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Blood donor recruitment strategies and their impact on blood safety in Egypt ☆

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ABSTRACT

Introduction: Because of the high incidence of HCV, blood safety presents a serious challenge in Egypt.
Given the constrained economy which limits the implementation of nucleic acid amplification technology, proper recruitment of blood donors becomes of paramount importance. To evaluate the effectiveness of blood donor recruitment strategies, the seroprevalence of positive infectious markers among blood donors was studied.
Materials and methods: Donors' records covering the period from 2006–2012 were reviewed. Blood donations were screened for HCV antibodies, HBs antigen (HBsAg), HIV-1 and 2 and syphilis antibodies.
Results: Of 308,762 donors, 63.4% were voluntary donors (VD). VD of 2011–2012 were significantly younger than family replacement donors (RD) .The overall prevalences of HCV antibodies, HBsAg, HIV and syphilis antibodies were 4.3%, 1.22%, 0.07%, and 0.13%, respectively. All tested markers (except HIV) were significantly higher among RD, when compared to VD ($P < 0.0001$). A consistent steady trend for decrease in HCV seropositivity was observed in RD and VD from 8.9% and 4.2% to 3.8% and 1.5%, respectively. A trend for decrease in HBsAg was demonstrated in VD from 1.2% to 0.53%.
Conclusion: The decreasing trends in HCV antibody and HBs antigen is promising and may reflect the improved donor selection criteria.

1. Introduction

Although transfusion of blood can be life saving, it is not without risks. Infectious diseases can be transmitted through blood transfusions. Despite of progress made for prevention of Transfusion-transmitted infections (TTI) over the past few years, they continue to be a problem in many parts of the world [1–4].

Because Egypt has the highest incidence of HCV antibodies in the world, estimated at 14.7%, blood safety presents a serious challenge. Many estimates have been reported, with rural populations having the highest incidence [5–7]. Age and socioeconomic status have been shown in many Egyptian studies to affect HCV prevalence.

The iatrogenic role of parenteral anti-schistosomal therapy campaigns carried out until the 1980s, may have contributed to such high incidence of HCV. Sharing razors, piercing and tattooing were also suggested as possible modes of transmission.

Hepatitis B virus is a major health problem. Egypt has adopted a universal hepatitis B vaccine service for infants since 1992. The primary objective of vaccination is to eliminate chronic HBV infections and ultimately reduce the reservoir for new infections.

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According to the UNICEF the number of HIV detected cases in Egypt is 11,000. There is an evidence of an emerging epidemic in Egypt, particularly among most at risk populations, including injection drug users, female sex workers, men who engage in same sex relations, and children living in the streets.

In general, Cairo University Blood Bank conducts mobile blood drives in universities, educational institutions, military camps, clubs, factories, mosques, football matches and the busy streets of Cairo. Donors are selected according to the American Association of Blood Banking (AABB) eligibility criteria [8].

Because of Egypt's constrained economy which limits the implementation of sensitive screening techniques as nucleic acid amplification technology (NAT), proper recruitment of blood donors becomes of paramount importance.

Modifications in recruitment strategies have been made in the last 4 years, in an attempt to ensure blood safety. Stringent donor selection criteria were employed, excluding those with previous history of schistosomiasis, and those over 50 years of age. We also applied a different strategy for choosing locations for campaigns, excluding rural areas and areas expected to potentially have high-risk donor population. In an attempt to evaluate the effectiveness of blood donor recruitment strategies, the seropevalence of positive infectious markers among blood donors at Cairo University Hospital Blood Bank was studied.

2. Materials and methods

Data were collected from Cairo University Blood Bank. The study was done in accordance with the Declaration of Helsinki. Donors' records covering the period from October 2006 to September 2012 were reviewed. All donations are tested using the following screening tests: Ortho for HCV antibody (enzyme-linked immunosorbent assay test systemVersion 3.0, Ortho Clinical Diagnostics, Inc., Raritan, NJ) and Siemens (Siemens Enzygnost assay, Products, Marburg, Germany) for HBsAg (Enzygnost HBsAg 6.0), human immune deficiency virus (HIV)-1 and HIV-2 antibody (Enzygnost HIV integral II), and syphilis antibody. Positive samples were not confirmed with additional tests.

Seropevalence of positive infectious markers among voluntary donors (VD) and family replacement donors (RD) at Cairo University Blood Bank during the period (October 2006–September 2012) is studied herein.

The age of VD and RD was determined for the period of one year (October 2011–September 2012) and compared.

2.1. Statistical analysis

Standard Statistical analysis of the results was performed. Analysis included descriptive statistics, mean, and SD calculation. The Chi square test and *T* test were used for comparative studies. A *p* value less than 0.05 was considered significant.

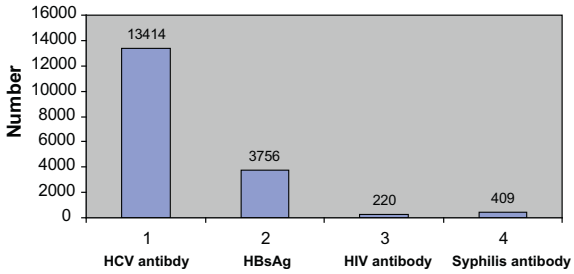

Fig. 1. The overall prevalence of positive infectious disease markers during 6 years (October 2006–September 2012).

3. Results

The overall prevalence of anti HCV antibodies, HBs antigen, HIV antibody and syphilis antibody were 4.3%, 1.22%, 0.07%, and 0.13%, respectively (Fig. 1).

Of 308,762 donors, 63.4% were VD.

The prevalence of positive infectious markers among RD and VD during the period of the study is presented in Table 1.

Except for HIV, all tested markers demonstrated increased positivity among RD as compared to VD ($P < 0.0001$). A consistent steady trend for decrease in the seropositivity for HCV antibodies was observed in both RD and VD from 8.9% and 4.2% in 2007/2008 to 3.8% and 1.5%% in 2011/2012, respectively. A trend for decrease in HBs antigen was demonstrated in VD from 1.2% in 2007/2008 to 0.53% in 2011/2012.

A significant decline of HBs antigen was observed in RD, during 2011–2012, when compared to the previous year ($P < 0.0001$).

During the period between 2007 and 2011, a trend for increase in HIV and syphilis reactivity rates was noted among both RD and VD.

4. Analysis of the age of donors for year 2011–2012

VD were significantly younger with an average age of 26.5 ± 8.4 years than RD with an average age of 32.4 ± 8.3 years ($P < 0.0001$).

The mean age for seronegative donors was 27.34 ± 6.7.

The mean age of HCV positive donors was 36.8 ± 9.6. Forty percent (9550/23,885) of VD were below 25 years while 20.6% (5202/25,257) of RD were below 25 years.

HCV seroprevalence in young subsets (17–24 years) of VD and RD was 1.20% (114 donors) and 1.38% (72 donors), respectively $P = 0.36$.

The mean age for HBsAg positive donors was 28 ± 7.1 years.

The average age for HIV positive donors was 27.2 ± 4.

The average age for syphilis positive donors was 38.6 ± 5.1.

5. Discussion

In an attempt to evaluate the effectiveness of blood donor recruitment strategies, the seroprevalence of positive