), mother to child transmission in six (3.64%), Injecting Drug Use (IDU) in 13 (7.88%), unknown in 23 (13.94%) cases and surgical/ dental procedures in one (0.61%) case. The modal mode of transmission was commercial sex.

**Conclusion:** Sexual transmission through commercial sex is the largest mode of transmission of HIV in our setup. Male are affected more than female due to risky sexual practices.

**KEY WORDS:** Human Immunodeficiency Virus; Acquired Immunodeficiency Syndrome; Antiretroviral Therapy; Immune System; Lymphocytes; Body Fluids; Blood Transfusion; Monogamy; Male Circumcision; Sex Workers.

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## INTRODUCTION

Acquired immunodeficiency syndrome (AIDS) is a human immune system disease caused by infection with human immunodeficiency virus (HIV).[1] Human immunodeficiency virus (HIV) infection disarms the host immune system, primarily targeting the helper-inducer subset of lymphocytes, leading to acquired immunodeficiency syndrome (AIDS).[2] Being a transmissible disease, HIV infection transmission is individually determined global epidemic.[3]

HIV infection can be transmitted via a variety of ways. It needs specific body fluids from a person living with HIV to come in contact with an HIV-negative person. This can happen during intimate sexual contact done without using any protective measures.[4] Sexual transmission is the largest mode of transmission of this disease, with the professional sex workers as the largest source of this disease.[5] One can also acquire HIV from an infected mother during pregnancy, during birth and through breast milk when mother is breast feeding and not taking antiretroviral drugs, [mother-to-child transmission][6] and via sharing of needles as done routinely by drug addicts when they use injectable drug for abuse.[2] Blood transfusion was once a significant mode of HIV transmission but it has been largely eradicated by routine checking of each donor before taking blood for donation and also checking each blood bag and patient for HIV before transfusion.[7]

HIV infection can be prevented by few simple lifestyle modifications; among them monogamy and male circumcision are most important with established evidence.[8] Moreover, early and exclusive breast feeding by the mothers taking antiretroviral drugs can also decrease the potential transmission of HIV from mother to child via breast milk.[9]

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The objectives of this study were to determine the frequency distribution of gender, age grouping, marital status, and mode of transmission of HIV in HIV/AIDS patients.

## MATERIAL AND METHODS

This cross-sectional study was conducted in the Antiretroviral (ARV) Center of Divisional Head Quarters Teaching Hospital, Kohat, Pakistan from 1st September 2013 to 28th February 2014. This center is one of the two treatment centers in Khyber Pakhtunkhwa province, where counseling, outdoor, diagnostic, and indoor treatment facilities are available since 2007. ARV Center Kohat is working under supervision of National and Provincial AIDS Control Program. Patients are referred by physicians working in public or private hospitals and by non-government organizations. A sample of 165 known cases of HIV/AIDS was enrolled through non-probability consecutive sampling technique. All patients with HIV/AIDS were eligible for inclusion.

Two rapid tests for HIV-1/HIV-2 antibodies were performed in the center on two different diagnostic kits marketed by Antibody Colloidal Gold® and Alere®. This technique adapts the solid phase immunochromatography for qualitative detection of HIV-1/HIV-2 antibodies. Reading was possible within 5 minutes visually. Enzyme-linked immunosorbent assay (ELISA) and CD4 counts were performed at Antiretroviral (ARV) Center, Hayatabad Medical Complex, Peshawar. Treatment with antiretroviral therapy was started after CD4 count based on WHO clinical stage 3 and 4.

Data was collected by using close ended questionnaire after explaining the mode of transmission of HIV to the patients and taking them into confidence that their information will be kept strictly confidential. Both verbal and written informed consent was taken prior to obtaining the data. The demographic variables were gender, age grouping, and marital status while research variable was mode of transmission of HIV. The age was categorized as; <10 years, 10-19 years, 20-29 years, 30-39 years, 40-49 years, 50-59 years, and > 60 years. The mode had six attributes of commercial sex, blood transfusion, mother to child transmission, Injecting Drug Use (IDU), unknown and surgical/ dental procedures. Age grouping was ordinal, and the other two were nominal data. Ordinal and nominal data were analyzed for frequency, percentage, and mode. Data was analyzed using computer statistical software IBM SPSS for Windows version 21 (IBM Corp., Armonk, NY, USA).

## RESULTS

One hundred and sixty five (165) patients were included in our study. Male were 109 (66%) and female were 56 (34%). The modal age group was of 20-29 years with 33 male and 17 female. (Figure 1)

Out of 109 male, 29 were single, 65 were married without HIV positive spouse, and 15 were married with HIV positive spouse. Out of 56 female, five were single, 46 were married without HIV positive spouse, and five were married with HIV positive spouse. The age group 30-39 years had the largest number of married male and married female patients and male patients in the same age group had the highest number of HIV positive spouse. The female patients with positive HIV spouse were maximum in age group of 20-29 years. (Table 1)

**Table 1: Marital status across age grouping of patients with HIV/AIDS (n=165).**

| Patient's Age Groups | Patients Gender | | | | | |
|---|---|---|---|---|---|---|
| | Male | | | Female | | |
| | Single | Married without HIV + Spouse | Married with HIV Positive Spouse | Single | Married without HIV + Spouse | Married with HIV Positive Spouse |
| < 10 years | 3 | — | — | — | — | — |
| 10-19 years | 2 | — | — | 1 | 3 | — |
| 20-29 years | 13 | 16 | 4 | 2 | 12 | 3 |
| 30-39 years | 5 | 21 | 5 | 1 | 13 | 1 |
| 40-49 years | 4 | 16 | 3 | — | 11 | 1 |
| 50-59 years | 2 | 8 | 1 | 1 | 6 | — |
| > 60 years | — | 4 | 2 | — | 1 | — |
| Total group wise | 29 (26.6%) | 65 (59.6%) | 15 (13.8%) | 5 (8.9%) | 46 (82.2%) | 5 5 (8.9%) |
| Total Married | | 80 (73.4%) | | | 51 (91.1%) | |
| Grand Total | 109 (66%) | | | 56 (34%) | | |

