

## Sero-Prevalence of HIV-1/HIV-2 Infection in Bhairahawa, Western Nepal - A Hospital Based Study

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### Abstract

**Introduction** In Nepal, the first HIV/AIDS case was reported in July 1988. Limited treatment options and non-development of vaccine for HIV/AIDS so far, made it imperative to look for alternatives to control its spread. Limited number of studies on sero-prevalence of HIV-1/HIV-2 infection in hospital patients has been conducted in Nepal.

**Objectives** To assess the prevalence of HIV-1 and HIV-2 antibodies in patients attending the Universal College of Medical Sciences (UCMS) Teaching Hospital, Bhairahawa, western Nepal.

**Methods** A total of 2246 sera sample, collected during the period from March 2000 to December 2003 were tested for HIV-1 and HIV-2 antibodies. The HIV tests were performed by three different rapid/simple immunoassay kits for detection of antibodies to HIV-1/HIV-2 in sera samples. Sera reactive in all three different immunoassays were considered to be positive for HIV-1 or HIV-2 or both.

**Results** Of the 2246 sera tested for HIV-1 and HIV-2, 72 (3.20%) were found to be positive. The prevalence was higher (4.66%) in males than females (1.53%). Males in the age group 30-44 years showed a highest prevalence of 9.00 percent. None of them were sero-positive for HIV-1/HIV-2 below 15 years and above 60 years of age. A total of 4 (0.18%) patients showed sero-positive for anti-HIV-2 antibodies. Two (0.09%) were found to have both anti-HIV-1 and HIV-2 antibodies and two (0.09%) patients had only anti- HIV-2 antibodies.

**Conclusion** A high sero-prevalence (3.20%) was found in hospital patients, which was an indicative of an increased prevalence of HIV infection in western Nepal. The data could be used for future HIV/AIDS intervention and prevention programs and monitoring HIV prevalence in hospital setting.

**Keywords** HIV-1, HIV-2, AIDS, Sero-prevalence, Hospital patients, Nepal.

### Introduction

With no signs of an early development of HIV/AIDS curative therapies/or vaccines to protect individuals, in sight in the near future, HIV/AIDS seems to be assuming threatening proportions especially in the developing and under developed countries. In Nepal, the first HIV/AIDS case was reported in July 1988<sup>1</sup> and since then over 60,000 adult HIV cases are estimated, with HIV prevalence of 0.52 percent in the adult (15-49 years of age) population, as of the end of 2003<sup>2</sup>-HIV-2 was first isolated in 1986 in West Africa<sup>3</sup>. It shares many properties with HIV-1 in terms of morphology and tropism for CD4 cells where as it differs at molecular clinical and epidemiological levels<sup>4</sup>. HIV-2 has been detected and reported in India<sup>5,6</sup> in Europe and United States<sup>7,8</sup>.

Nepal is unique in having direct and vital links with both of Asia's potential giants, India and Thailand. An epidemic in either of these countries would mean that Nepal is next in line<sup>9</sup>. In Nepal, an increasing trend was being observed in the number of reported HIV/AIDS cases though with fluctuation<sup>10</sup>. The most prevalent mode of transmission of HIV was still heterosexual, in the Southeast Asia, though intravenous drug use accounted for significant numbers in Indonesia and Nepal<sup>11</sup>.

Literature revealed only one study investigating prevalence of HIV/AIDS in-patients attending a hospital in Nepal<sup>12</sup>. We conducted this investigation to determine the HIV-1 and HIV-2 sero-prevalence in-patients attending UCMS Teaching Hospital, Bhairahawa, western

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Nepal (bordering India) during the period March 2000 to December 2003. These data could be used for future intervention programmes and monitoring HIV prevalence in a hospital setting.

## Methodology

A total of 2246 sera samples were tested for HIV-1 and HIV-2 antibodies. HIV testing was done in suspected cases of HIV infection/AIDS, psychiatric cases, medical ward cases, antenatal cases and before surgery. Thus, patients attending the hospital represented a cross-section group of population in this geographical area studied.

Screening was done using HIV rapid/simple immunoassay (J. Mitra & Co. Ltd., India). However, a confirmatory test is required. Considering that the combination of ELISA/or rapid/simple immunoassay can provide results as reliable as, and in some cases more reliable than the ELISA/western blot combination and at much lower costs, a repeat HIV rapid / simple immunoassay test (Standard Diagnostics Inc., Korea) was used as the confirmatory test. Since diagnosis of HIV-1/HIV-2 infection was our objective, a third rapid/simple immunoassay test for HIV-1/HIV-2 (PMC Medical India Pvt. Ltd., India) was performed, if serum was found reactive in the second assay or in the repeated first assay. Serum reactive in all three tests was considered positive for antibody to HIV-1 or HIV-2 or both. Thus, strategy III for diagnosis of HIV antibody testing procedure was followed as per WHO<sup>13</sup> criteria.

## Results

Prevalence of HIV-1 and HIV-2 antibodies was found to be 72 (3.20%) out of a total of 2246 sera tested. Prevalence of HIV sex-wise is shown in Table 1.

**Table 1: Sex-wise numbers and prevalence of HIV in hospital patients studied.**

Sex	No.	No. of Sero-positives	Prevalence Total (%)	Prevalence Sex-wise (%)
Males	1203	56	56/2246=2.49	56/1203=4.66
Females	1043	16	16/2246=0.71	16/1043=1.53
Total	2246	72	3.20	

Sex-wise and age-wise prevalence of HIV sero-positively in hospital patients studied is shown in Table 2.

