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Research Article

Risk Behavior among Ineligible Blood Donors in a Blood Transfusion Center (Burkina Faso)

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Abstract

Objective

The aim of the study was to compare the prevalence of human immunodeficiency virus, hepatitis B and C viruses among two blood donor populations.

Methods

A cross-sectional descriptive study was conducted over a six-month period. It involved blood donors recruited at fixed and mobile collection sites. Donors were classified into two groups: eligible and ineligible blood donors. Ineligible donors were excluded at the end of the medical interview for reasons of risky behavior. In both groups, the serological markers of the human immunodeficiency virus and hepatitis B and C viruses were searched.

Results

Out of a total of 10,814 blood-donation candidates, 11% (1,191/10,814) were ineligible after the pre-donation medical interview and the risk behaviors represented 4.5% (484/10,814). The median age was 26 years. Donors from mobile sites accounted for 72.8% versus 27.2% for those from the fixed site. Depending on the collection site, there were no significant differences in the serological markers of HIV and hepatitis B and C viruses between eligible and ineligible donors.

Findings

Serological results between fixed and mobile sites are similar. Strengthening selection in mobile sites seems more relevant. While retention of old donors is required, continued counseling among faithful and HIV-negative donors for targeted infections is also recommended.

Keywords: Blood transfusion; Fixed and mobile sites; Ineligible donor; Serological markers

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Introduction

In Burkina Faso, blood transfusion is a therapeutic act of common practice that still carries many risks, particularly the risks of infection. The high prevalence of HIV/AIDS and other blood-borne diseases in the general population poses a major threat to blood safety [1,2]. The safest blood donors are voluntary, regular and unpaid donors. To increase the donor population, it is necessary to recruit young people, to minimize the temporary or permanent rejection of donors without risk and to qualify the non-eligibility of donors over time. Public information about the biological qualification of blood donations is also important for recruitment.

The first step in the transfusion safety process is the recruitment and selection of donors. Indeed, transfusion risk can be greatly reduced if donors are regular, voluntary and unpaid. They must be from a population with a low risk of transmitting an infection through the blood transfusion process [3].

In Africa, in order to keep valuable human and material resources, it is important to use a simple approach, such as the questionnaire, to select the most suitable donors. This questionnaire shall take into account both universal criteria for transfusion safety and epidemiological criteria and local sensitivities. In Burkina Faso, the pre-donation medical interview is a mandatory step in transfusion best practice. This study analyzed the risk behavior among ineligible blood donors from mobile and fixed collection sites after the medical interview and compared the prevalence of human immunodeficiency virus, hepatitis B and C viruses.

Material and Methods

This is a descriptive cross-sectional survey at the regional blood transfusion Center in Ouagadougou (CRTS/O). The study compared the carriage proportions of infection with human immunodeficiency virus and hepatitis B and C viruses in two groups of blood donors.

Blood donors

Blood donors were from the mobile and fixed collection sites and were classified into two groups: eligible and ineligible blood donors. During the collection, risky behaviors were sought among all blood donors via the selection questionnaire which is part of the medical interview. Donors with risky behavior were declared ineligible. In this context, the following elements have been considered as risk behaviors: more than one sexual partner (at least two sexual partners over a period of 6 months, a new sexual partner since the last 3 months, tattoos and scarifications and a notion of drug addiction.

The selection questionnaire, written in French, is based on the French transfusion best practices [4]. However, local and sub-regional epidemiology of infectious diseases has been taken into account in the development of the questionnaire used in Burkina Faso. Included in

the medical history are recent malaria and sickle cell disease. Scarifications have been considered as risk factors for diseases transmissible by blood transfusion [5].

During the various collection phases, the pre-donation medical interview was carried out by a medical or paramedical staff (pharmacists, biologists or general practitioners, nurses) and involved new and old donors. Any subject who presented themselves for the first time in pre-donation interview has been defined as a new candidate. Old candidates were subjects who were at least at their second accepted candidacy for blood donation.

