

Risk factors for HIV seropositivity among first time blood donors in relatives for neurosurgical patients in north India

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ABSTRACT

Exclusion of donors who are likely to be infected with HIV is a sound policy for improving blood safety and reducing operative cost. Factors associated with increased likelihood of HIV infection among newly recruited blood donors are identified and their feasibility as criteria for exclusion from donation is assessed. Method for subject recruitment, and laboratory screening followed usual blood bank protocol. The procedures described in this study are in accordance with guidelines for blood donor recruitment and selection.

Key Words: Blood bank, HIV infection, Blood transfusion, ELISA method.

Abbreviation: HIV - human immunodeficiency virus; ELISA - Enzyme-linked immunosorbent assay; STD - sexually transmitted diseases

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1. INTRODUCTION

Management of Blood donations and donors involves time, investment, costs and risk of transmission of infections if not properly screened or blood issued in window period (before becoming positive for tests). The cost and the chances of infection can be cut down by large margin if proper screening and other precautions are taken. It will also prevent many preventable blood transfusion infections. The study was conducted in north India for seropositivity in 1st time donors coming for Neurosurgical treatment for 15 years.

2. MATERIAL & METHODS

2.1. Study subjects

Where a sample of adult volunteering for blood donation for the first time in hospital or blood bank in neurological practice in 15 years of personal experience. Risk and reasons that individuals should donate were explained to the donor. Persons previously testing positive for HIV, syphilis, hepatitis B, and hepatitis C are deferred. The study represents an attempt to find self reported information that can identify donors, who are likely to be HIV seropositive at the time of interview.

2.2. Survey design and Method

Question about putative risk factor for HIV seropositivity were based on the likelihood of accurate answers, to the question at the time of donations and on risk factors

previously described. The questionnaires began with a series of demographic characteristics including age, marital status, residence of primary partners, residence of donor and type of employment. In addition, the histories of sexually transmitted disease in the last 5 years were recorded. After the pilot testing of the survey among first time donors, minor changes were made to the working and the formatting as the questionnaire.

2.3. Laboratory methods

Usual laboratory testing protocol were followed. Donations are initially screened for HIV antibodies by use of third generation ELISA (HIV1/HIV2) test. Specimen that tested positive is confirmed by retesting with another third generation ELISA test. Only specimen that reacted according to the manufacturer's specifications for both tests were considered positive. The potential impact of the risk factors on donor selection was estimated by comparing, the proportion of HIV positive donors excluded and the proportions of HIV negative donors retained if each risk factor was used as criteria for deferral. A desirable deferral criterion maximizes the number of HIV positive donors excluded, while retaining the maximum number of HIV negative donors.

3. RESULTS

Total 20000 blood donors completing the survey 160 (0.8%) tested positive for HIV antibody by two ELISA. Donors recruited at worksite had higher HIV seroprevalence. Demographic variables associated with increased HIV

Table 1
Estimated performances of risk factors of HIV seropositivity in screening adult donors

S No	Risk Factor	HIV positive / donor deferred %	HIV negative / donor deferred %
1	Work site recruited	58.3	44.3
2	Small town address	7.2	3.7
3	High density urban neighbourhood	74.4	60.8
4	Work as driver or security guard	6	1
5	STD in previous 5 years	9	3
6	Partners reside away from donor	20	9
7	Multiple risk factor	38	10

seroprevalence included greater age, are having married, having primary sex partners who does not reside with the donors, living in high density urban area and work as security guard or driver. Gender was not associated in the sample. Age cutoff was 22 years, most successfully, discriminated between donors with high and low HIV seroprevalence. Reporting STD in the last 5 years was associated with high seroprevalence. Table 1 summary the feasibility of various HIV risk factors as criteria's for deferred from blood donations by examining the percentage of HIV positive donors excluded and percentage of HIV negative donors, retained. Risk factors those performed well included working as driver, STD in previous 5 years, residence of primary partners away from the donors. The proportion of HIV negative donors rejected on the basis of these risk factors was less than the proportion of HIV positive donors excluded for the same risk factors.

4. DISCUSSION

0.8% of subject was HIV positive. Factors significantly associated with HIV seropositivity included recruitment venue, age, marital status, donor residence, residence of primary partners, occupation, history of STD, An exclusion strategy based on these would exclude a large proportion of HIV infected donors without substantial loss of uninfected donors. So exclusion of donors who are likely to be infected with HIV is a sound policy for improving blood safety and reducing operative costs (Kimbal et al.1995). According to recent studies in some part of India 1% of Indians are infected with HIV. The world Health organization has warned if infection rate in general population reaches 1% the Virus spreads very fast (McFarland et al.1997). At present three effective strategies to prevent transfusion, associated HIV transmission are avoidance of unnecessary use of blood, HIV antibody screening and selection of donors at low risk of infection with HIV (Bassette et al. 1992). To facilitate this in India, blood from professional donor is banned who are likely to be infected. HIV seropositivity among first time voluntary adult donor is 0.8% in our practice in last 18 years of practice. New adult donors are responsible for more than ½ of HIV positive donations. The application of more strong selection criteria to new adult donors is likely to produce the largest reduction in HIV seroprevalence in blood donations. The objective of present study was to identify risk factors for HIV infection that could serve feasible criteria for the exclusion of high risk first time blood donor.

The exclusion of donor who is likely to be HIV positive serves, several purposes, even when all donations are

screened for HIV antibodies. Because no test is perfect greater the number of HIV infected units screened, the greater the chances that units that tests false negative in the laboratory will be released for transfusion. Moreover the handling of large no of HIV infected units of blood, increases the likelihood that rise of events of human error (e.g. mislabeling etc) will result in transfusion of contaminated blood or the exposure of blood bank and hospital staff to contaminated blood. In addition the collection of HIV positive donations result in considerable waste of resources, as these units will ultimately be discarded. To some extent, the exclusion of donors who are likely to be HIV infected, but in the window period, must be predictors of new or, incidence of HIV infection. There is also association between HIV infection and socioeconomic condition (Mbizvo et al.1994). Economic conditions have fastened a system of seasonal, internal migration from rural to urban areas (Steinberg et al. 1992). Individuals (mainly men) seek employment in the cities; their spouses remain behind in rural areas. These condition may in turn encourage high risk sexual behaviors (Lackritz et al.1995) The relationship between these factors provide a plausible explanation for the increase seroprevalence observed among donors recruited from worksite, who don't reside with their primary partners, donors providing address in small town and donors residing in high density urban neighborhood. The association between HIV seropositivity and employment as driver is also consistent with the high prevalence of HIV described among truck drivers. History of STD has been conformed as a risk factor for HIV infection in multiple studies and is thought to be marker for engaging in unprotected sex, as well as cofactor facilitating HIV transmission (Sitas et al.1994). Evidence from present study and past experience in the field indicates that large proportion of HIV positive donors could be excluded without dramatic loss of donors overall, and procedure are acceptable to potential donors. survey questions were based on the knowledge of the local epidemiology of HIV infection. Demographic questions such as age, residence, employment, marital status, residence of spouse (away from husband) are likely to be answered more accurately than questions of sexual behavior, that are widely known to be associated with HIV infection. Association with HIV infection and screening performance must be confirmed under local conditions. Risk factors that serve as the most efficient donors criteria may also change overtime as HIV epidemic evolves. Exclusion by HIV risk factor should be considered as an important part of a multifactorial strategy to maximize blood safety that also includes universal HIV antibody survey and sound transfusion practice.

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