



Original Research Article

A Study to Assess Prevalence of Human Immunodeficiency Virus (HIV) Among Blood Donors in a Tertiary Care Hospital of Central Nepal

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ABSTRACT

Background: One of the life saving interventions in health care services is blood donation. Human Immunodeficiency Virus (HIV) is transmitted from the seemingly healthy blood donors; and WHO has recommended for screening of HIV so as to provide safe blood. The present study aimed to determine the seroprevalence of above HIV in prospective blood donors in Nepal.

Methodology: Data from Blood Bank of the National Medical College, Birgunj, Nepal were collected for this study, from February 2013 to July 2014. The method of study was descriptive and comparative in retrospective aspect. All the samples were tested for HIV by using ELISA test. Data were analyzed statistically by Chi-square test.

Results: Among 1667 blood donors, majority 90.3% (1506) was male and 9.7% (160) were female; with 829 (49.7%) and 837 (50.3%) blood donors from urban and rural, respectively. Among the donors, volunteer donor were 77 (4.6%) and 1589 (95.4%) were replacement donor.

HIV prevalence was 1.26% with maximum in 17 to 28 years. Out of 1667 samples of the blood donors, 21 (1.26%) were HIV positive. HIV prevalence in male and female were 14 (0.84%) and 07 (0.42%), respectively. The prevalence of HIV infections occurred among urban 09 (0.54%) and rural blood donors 12 (0.72%). Of the total positive male donors (14), 6 (0.36%) were urban and 8 (0.48%) were rural; of the total positive female donors (07), 3 (0.18%) were urban and 4 (0.24%) were rural. Moreover, HIV among Volunteer Blood Donor was 1 (0.06%) and 20 (1.20%) among Replacement Blood Donor.

Conclusions: The prevalence of HIV among blood donors of Central Nepal is 1.26%; higher in males as compared to females; and increased in rural blood donors than urban blood donors.

Keywords: HIV, blood donors, Central Nepal.

INTRODUCTION

One of the very serious complications of blood transfusion is

transfusion transmissible infections (Hassan et al., 2008). Blood transfusion is beneficial and safe for the recipient when it is

performed in strict compliance with immunological and hygienic standards, following a strict screening of donors (Moukoko et al., 2014); especially in a developing country where national blood transfusion services and policies, appropriate infrastructure, trained personnel and financial resources are inadequate (Nagalo et al., 2011).

Transmission of Acquired Immunodeficiency Syndrome (AIDS) through transfusion in mid-1980s raised the question of blood safety (Das et al., 2011). The median overall risks of HIV infection in sub-Saharan Africa is 1 infection per 1000 units (Jayaraman et al., 2010); while the estimate is 1/2600 000 in developed countries (Traineau et al., 2009). Similarly, in Nepal, the prevalence rate of HIV via blood transfusion was 3.2% in Western Nepal (Chander and Pawaha, 2004); 1.6% in healthy Nepalese males (Joshi and Ghimire, 2003); and 0.054% in the regional blood transfusion services in Nepal (Tiwari et al., 2008).

There is therefore a need for continuous monitoring of the seroprevalence of Human Immunodeficiency Virus (HIV) that cause life threatening morbidities among blood donors so as to estimate the risk of infection and put in place better blood donor recruitment policies that will make blood safer for the recipients especially in a tertiary health facility like National Medical College, Birgunj, Nepal. Hence, we aimed to determine the seroprevalence of HIV in prospective blood donors who visit the blood bank of the National Medical College, Birgunj, Nepal as no such study has been done in Central Region of Nepal to assess its prevalence.

MATERIALS AND METHODS

Data from the Blood Bank of the National Medical College, Birgunj, Nepal were collected and used in this study. Donors were selected if they fulfilled all the

criteria to be eligible for donation as described by the Nepal Red Cross Society. Before drawing the blood, each donor was requested to fill a blood donor's form. The data analyzed period was from February 2013 to July 2014. The methods of study were descriptive and comparative in retrospective aspect. All the samples were tested by using ELISA test. Initially, reactive sera were reconfirmed by repeat testing. Blood samples were tested anonymously and confidentiality was maintained as described by Nepal Red Cross Society, Blood Transfusion Service, Nepal.