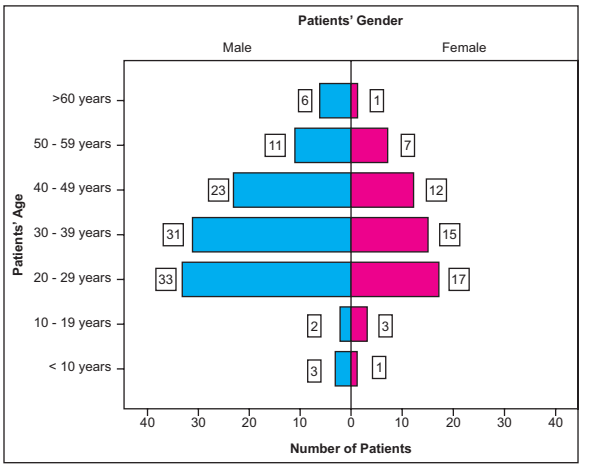


Figure 1: Age grouping across gender distribution of patients with HIV/AIDS

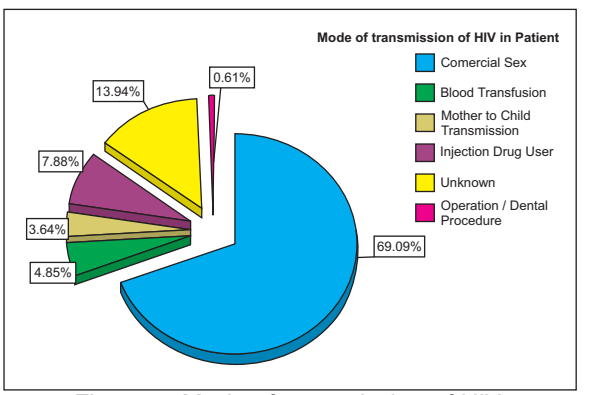


Figure 2: Mode of transmission of HIV

The mode of transmission was commercial sex in 114 (69.09%) of the study subjects, blood transfusion in eight (4.85%), mother to child transmission in six (3.64%), Injecting Drug Use (IDU) in 13 (7.88%), unknown in 23 (13.94%) cases and surgical/ dental procedures in one (0.61%) case. The modal mode of transmission was commercial sex. (Figure 2)

## DISCUSSION

Worldwide, an increase in number of people living with HIV was recorded with estimated 35 million in 2012.[10] By the end of 2003, it was estimated that more than 5.1 million people were living with HIV in India. This figure had risen from a 3.87 million estimated in 1998, more than a million new cases in five years (1998-2003).[11] The UN and Pakistan Government estimates put the number of HIV/AIDS cases in 2010 around 97,000 in Pakistan, ranging from lowest estimate 46,000 to highest estimate 210,000.[12]

In this study, majority of patients were young male, with age 20-29 years. This age wise distribution of HIV/AIDS in the study is similar to international data on HIV/AIDS.[13] Also; male patients were more than female. This is in accordance with global and local statistics.[3,14] This is due to a fact that young males have risky behavior for acquisition of infection.[15] This behavior makes them vulnerable to sexually transmitted diseases via unprotected sex with a professional sex worker.[16] Another reason of this high male proportion is due to the fact that more than two million Pakistani work in middle east countries alone in hostels while their families are back at home in the country.[17] Majority of HIV/AIDS patients in the study acquired infection while they were abroad for earning or recreation purposes.

Low socioeconomic status along with easy and cheap availability of professional sex workers in abroad leads young men to acquire services of professional sex worker at low costs, majority of whom are reservoirs of HIV and other sexually transmissible infection. This is partly due to the fact that the sex workers are themselves poor and ignorant to their own and their customer's health[18] and partly due to unsafe sex and multiple customers of different localities and ethnicities.

Injectable drug abuse is a social evil. Injectable drug users (IDUs) share needles which leads to transmission of blood borne pathogens among them. This leads to direct contamination of needle by an HIV positive partner which is subsequently transmitted to all the needle sharers.[19] IDUs are common in Pakistan. This again is dominated by male gender.[20] Our findings regarding HIV/AIDS transmission via needle sharing behavior of injection drug users are similar to those already reported, and support the researchers working in Pakistan on this mode of HIV transmission.[21]

Apart from above mentioned modes of transmission of HIV/AIDS, other modes were via blood transfusion and from mother to child during pregnancy, labor and breast feeding. These modes are though less frequent but significant as they are potential targets for prevention of HIV transmission. Our findings regarding these two modes are in support to international studies.[6,7] Majority of our patients were married, and some of them had HIV positive spouse as well. This is a significant finding as the need of educating the masses, specially married couples regarding this disease is further highlighted by this statement.

As this was a cross-sectional study, there are several technical limitations in our study. The relationships between variables included in our study may be an under estimation or over estimation. These relationships can be different in a longitudinal survey. In addition, certain patient did not know about their mode of transmission. This limits the measurements at a set point in time.

## CONCLUSION

Sexual transmission through professional/ commercial sex is the largest mode of transmission of HIV in our setup. Male are affected more than female due to risky sexual practices.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
GRANT SUPPORT AND FINANCIAL DISCLOSURE
None declared.