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# INFECTIOUS DISEASE MARKERS AMONG DONORS AT PHILIPPINE GENERAL HOSPITAL BLOOD BANK**

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*Abstract*

***Objectives.*** **Preventing transmission of infectious diseases through blood transfusion is one of the greatest challenges of transfusion medicine. This is a cross-sectional study which aims to describe the frequency of infectious disease markers in the blood obtained from commercial blood banks before May 1998 as well as to compare the frequency of infectious disease markers between voluntary and replacement blood donors.**

***Study Design and Methods.*** **All blood donors presenting at the Philippine General Hospital (PGH) blood bank are routinely screened for hepatitis B surface (HBs) antigen, hepatitis C virus (HCV) antibody, rapid plasma reagin (RPR) for syphilis, human immunodefeciency virus (HIV) serology and malaria. Blood donors are classified as replacement (those recruited by the patient, families and friends), volunteer (walk-in donors and mass blood letting) and paid or professional donors coming from commercial blood banks. To determine differences in proportion of infectious disease markers in replacement compared to volunteer donors chi square test was used for HBs and HCV while Fisher exact test was used for RPR, HIV and malaria.**

***Results.*** **A total of 86,079 blood donors screened from April 1997 to December 1999 were included in the study. Donors from commercial blood banks comprised 67% (26,281) of the total number of blood units (39,215) transfused to PGH patients from April 1997 to May 1998. Replacement donors (58,933) made up 98.5% while volunteer donors (865) comprise only 1.5% of the total blood donations from April 1997 to December 1999. Prior to the implementation of Republic Act 7719 otherwise known as National Voluntary Blood Services Act (NVBSA) of 1994, the prevalence of having a positive HBs antigen marker was 0.09% and that of having a positive hepatitis C antibody marker was 0.01%. There was no blood unit which was positive for RPR, HIV and malaria after testing. From April 1997 to December 1999, the prevalence of HBs antigen positive was 7.05% and 7.69% in volunteer and replacement donors respectively (p=0.479). The prevalence of HCV positive blood units was higher among volunteer donors compared to replacement donors (0.92%) versus 0.67%) but this was not statistically significant (p=0.375). There was likewise no difference in the prevalence of RPR, HIV and malaria.**

***Conclusion.*** **Blood units from all donors are potential sources of transfusion-transmitted infectious diseases. The low proportion of infectious disease markers in blood from commercial blood bank reflects a selection bias considering that these units had undergone screening prior to being delivered to Philippine General Hospital. There was no significant difference in the frequency of infectious disease markers for hepatits B, Hepatitis C, syphilis, HIV and malaria among volunteer donors compared to replacement blood donors.**

Keywords: Blood donors, infectious disease markers
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## OBJECTIVES

### A. General

To determine the frequency of infectious disease

markers among blood donors at the Philippine General Hospital (PGH) blood bank.

**B. Specific**

1. To determine the frequency of infectious disease markers for hepatitis B, hepatitis C, syphilis, HIV and malaria in the blood obtained from commercial blood banks before May 1998.
2. To compare the frequency of infectious disease markers for hepatitis B, hepatitis C, syphilis, HIV and malaria among voluntary and replacement blood donors.

## BACKGROUND AND SIGNIFICANCE OF THE STUDY

Despite the many advantages of blood transfusions, the risk associated with the transmission of infection, all immunization (sensitization) to foreign antigens and transfusion reactions remain. In the past decade, dramatic improvements in the methods used for screening blood donors and for testing units of blood have enhanced the safety of transfusions. These improvements were established to minimize the transfusion of blood products contaminated by viruses including human immunodeficiency virus (HIV), hepatitis B (HBV), hepatitis C (HCV), syphilis and malaria. Recent estimates for the risk of transmitting the following viruses through a blood transfusion for HIV-1 are 1 in 420,000; for hepatitis B, 1 in 200,000 and for hepatitis C, 1 in 80,000[2].

In the Philippines, changes in donor recruitment have recently taken place. There was a shift from individual reponsibility to community responsibility for blood replacement and from paid donors to voluntary donors. Organized institutions or groups are rich sources of qualified blood donors. Elimination of paid donors, with increasing use of voluntary blood, units appears to be a definitive trend. Although today's blood supply is less likely to transmit infections than ever before, the public concern that transfusion are dangerous persists. Whenever a decision is made regarding accepting or rejecting a blood donor, these 2 goals should be kept in mind, i.e., safety of donor and safety of patient.