Statistical Analysis:

Data were analysed using SPSS computer software (SPSS 16, 2008; SPSS Inc., Chicago, IL, USA) and Chi-square test.

Ethical Issues:

Ethical clearance was obtained from National Medical College Institutional Review Committee and verbal consent was obtained from hospital administration before the commencement of data collection. Confidentiality of the information was ensured as codes instead of the names of the subjects were registered on the data collection format.

RESULTS

Among 1667 blood donors, majority 90.3% (1506) was male and 9.7% (160) were female; with 829 (49.7%) and 837 (50.3%) blood donors from urban and rural, respectively. Among the donors, volunteer donor were 77 (4.6%) and 1589 (95.4%) were replacement donor. HIV prevalence was 1.43% with maximum in 17 to 28 years (Table I).

Out of 1667 samples of the blood donors, 21 (1.26%) were HIV positive. HIV prevalence in male and female were 0.84% (14) and 0.42% (07), respectively. The prevalence of HIV infections occurred among rural blood donors 0.72% (12) and urban 0.54% (09). Of the total positive male donors (17), 6 (0.36%) were urban and 8

(0.48%) were rural; and of the total positive female donors (17), 3 (0.18%) were urban and 4 (0.24%) were rural. HIV infection was found in 1.26% of the blood donor population. HIV prevalence was 1.28% among volunteer donors and 1.25% among replacement donors but this difference was not significant (Table I).

Table I: Distribution of HIV infections and its prevalence according to age, sex, urban, and rural among Blood Donors

Parameters	Findings (in Number or %)
Total Blood Donors	1667
Total Male Blood Donors	1506 (90.4%)
Total female Blood Donors	160 (9.6%)
Total Volunteer Blood Donors	78 (4.6%)
Total Replacement Blood Donors	1589 (95.4%)
Total Urban Blood Donors	829 (49.7%)
Total Rural Blood Donors	837 (50.3%)
HIV Prevalence among Blood Donors	21 (1.26%)
HIV Prevalence among Male Blood donors	14 (0.84%)
HIV Prevalence among Female Blood Donors	07 (0.42%)
HIV among Rural Urban Blood Donors	09 (0.54%)
HIV among Rural Blood Donors	12 (0.72%)
HIV among Urban Male Blood Donors	6 (0.36%)
HIV among Rural Male Blood Donors	8 (0.48%)
HIV among Urban Female Blood Donors	3 (0.18%)
HIV among Rural Female Blood Donors	4 (0.24%)
HIV among Volunteer Blood Donor	1 (0.06%)
HIV among Replacement Blood Donor	20 (1.20%)

DISCUSSION

Knowledge of the prevalence and distribution of HIV in Central Nepal is important for the planning of preventive measures and the development of vaccination programmes. The first case of acquired immune deficiency syndrome (AIDS) in Nepal was reported in 1988 (Gurubacharya et al., 2004).

The purpose of this study was to determine the seroprevalence of HIV among blood donors of Central Nepal. The present study, which is believed to be the first in the Central Nepal, showed a significantly higher seroprevalence of HIV (1.26%) among the blood donors of Central Nepal as compared to seroprevalence of HIV infection reported in other parts of the world.

Our findings of HIV prevalence was higher than seropositivity rate described for Kathmandu Valley (0.16%) (Nepal Red

Cross Society, 2006/07), 0.12% in Kathmandu, Nepal (Shrestha et al., 2009), 0.247% in North India (Makroo et al., 2011), 0.32% in Kolkata (Das et al., 2011), 1% in Port Harcourt in South of Nigeria (Ejele et al., 2005), zero% in voluntary non remunerated blood donors in Northern Pakistan (Asif et al., 2004), zero% retroviral infections with a tendency to increase with age in Saudi Arabia (El-Hazmi, 2004), 0.008% in voluntary blood donors in Bangladesh (Ahmed et al., 2009), and zero% among college-going first-time blood donors in Pakistan (Abdul et al., 2000).