The questionnaire was completed either by the donor himself/herself (alone and before the interview) or, if illiterate, by the health worker during an interview with the candidate. The pre-donation interview consisted of an interview guided by the grid of the pre-donation screening questionnaire, an explanation of the objectives of the medical interview, the course of the donation and the corresponding biological qualification.

For ineligible donors, participation in the study was voluntary and based on a verbal informed consent. Once consent was obtained, donors were screened for serological markers of the Human Immunodeficiency Virus (HIV), and Hepatitis B and C Viruses (HBV and HCV).

Serological analysis

The reagent kits used for the screening of markers were: SD Bioline AgHBs (Standard Diagnostics Inc.) for the detection of the HBs antigen; SD Bioline HCV (Standard Diagnostics Inc.) for the detection of anti-HCV Ac. The Ac-Ag ELISA technique (automate AXSYM from ABBOTT) for the detection of antibodies/antigen (AC/Ag anti-HIV1-2). No confirmatory tests were performed.

Ethical considerations

The participation in the study was voluntary and based on a verbal informed consent. Donors were informed of the possibility of withdrawing their biological analysis results. To comply with anonymity and confidentiality requirements, the results were delivered hand-to-hand. No results were communicated by telephone or in writing.

Statistical analysis

The statistical analysis of the data was carried out using Epi Info version 3.5.3. The classic Chi square of Pearson was used to compare the different proportions. For low numbers and less than 5 we used Fischer's Chi. The threshold of significance was 0.05.

Results

✓ Characteristics of the population

Out of a total of 10,814 blood donors, 95.5% (10,330/10,814) were declared eligible and 4.5% (484/10,814) were ineligible following the interview. The median age was 26 ± 8 years. The sex ratio was 3.2.

✓ Distribution of risk behaviors among ineligible donors is shows in table 1. More than one sexual partner was the common risk behaviors (57%; 277/484)

✓ Positivity of viral contact serological markers

Table 2 compares the positivity proportions of serological markers depending on the characteristics of the study population. Out of a total of 484 ineligible donors, 16% (79/484) had positive serum markers versus 15.6% (1,612/10,330) for eligible donors. No significant differences between the two groups were found for the Ac/Ag HIV, HBsAg and anti-HCVAc.

Grounds for Exclusion	Numbers	Percentage (%)
>1 Sexual partner	277	57
Recent sexual partner	152	31
Tattoos/scarifications/piercing	36	8
Addiction	19	4
Total	484	100

Table 1: Distribution of risk behaviors among ineligible donors.

	Eligible Donors N=9623 (%)		Donors Excluded for Risk Behavior N=484 (%)		P
AC/Ag anti-HIV	160	1.7	7	1.5	NS
HBs antigen	964	10.0	53	11.0	NS
Anti-HCV Ac.	488	5.0	19	4.9	NS

Table 2: Seroprevalence of serological markers in eligible and ineligible donors.

Selected significance threshold: 0.05; NS: No significant

A statistically significant difference was detected for anti-HCV Ac (p=0.006) between donors via a mobile collection site and a fixed site.

Table 3 represents the seroprevalence of serologic markers in ineligible donors depending on the blood collection site and the type of donors. No significant difference was detected.

Positive Serological Markers	Blood Collection Site			Type of Blood Donor		
	Fixed N=98	Mobile N=386	p	Old N=180	New N=304	P
AC/Ag anti-HIV N=7	1	6	NS	1	6	NS
HBs Antigen N=53	8	45	NS	23	30	NS
Anti HCV Ac. N=19	9	10	0.006	9	10	NS

Table 3: Seroprevalence of serologic markers in ineligible donors depending on the blood collection site and the type of donors.

