

Blood Safety- A global perspective

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Blood safety-A Global perspective.

- In a ceremony held at the New York Public Library on June 26, 2006, Microsoft founder and global health philanthropist Bill Gates expressed his belief that
“there is no reason we cant cure the top 20 diseases”.
- In low-income and lower middle income countries where the per capita gross national product is less than \$3,255, three infectious diseases-TB, HIV and malaria have attracted the greatest attention from international donors.

Blood Safety

- Together they are responsible for 12-13% of deaths in low income countries.
- At least two of these three infectious agents are transmitted through blood transfusions.
- 40-60% of donated blood in developing countries is transfused to pregnant women and children.
- It is estimated that 5-10% of people with HIV were infected via blood transfusions.
 - *AIDS Wkly, 2000 Apr 17-24;:17*

Blood safety

- The focus of this presentation is to
 - describe common challenges facing low income regions
 - one global effort
- Also identify areas where a change could make the biggest difference.

Different countries with similar challenges

- Most of these countries have different histories, but due to civil wars, famine and flooding they have lost their infrastructure.
- Lack physical facilities, equipment and supplies
- Shortage of professionally trained workers.
- Getting the few qualified applicants into the blood program and than retaining them.
- Key to this process is a mechanism that will identify and educate leaders who can than train others.

Global perspective

- Four key areas are identified that are integral to this process:
 - Donor
 - Testing/screening of blood
 - Hemovigilance
 - Overall management arrangements
 - *Transfusion, 2005 Oct;45(4 suppl):224S-40S*

Safe Blood Donor

- The basic principles of blood safety are enough “safe blood donors”.
- A safe blood donor is one who is healthy and has no risk factors for infectious agents.
- The proportion of safe donors is highest in systems where all donors are voluntary.
A condition that exists in less than 7% of less developed countries.
- The leading source of blood in less developed countries is replacement donors who tend to be family members and friends.

Donor History

- In less developed countries there is usually:
 - No donor cards or documentation of health history.
 - Questions related to malaria and hepatitis are asked, with no documentation
 - No questions regarding high risk behavior or I/V drug use are asked.
 - Donor are paid, poor, MSM and I/V drug users.

Prevalence of selected viral infections among blood donors deferred for potential risk to blood safety.

- Health history questions identify blood donors believed to pose a higher risk of transmission of infectious diseases.
- Blood donors deferred for questions regarding risk of viral hepatitis and I/V drug use were more likely to have higher hepatitis marker rates than those who were not deferred.

■ Transfusion Vol 46, Nov 2006

Donor Deferral

- Donors deferred for history of liver disease, positive test for hepatitis or IV drug use were more likely to have higher prevalence for the hepatitis markers.
- Men who have had sex with men (MSM) have been permanently deferred in USA since 1977. The prevalence of reactive screening test results were higher among donors who reported the practice within the past five years.
 - Transfusion Vol 45, March 2005

Blood Safety-Recommendation

- Presenting donors must be interviewed for history of potential exposure to transmissible diseases that are caused by blood borne infections such as HIV, HBV, HCV.
- At blood collection sites, presenting donors are informed of known or newly identified risks of blood borne infection.
- Donors believed at high risk are deferred from making a donation.

Voluntary Donor exclusion

- The safety of blood collected for transfusion starts with appropriate procedures for donor recruitment, education, health history and testing of donated blood units.
- Safe donors are encouraged to donate; whereas at-risk donors are encouraged to self-defer from blood donation.

Transfusion Vol 46, November 2006

Donor Screening

- As part of an effort to monitor the safety of global blood transfusion, the WHO circulates a questionnaire for use in a database on blood safety.
- In 1992, 67% of countries responded to the survey, 100% of all developed countries, 66% of developing, and 46% of less developed were screening all blood donations for HIV antibodies. Only 87% carried out confirmatory testing to confirm positive results.