This study focuses on issues of interest in transfusion medicine, including estimates of infection risks in blood products.

## MATERIALS AND METHODS

All blood donors of the Philippine General Hospital from April 1997 to December 1999 were included in this study. Donors were classified as 1.) replacement donors-those recruited by the patient, their families or friends 2.) volunteer donors-those who receive no direct monetary compensation including walk-in donors and from mass blood-letting and 3.) paid or professional donors who come from commercial blood banks.

All blood donors were interviewed with a standard panel of questions about previous illnesses and medical conditions prohibiting donation. They underwent a complete physical examination initially conducted by the physician in the wards or emergency room and verified by the blood bank personnel for replacement donors. Volunteer donors (walk-in and from mass blood-letting) were directly interviewed and examined by blood bank personnel. Blood donors must meet the following criteria: body weight greater than 45 kg, age from 18 to 65 years, general good health, absence of high risk activities predisposing to acquisition of certain infection (i.e., sexual worker, etc.,): no history of hepatitis, jaundice, drug abuse, alcohol intake for the past 12 hours, no history of blood donation for the past 8 to 12 weeks; and hematocrit level greater than 0.38.

Upon passing the initial interview, venoclysis was done for the following serologic tests 1.) Hepatitis B surface antigen using Hepanostiecum and confirmed by EIA-R (ELISA) 2.) Rapid plasma reagin (RPR) for syphilis 3.) hepatitis C virus antibodies using EIA-IMR and confirmed by EIA-ortho 4.) antibodies to HIV type 1 and 2 by EIA, (Vironostika, Genoclavia, Immunocomb) latex agglutination test (Serodia) and Abboth-Determine and confirmed at Research Institute for Tropical Medicine (RITM) using Western Blot Analysis and 5.) malarial smear.

Blood units coming from commercial blood banks were retested for hepatitis B surface antigen, hepatitis C antibody, RPR for syphilis, malaria and HIV serology at PGH blood bank prior to transfusion to the patients. Data was entered into standard logbooks.

## STATISTICAL ANALYSIS

To determine differences in the frequency of infectious disease markers among replacement donors compared to volunteer donors, chi- square was used for HBs antigen and HCV while Fischer exact test was used for RPR, HIV and malaria.

*Table 1.* **Prevalence of infectious disease markers for hepatitis B, hepatitis C, syphilis, HIV and malaria among blood donors in commercial blood banks (CCB) and Philippine General Hospital blood bank, 1997-1999**

| | HBs (%) | HCV (%) | RPR (%) | HIV (%) | Malaria | TOTAL |
|---|---|---|---|---|---|---|
| CBB | 25 (0.09) | 3 (0.01) | 0 (0) | 0 (0) | 0 (0) | 26281 |
| Replacement | 4537 (7.69) | 398 (0.67) | 205 (0.34) | 1 (0.001) | 0 (0) | 58933 |
| VOLUNTEER | 61 (7.05) | 8 (0.92) | 3 (0.34) | 0 (0) | 0 (0) | 865 |
| TOTAL | 4624 | 409 | 208 | 1 | 0 | 86079 |

*Table 2.* **Comparison of infectious disease markers for hepatitis B, hepatitis C, syphilis, malaria and HIV between volunteer and replacement blood donors at the Philippine General Hospital blood bank, 1997-1999.**

| | Volunteer (N=865) (%) | Replacement (N=58933) (%) | p-value |
|---|---|---|---|
| HBs | 61 (7.05) | 4537 (7.69) | 0.479 |
| HCV | 8 (0.92) | 398 (0.67) | 0.375 |
| RPR | 0 (0.34) | 205 (0.34) | 0.645 |
| Malaria | 0 (0) | 0 (0) | 0.986 |
| HIV | 0 (0) | 0 (0) | 0.986 |

## RESULTS

A total of 86,079 blood donors from April 1997 to December 1999 screened were included in the study. Data from January to March 1997 was missing hence was not included. Donors from commercial blood banks comprised 67% (26,281) of the total number of blood units (39,215) transfused to PGH patients from April 1997 to May 1998. (Appendix) This was the period wherein voluntary blood donation was not yet implemented in this hospital. From June 1998 up to the present, blood units transfused are strictly donated by replacement and volunteer blood donors thus discouraging and eventually completely eliminating paid donors.