Selected significance threshold: 0.05; NS: No Significant

Discussion

Population characteristics

The age of ineligible blood donation candidates in our study is equivalent to that reported in the literature [3]. It has been shown that in low-income countries, young people are proportionately more likely to be blood donors, with donors under 25 representing 43% of donations [3]. The fact that blood donation candidates tend to be younger in low-income countries is partly related to the fact that the average age of the population is lower than that of Western countries. This is the case in Burkina Faso where the average age is 22 years [3].

Blood donation in Burkina Faso

Burkina Faso promotes the principle that blood donation shall be voluntary and unpaid as is the case in the countries of the European Union (EU). Unlike some EU blood transfusion establishments that conduct blood collection at three types of collection sites (fixed sites, mobile sites and transported mobile sites), two types of blood collection are carried out in Africa: fixed collections practiced at the level

of regional blood transfusion centers and mobile collection in high schools, colleges, universities, companies and places of worship [6]. Fixed sites account for an average of 1.5% of all collection sites. The average percentage is 85% for mobile sites and 13.5% for transported mobile sites [7].

As in the EU, in Burkina Faso, the most effective donor recruitment methods are published announcements, recruitment in large companies, recruitment targeting youth groups, and radio and television broadcasts nationally. However, in Europe, donors with a specific blood group are taken into account.

Assessing the eligibility for donation is an important step in blood donation. The medical screening process for donors making a first donation differs from the medical screening process for regular donors in Europe.

In Burkina Faso, the selection criteria are identical on all sites and for all, whether the potential donor is a regular or occasional volunteer.

The assessment of the existence of risk behaviors and pathologies, biometric measurements and blood sampling for biological qualification tests are standard in all countries. This process of selecting donors may lead to the ineligibility of some of them. The total proportion of exclusion in European blood transfusion establishments ranged from 6 to 28% [7]. It was about 11% in our study population.

Several studies [8-11] have shown that certain behaviors are at increased risk of contamination by severe infectious diseases transmissible by blood. In Africa, seropositivity to hepatitis B and C viruses is very high in blood donors [12-14]. Various tests with different sensitivities and specificities are used in the context of the biological qualification of donation in our context. However, none of them is effective in detecting donors undergoing seroconversion as is the case in developed countries. Indeed, in these countries, the mandatory introduction of viral genome detection techniques at transfusion centers has led to a very significant reduction in the window period.

Because there was no significant difference in the prevalence of serological markers among eligible and non eligible donors a revision of these criteria is advisable. The high cost of serological testing suggests that the focus should be on pre-donation interview in African countries.

Mode of education of the population

In Africa, the practice of collection in public places is widespread. Indeed, for most sub-Saharan countries wishing to substantially increase the number of people able to donate blood, one strategy is to reach out to donors through mobile blood collection sessions. However, these mobile collections are usually an opportunity to recruit casual candidates. In order to create and maintain a safe and sustainable pool of voluntary and regular donors, the strategies put in place should focus on public information about risky behaviors that could compromise blood transfusion safety. The "culture" of voluntary and regular blood donation activities have been developed to recruit many more voluntary donors. These activities include: activities to promote blood donation nationally conducted by the Department in charge of Communication and the promotion of blood donation; activities to promote blood donation during fixed and mobile collections through the blood collection unit; the identification and training of blood donation partners (religious and customary leaders, blood donors associations, communication officers, etc.). In recent years, the training has been extended to other partners, notably the biology teachers in the secondary education schools. These have been identified as being able to actively participate in information and education in favor of blood donation among the young e stages of the population. The method for ensuring donor retention focuses on expressions of gratitude to the donors. Other means considered more effective should be taken into account and may result in letters of thanks, awarding medals or providing medical check-ups.

Conclusion

Since the prevalence of infection in both eligible and ineligible donors are almost same with no significant differences, is it required to introduce an extensive questionnaire for the donors and label them unfit in the first screen. Initiating or maintaining counseling on the targeted infections even for the old donors is equally recommended.

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