However, higher seroprevalence has been reported previously such as 3.2% in patients attending teaching hospital from Bhairahava, Western Nepal (Chander and Pawaha, 2004), 3.1% in Osogbo, south-west Nigeria (Buseri et al., 2009), 2.8% in Kaduna Northern Central Nigeria, and 3.8% in the northern city of Kano, Nigeria (Imoru et al., 2003).

Sex specific prevalence of HIV infection was 0.84% for males and 0.42% for females, and all HIV cases were in blood donors aged 17 to 28 years. The findings of higher infectivity among men in the reproductive age group (17-28 years) as compared to female, in the present study are in concurrence with the findings of Tiwari et al., 2008. Heterosexual promiscuity seems to be the only cause of higher seropositivity in males. The higher rate of sero -prevalence in these age groups might be attributed to their being sexually active.

In this study, the recorded Male/Female sex ratio was 9.4/1 for all blood donors in our study. Our findings are consistent with previous observations in Tanzania and Nepal (Mecky et al., 2006; Tiwari et al., 2008) that showed less representation of women than men as blood donors. This could be explained by physiological differences between men and women, where women are not allowed to

make blood donation during menstruation, lactation and or in pregnancy.

Moreover, volunteer donors accounted for 4.6% and replacement donors for 95.4%. There was statistically significant difference in blood donation between volunteer donors and replacement donors ($p < 0.05$). This could be because replacement donors are active in the population, are willing to donate blood if asked, are submitted to little pressure, do not receive incentives, and accept repeat donation. The reasons for voluntary donation within the study population can be explained by various factors, including previous loss of a relative due to lack of blood and/or the quest for their HIV status. Replacement donors are those who donated blood to acquaintances (relatives and friends) in urgent need. Our results are similar to other studies conducted in several countries (Mecky et al., 2006; Koangan et al., 2009). Contrarily to our data, some studies conducted over long periods in France and Turkey have shown that blood supply is mainly based on volunteer donation (Pillonel and Laperche, 2006; Uzun et al., 2013).

On the other hand, with regard to the type of donation, higher seroprevalence was seen among subjects who donated blood for replacement purpose for relatives and friends than those who donated on voluntary basis and the difference was statistically significant ($p < 0.05$). The possible explanation could be that the probability of knowing one's sero-status could be higher for those who volunteer for blood donation, in which case the sero-reactive abstain from donation, compared to those who were asked for replacement.

The higher prevalence of HIV among rural blood donors as compared to urban blood donors in this study could be explained in two ways-First, there is a significant gap on knowledge, attitude, and practice of using all possible means of HIV/AIDS prevention among the rural

population. Second, the urban population is close to information as well to services to find about their sero-status than the rural population. Thus, urban blood donors with sero-positive status would be deterred from the blood bank and this could in turn lower the prevalence of sero-positivity among donors from urban area. However, it would be necessary to conduct a further study to find out the factors responsible for the increased sero-prevalence trend among the rural population.

SUMMARY AND CONCLUSIONS

The prevalence of HIV among blood donors of Central Nepal is 1.26%; higher in males as compared to females; and increased in rural blood donors than urban blood donors.

Our findings further suggest following important aspects which might prove useful to lower the seroprevalence in blood donors: greater clarity of the pre-donation questionnaires (detailing the possible exposures at risk), more privacy for the donor at the time of completing the questionnaire (private areas), systematic use of questionnaires for all donors (including repeat donors), stringent donor selection criteria, effective donor education, blood donation by regular volunteer donors and donor notification, and counseling of seropositive donors and appropriate counselling that specifically investigates 'at risk' behaviours.

Moreover, to this effect, the results of the study acknowledge the application of grass root level approach in promoting public health education program. The health education must be geared towards attitudinal and behavioral change with special emphasis given to sexually active age groups and rural population. Finally, we recommend the records in the blood transfusion center should include the marital and literacy status of the blood donors. This can help to identify factors that affect sero-

prevalence and to have strategic plan to minimize the trend of HIV seroprevalence.

Limitations of the Study:

This study was constrained by small sample size. There is need to step-up the duration during subsequent retrospective studies to give room for larger population size. The documentation and screening processes, data analysis and demography of prospective blood donors must be improved in future similar studies.

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