Replacement donors (58,933) made up 98.5% while volunteer donors (865) coming from walk-in and mass blood letting comprised only 1.5% of the total blood donations from April 1997 December 1999. Prior to the implementation of Republic Act 7719 or otherwise known as National Voluntary Blood Services Act (NVBSA) of 1994, the prevalence of having a positive HBS antigen marker was 0.09%, and that of having a positions hepatitis antibody was 0.01%. There was no blood unit which was positive for RPR, HIV, and malaria after testing. (Table 1)

From April 1997 to December 1999, the prevalence of HBs antigen positive was 7.05% and 7.69% in volunteer and replacement donors respectively (p=0.479). The prevalence of HCV positive blood units was higher among volunteer donors compared to replacements donors (0.92%) versus 0.67%) but this was not statiscally significant (p=0.375). There was likewise no difference in the prevalence of RPR, HIV and malaria. (Table 2)

## DISCUSSION

Blood transfusions are life-saving. The mangement of intensive neonatal care, bleeding patients, hematologic cases, children with cancer and transplant recipients would be impossible without transfusion therapy, Transfusions, however, are not without risks. They should only be given only when true benefits are likely, which is to correct a deficiency or defect of a blood component that has caused a clinically significant problem. The physician must weigh the expected benefits against the potential danger before requesting blood for any patient.

Preventing transmission of infectious diseases through blood transfusion presents as one of the greatest challenges of transfusion medicine. A large number of viruses and other organisms are transmitted by blood. The emergence of acquired immunodeficiency syndrome (AIDS) in the 1980's heightened public awareness of the complications of transfusion, and for the first time, many patients and clinicians became concerned with the specifics of blood collection and testing[3,4]. At present, public awareness of the potential transmission of infectious disease through blood transfusion continues to grow.

Improving blood safety includes not only improved unit testing but also the addition of predonation questions, which increases the likelihood of identifying prospective donors at risk of carrying infection. In order to protect the donor as well as the recipient, each blood donor must be screened prior to each blood donation by medical history and complete physical examination on the day of donation. This is to ensure that no harm will come to the donor by giving blood and that each unit when transfused will not in any way harm the recipient[5].

Before May 1998, blood units from commercial blood banks made up of 67% to the total units tranfused to PGH patients. This is the period prior to the implementation of the Republic Act of 7719 otherwise known as National Voluntary Blood Services Act (NVBSA) of 1994. The act promotes voluntary blood donation, regulates blood banks to ensure an adequate supply of safe blood. and provides penalties for violation thereof. Section 7 of R.A. 7719 advocates the closure of commercial blood banks. Blood units from commercial blood banks are supposedly screened and are expected to be completely free of infection. However, our results show that upon retesting, 25 of 39,215 cases (0.09%) were HBs antigen positive and 3 (0.01%) were HCV positive. This may be due to differences in the sensitivity of the screening tests used, but it may still create a potential risk of transfusing infected blood to the patients.

The seriousness of post-transfusion hepatitis has attracted a great deal of attention for the past 10 years. Sufficient evidence indicates that for the most part the chance of contacting hepatitis from blood obtained from paid donors is greater than from that obtained from voluntary donors[6]. Similar findings are true for non-A, non-B hepatitis which is responsible for the past majority of post-transfusion hepatitis.

Elimination of paid donors with the increasing use of voluntary blood units appears to be a definite trend. From June 1998 up to the present, PGH blood bank has adopted the complete voluntary blood donation policy. Blood units transfused to the patients come from replacement donors (those recruited by patients, families, and friends) or from volunteer donors (walk-in or from mass blood letting). Replacement donors comprises 98.5% while volunteer donors comprise 1.5% of the donor population. The incidence of infectious disease markers for hepatitis B, hepatitis C, syphilis and HIV between volunteer and replacement blood donors at PGH blood bank were the same. This reflects the effective screening process (donation interview, medical history, physical examination) employed by the physicians and blood bank personnel. It has been observed that the replacement donor pool of the Philippine General Hospital are regular donors. Being so, they probably adhere to healthier practices. These repeat donors tend to abstain from high risk activities that might possibly disqualify them from future blood donations. These are usually relatives or friends of patients requiring multiple transfusions i.e. hematologic, oncologic, renal patients. The safety of blood stocks coming from both replacement and volunteer blood donors is the same.

## CONCLUSION:

Blood units from all donors are potential sources of transfusion-transmitted infectious diseases. The low proportion of infectious disease markers in blood from commercial blood bank reflects a selection bias considering that these units had undergone screening prior to being delivered to Philippine General Hospital. There was no significant difference in the frequency of infectious disease markers for hepatitis B, hepatitis C, syphilis, HIV and malaria among volunteer donors compared to replacement donors.

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