

Risk Factors for HIV Seropositivity among First Time Blood Donors in Delhi

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ABSTRACT

We studied the factors associated with increased likelihood of human immunodeficiency virus [HIV] infection among newly recruited blood donors and assessed their feasibility as criteria for exclusion from donation. Of the 20,000 subjects tested, 0.8% were HIV positive. Factors significantly associated with HIV seropositivity included recruitment venue, age, marital status, donor residence, residence of primary partner, occupation, history of sexually transmitted disease. 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 operating costs.

Key words: HIV seropositivity, blood donors

INTRODUCTION

According to recent studies in some parts of India, 1% of Indians are infected with human immunodeficiency virus [HIV] (1). The WHO has warned that if infection rate in general population reaches 1% the virus spreads very fast.

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 (2,3).

The objective of present study was to identify risk factors for HIV infection that

could serve as criteria for the exclusion of high risk first time blood donor.

MATERIAL AND METHODS

The procedure described in this study are in accordance with guidelines for blood donor recruitment and selection.

Study subjects

Adults volunteering for blood donation for the first time at the Safdarjung Hospital, New Delhi were included in the study. Risks and reasons associated with blood donations were explained to the donor. Persons previously testing positive for HIV, syphilis, hepatitis B and hepatitis C were deferred.

Survey design and method

Questions about putative risk factor for HIV seropositivity were based on the risk factors previously described. The questionnaires began with a series of demographic characteristics including age, marital status, residence of primary partner, residence of donor and type of employment. In addition, the history of sexually transmitted disease in the last 5 years was examined. After the pilot testing of the survey among first time donors, minor changes were made to the working and the formatting of the questionnaire.

The present study thus attempts to find self-reported information, that can identify donors, who are likely to be HIV seropositive at the time of initial interview.

Laboratory methods

Usual laboratory testing protocols were followed. Donations were initially screened for HIV antibodies by using third generation ELISA [HIV1/HIV2]. Specimens that tested positive were confirmed by retesting with another third generation ELISA test. Only specimens 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 proportion of HIV negative donors retained if each risk factor was use as a criteria for deferral. A desirable deferral criteria maximises the number of HIV positive donors excluded, while retaining the maximum number of HIV negative donors.

RESULTS

Of the 20000 blood donors completing the survey, 160 [0.8%] tested positive for HIV antibodies by two ELISA tests. Donors recruited at worksite had higher HIV seroprevalance. Demographic variables associated with increased HIV seroprevalance included greater age, being or having been married, having a primary sex partner who does not reside with the donor, living in high density urban area and work as security guard or driver. Gender was not associated in the sample. Age cut-off of 22 years most successfully, discriminated between donors with high and low HIV seroprevalance. Reporting sexually transmitted diseases [STD] in the last 5 years were associated with high seroprevalance.

Table 1 summarizes the usefulness of various HIV risk factors as criteria for deferral from blood donations by examining the percentage of HIV positive donors excluded and percentage of HIV negative donors retained. Risk factors that performed well included working as driver, STD in previous 5 years, residence of primary partner away from the donor. 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.

DISCUSSION

The exclusion of donors who are likely to be HIV positive serves several purposes, even when all donations are screened for HIV antibodies. Because no test is perfect, the greater the number of HIV infected units

Table 1. *Estimated performance of risk factors for HIV seropositivity in screening adult donors*

Risk factor studied	HIV positive donors deferred (%)	HIV negative donors deferred (%)
Worksite recruited	58.3	4.3
Small town address	7.2	3.7
High density urban neighbourhood	74.4	60.8
Work as driver or security guard	6	1
STD in previous 5 years	9	3
Partner resides away from donor	20	9
Multiple risk factor	38	10

STD- sexually transmitted disease

screened, the greater the chances that units that test false-negative in the laboratory will be released for transfusions (4-6). Moreover the handling of large number of HIV infected units of blood increases the likelihood of human errors that 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, may be helpful.

There is also association between HIV infection and socioeconomic condition. Socioeconomic conditions have fastened a system of seasonal, internal migration from rural to urban areas. As individuals [mainly men] seek employment in the cities, their spouses remain behind in rural areas. These conditions may in turn encourage high risk sexual behaviour. The relationship between these factors provide a plausible explanation for the increased seroprevalance 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 neighbourhood. The association between HIV seropositively and employment as driver is also consistent with the high prevalence of HIV described among truck drivers. History of STD has been confirmed as a risk factor for HIV infection in multiple studies and is thought to be market for engaging in unprotected sex, as well as co-factor facilitating HIV transmission.

Evidence from present study and experience in the field indicate that a large proportion of HIV positive donors could be excluded without overall dramatic loss of donors overall. Survey questions were deliberately selected and were based on the knowledge of the local epidemiology of HIV infection. Demographic questions such as age, residence, employment, marital status, residence of spouse are likely to be answered more accurately than questions of sexual behaviour, 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 donor defining criteria

may also change over time 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 anti-body survey and sound transfusion practice.

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