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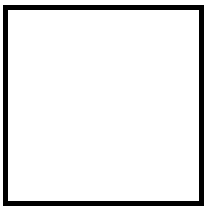

# Seroprevalence of antibodies to HIV among injecting drug users in Kathmandu and HIV subtyping

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## ABSTRACT

**Blood samples from two hundred and twenty injecting drug users were collected for antibodies to HIV between July 1997 to June 1998.**

**ELISA tests were performed in duplicate on all the serum samples. One hundred and five samples 105/220 (47.7%) were tested positive for antibodies to HIV. ELISA positive samples were rechecked by western blot and confirmed to have HIV-1. Bands of gp160, gp120, gp40, p24, p31, p55 of HIV-1 were present in positive samples. Results of HIV subtyping showed subtype C, similar to the one prevalent in the Indian subcontinent.**

**Among one hundred and five positive cases, ninety-nine were male and six were female, M:F ratio 16.5:1. The youngest age of HIV positive case was 13 years old and the oldest was 45 years of age. The majority (70) was between the age of 20-29 years of age. The most common drug used was "Tidigesic" (bupronorphine) (90/105), followed by brown sugar (10/105), nitrazepam (4/105), and "Fortwin" (1/105). Ninety-four HIV positive persons gave the history of sharing needles among more than two persons. Frequency of drugs used varied from two times a day to maximum six. HIV positive cases were detected from 18 districts of Nepal. The majority (38/105) of the HIV positive cases were residents of Kathmandu.**

*Keywords: Antibodies to HIV; injecting drug users; HIV subtype; Western blot test.*

## INTRODUCTION

Human immunodeficiency virus (HIV) is the most significant emerging infectious pathogen of this century.[1] Since recognition in 1981 that it causes acquired immunodeficiency syndrome (AIDS)[2,3,4], HIV

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has produced a worldwide epidemic. The first HIV positive case in Nepal was detected in the year 1988 in Kathmandu. Since then reports of HIV positive cases have been detected in commercial sex workers, truck drivers, blood donors, among pregnant women and in general population. Very few data is available on the seroprevalence of HIV and no data on HIV subtype among injecting drug users in Nepal.

## MATERIALS AND METHOD

Precounselling and informed consent was taken from all the participants. Five millilitres each of venous blood samples from two hundred and twenty ID users were collected aseptically from antecubital vein using single use disposable syringe. Samples were collected from the month of July 1997 to June 1998. Serum were separated immediately and stored at –20$^{O}$C for future testing. Whole blood from ten HIV positive persons were taken in filter paper for HIV subtyping. Demographic data were collected from each participant. Information on age, gender, marital status, permanent resident address, type of drugs used, frequency of use and number of person sharing the same needle were collected. All the serum samples were tested at Siddhi Polyclinic Pathology lab in Kathmandu. Samples were run in duplicate by Enzyme Linked Immunusorbent Assay (ELISA) using United Biomedial Inc (UBI) HIV-1/2 EIA kit. Non reactive controls, weakly reactive controls and strongly reactive controls were run during the assay. Optical density of the test samples were measured in full plate ELISA reader from Molecular devices. Cut off values were determined. Samples found positive were rechecked.

Western blot HIV confirmation test was performed using HIV BLOT 2.2 from Genelabs Technologies USA. All non reactive, weak reactive and strong reactive controls were run at the same time.

Blood samples from ten HIV positive persons were collected in separate filter papers (Dried Blood Spot technique) and were sent to AIDS Molecular Biology Laboratory, Macfarlane Burnet Centre for Medical Research, Australia, for HIV subtyping.

## RESULTS

ELISA test for antibodies to HIV were positive in one hundred and five (47.7%) samples out of two hundred and twenty samples tested. OD readings were well above the assigned cut off value. Western blot test for HIV antibodies confirmed reactivity to HIV-1. Bands of gp160, gp120, Gp40, p24, p31, p55 of HIV-1 were detected in positive samples.

Results of HIV subtype among Nepali HIV cases using dried blood spot technique, amplified HIV subtype C envelope sequences. These cluster most closely with isolates from Indian subcontinent.

Ninety-nine out of 105 (94.3%) of HIV positive cases were male and (6/105) 5.7% were female. M:F ratio was 16.5:1. The youngest among the HIV positive IDUs was 13 years of age and the oldest was 45 years.