**Table 2: Sex-wise and age-wise prevalence of HIV sero-positive in hospital patients studied.**

Age-group (Years)	Males	No. of Sero-positives (%)	Prevalence (%)	Females	No. of Sero-positives	Prevalence (%)
<15	97	0	0.0	53	0	0.0
15-29	531	25	4.71	508	09	1.77
30-44	289	26	9.00	314	06	1.91
45-60	185	05	2.70	120	01	0.83
>60	101	0	0.0	48	0	0.0
Total	1203	56	4.66	1043	16	1.53

No sero-positive cases were found in <15 years and >60 years of age. Males in 30-44 years age group showed the highest sero-prevalence of 9.00 percent, while females in the same age group showed sero-prevalence of 1.91 percent. Table 3 shows comparative details of reported HIV prevalence from Nepal and other countries.

Two persons (0.09%) were found to have dual infection with HIV-1/HIV-2 and two persons (0.09%) were found to be sero-positive for HIV-2 only.

Comparative details of HIV-1, HIV-2 and both HIV-1/HIV-2 sero-positive cases are shown in Table 4. Sero-positive for HIV-1 only was found to be 3.02 percentage.

**Table 3: Reported HIV prevalence from Nepal and other countries.**

Study / Region	Years	Prevalence (%)
(Bhairahawa, Nepal)	1995-1998	3.20
Nepal <sup>12</sup> (UMHT, Palpa)		10
India <sup>14-16</sup>	1996-1998	0.29-0.54
India <sup>17</sup>	1986-1992	1.02
India <sup>17</sup>	1992-1998	2.27
United Kingdom <sup>18</sup>	2001	0.1

**Table 4: Comparative details of HIV-1, HIV-2 and both HIV-1 and HIV-2 dual positive cases in hospital patients studied**

No. Patients studied (No./%)	Study population and HIV positive		
	HIV-1 Positive (No./%)	HIV-2 Positive (No. /%)	HIV-1 /HIV-2 Dual Positively (No./%)
2246/(100)	72/(3.02)	02/(0.09)	02/(0.09)

## Discussion

The sero-prevalence of HIV infection in-patients attending Teaching Hospital in Bhairahawa, western Nepal (bordering India) from March 2000 to December 2003 was 3.20 percent. HIV prevalence reported from hospital based study in Nepal<sup>13</sup> was 10 percent. India<sup>14-17</sup> and other countries<sup>18</sup> reported a much lower prevalence as shown in Table 3. In comparison, HIV prevalence found in this study was quite alarming, as reported HIV prevalence was still low in India and United Kingdom.

High prevalence (3.20%) observed in hospital patients, which was an indicative of a higher prevalence among different groups of populations. HIV epidemic in Nepal has changed from a "low level" epidemic to a "concentrated" epidemic within specific sub-groups of sex-workers and intra-venous drug users (IDUs)<sup>19</sup>. In this context, the results of this study assumed significance and indicative of an emerging epidemic in Nepal.

The prevalence among males was found to be higher (4.66%) than females (1.53%). This could be attributed to more risky sex behavior practiced by males due to prevailing socio-cultural-economic scenario. None in the lower age group (<15 years) and older age group (>60 years) had been found to be sero-positive for HIV. This could be due to hardly any / or declining sex activity prevalent in these age group populations.

This study revealed that highest incidence of HIV infection in males and females was found in the age

group of 30 to 40 years (Table 2). Earlier study<sup>20</sup> reported in Nepal showed a majority of HIV infected cases belonged to the younger age group (20-29 years). One study done in Malawi<sup>21</sup> showed the highest prevalence was in a younger age group (25-34 years) in 1994 and shifted to an older age group (35-44 years) in 1998. In view of the above it was apparent that now more cases were being detected in older age groups.

From the present study, it is very clear that in Nepal, the HIV infection is taking roots in the older age group population - which is sexually active and economically self-sufficient. The rate of transmission might be difficult to slow down because there were communities (e.g. Badi community) in Nepal where prostitution was perceived as a means of better material existence<sup>22</sup>. Other contributing factor to sustained spread of HIV/AIDS was that pre-marital and extra-marital sexual contacts were not uncommon in Nepal<sup>20</sup>.

Out of the four (0.18%) HIV-2 positive sera, two showed evidence of concomitant HIV-1 infection. HIV-2 had been reported from several countries<sup>3,4,7,8</sup> and India<sup>5,6</sup>. Dual infection with HIV-1 and HIV-2 is not uncommon as both viruses are transmitted through sexual and peri-natal routes though the transmission of HIV-2 is considerably lower than HIV-1 by these routes<sup>23</sup>.

This study was carried out in a border district of Nepal (Bhairahawa, Rupandehi district) and India (Sonauli, Maharajganj district). The international borders between Nepal and India are porous and population movement has continued for centuries. Trafficking in women and young girls particularly has increased significantly,

leading too much wider dissemination of sexually transmitted diseases. It is also well known that one of the most important routes of transmission of HIV is through sex. In view of these border district assumes an important role in ongoing efforts to control communicable diseases including sexually transmitted infections and HIV/AIDS<sup>11</sup>.

A few limitations of the current study need to be noted. We were not able to conduct laboratory testing for STDs such as gonorrhoea and Chlamydial infections. We also did not extensively investigate the behavioral factors that could influence HIV transmission especially among the core groups such as commercial sex workers and IDUs.

The results of this study emphasize the urgent need for intervention measures like sex education, health education and preventive education among the general population to reduce HIV infection in this setting.

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