**Age distribution among the 105 HIV positive cases.**

| *Age* | *Number & % of HIV positive cases* |
|---|---|
| 11-19 yrs | 15 (14%) |
| 20-29 yrs | 70 (67%) |
| 30-39 yrs | 19 (18%) |
| 40-49 yrs | 1 (1%) |

**Most frequently used drugs among the 105 HIV positive cases.**

| | |
|---|---|
| Tidigesic | 90/105 |
| Brown sugar | 10/105 |
| Nitrazepam | 4/105 |
| Fortwin | 1/105 |

**Number of persons sharing the same needle among HIV positive cases.**

| | |
|---|---|
| Did not share with another person | 11 |
| Shared among 1-5 persons | 88 |
| Shared among 6-10 persons | 5 |
| Shared among 11-20 persons | 1 |

HIV positive cases were detected from 18 districts of Nepal and the highest prevalence was detected from the residents of Kathmandu district.

**HIV positive cases**

| *District of residence* | *Number of HIV positive cases* |
|---|---|
| Kathmandu | 38 |
| Morang | 12 |
| Lalitpur | 11 |
| Kailali | 10 |
| Rupandehi | 7 |
| Siraha | 5 |
| Banke | 4 |
| Sarlahi | 3 |
| Bhaktapur | 2 |
| Dhanusha | 2 |
| Kaski | 2 |
| Kavre | 2 |
| Parsha | 2 |
| Bajhang | 1 |
| Ilam | 1 |
| Nawalparashi | 1 |
| Nuwakot | 1 |
| Dhankuta | 1 |

## DISCUSSION

HIV belongs to the lentivirus subfamily of retrovirus, which produce chronic infection in the host and progressively damages the hosts immune system. Two major types in human have been characterized: HIV type 1 (HIV-1), the predominant HIV type throughout the world, and HIV type 2 (HIV-2) first reported from and still primarily found in persons from West Africa.[5,6]

Seroprevalence of antibodies to HIV-1 among IDUs in Kathmandu is 47.7%. HIV-1 subtype C from IDUs of Nepal is being reported for the first time.

There are at least nine genetically distinct subtyes or clades of HIV-1 virus; they are subtypes A through H and subtype O. Distribution of subtypes are geographically defined. HIV-1 subtype B predominates in North America. The epidemic of HIV-1 in Southeast Asia is chiefly attributed to subtype E virus. Most HIV-1 in southern India appears to be env subtype C. More study is required on the epidemiology of this strain.

There are about 10 million IDUs in the world with a very low prevalence of HIV, 1% among IDUs in Glasgow, England and almost 90% in Myanmar.

In Nepal, it is estimated that there are approximately 50,000 drug users. Out of this 18,000 are injecting drug users. This means, there are 8640 HIV positive cases among IDUs in Nepal at present. As more and more people of the younger age are resorting to

IDU, it is expected that this scenario of HIV positive cases injecting drug users are definitely going to increase unless some intervention is done immediately. Preventive measures focused in this high risk groups of IDUs will surely reduce the epidemic of HIV in Nepal. Tidigesic injection has been the most favoured drug among the IDUs in Kathmandu compared to injectable cocaine in Vancouver and Montreal. This maybe because it is cheap and easily available. People between 20-29 years of age seem to be affected most. Though most of the IDUs are residents of Kathmandu, it is evident that residents from other seventeen districts of Nepal are gradually being affected.

Worldwide ELISA test for antibodies to HIV was available in commercial basis in 1986. It is a sensitive test for the screening of HIV. Western blot as a confirmatory test for the diagnosis and differentiation of HIV-1 from HIV-2 is a specific test. Both tests are available in Kathmandu. However, the facilities for polymerase chain reaction (PCR) test to detect viral load, p24 antigen test and CD4+lymphocytes counting facilities are lacking in Nepal which are essential for monitoring effective treatment.

People who inject drugs are at the greater risk of acquiring HIV infection. Enquiry on the drug injection behaviour should be the part of history taking in our clinical practice. Those who give history of injecting drug must have HIV antibody tested. Every effort should be taken to bring about behavioural change in IDUs to prevent HIV infection. Effective medical counselling should be provided to the IDUs and individual health promotion should be encouraged.

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