Donor screening-Pakistan

- In Pakistan 1.5 million units of blood are transfused annually.
- The blood transfusion services are largely hospital based
- It is mandatory to test every blood donation for Hepatitis B, C , HIV, malaria and syphilis.
- There is considerable variation in the standards and blood safety cannot always be guaranteed.
 - Transfusion, Volume 47, January 2007

>HB core testing

- 17% of healthy blood donors are HBV+
- 2/3 showing >HBs Levels over 100mIU/ml
- 1/200 are HBsAg -, >HBc+, can transmit HBV
- No anti HBc testing is routinely performed
- Donor centers need to develop a large pool of HBsAg-and >HBc- donors.
- >HBc testing may be done only on first time donor.
 - Transfusion Vol 47, January 2007

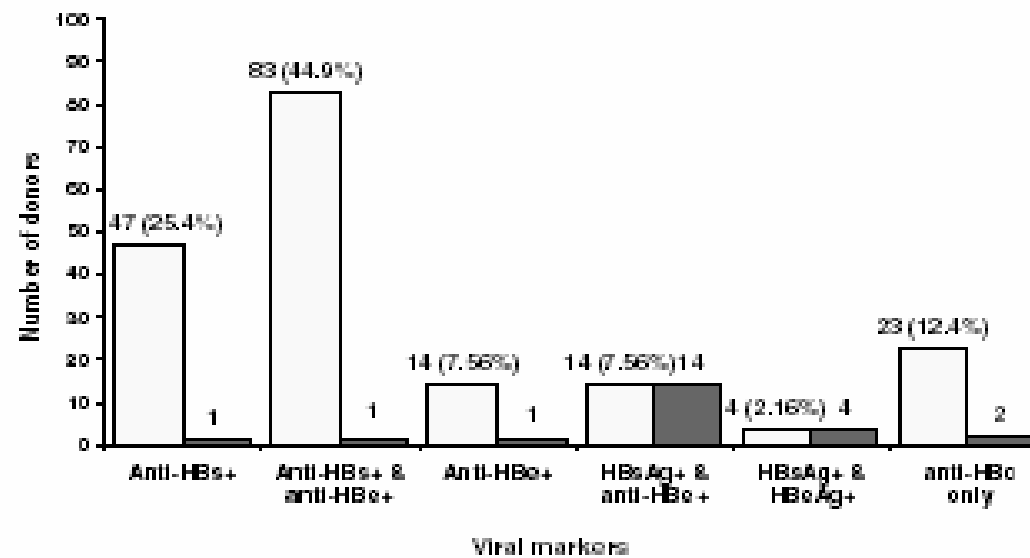


Fig. 1. Serologic markers in anti-HBc-positive (□) blood donors (185/966, ■) HBV DNA-positive individuals with in each category.

Donor screening-Pakistan

- The HbsAg carrier rate is now 2.16 percent.
- Partly due to improved testing and mandatory vaccination of neonates against Hepatitis B.
- Community trends have remained the same. Since the prevalence of HCV shows no decline.

National AIDS Control Program

- Started in 1987
- To prevent the transmission of AIDS through transfusion of blood and blood products
- In most low income countries 0.1% of adult population is HIV positive, between the ages of 20-44 with a M:F ratio of 5:1.
- Incidence of blood contamination is 6.9%

PEPFAR

- A five year, \$15 billion, multifaceted approach to combating HIV/AIDS around the world.
- While 78% of the funding is used to care for and treat HIV/AIDS's. 22% is devoted to prevention
- Within this category 2% of the funding is set aside for blood safety activities.
 - *Presidents Emergency Plan for AIDS Relief*

How does PEPFAR work?

- Work with countries' officials to develop model standards
- Getting necessary equipment and supplies from their own governments is often a challenge.
- Purchases are made through the existing government procurement process.
- PEPFAR works directly with the ministries of health, and ensures that they have input into building their own national blood service.
 - AABB News, January 2007

Setting up sustainable systems

- Increase in the number of voluntary donors decreases the HIV prevalence
- Develop the necessary infrastructure to create long-term self-perpetuating programs.
- Working to strengthen transfusion medical curricula in medical schools
- Working with professional societies to develop clinician education programs on appropriate blood utilization.
- Set of standards that can be used as a framework for decision making and a basis for training.

PEPFAR and Kenya

- The national blood services in several of the African nations working with PEPFAR can show progress in creating safer blood systems
 - Kenya: 80% Voluntary donors,
 - Increase in number of blood donation
 - HIV prevalence in blood donors decreased from 5% to 1.7%

- In, resource-limited environments with competing priorities, blood safety can be an overwhelming luxury.
- In the current atmosphere international donors are motivated to allocate money, send trained professionals and commit themselves to sustainable programs.

Hemovigilance

- “A set of organized surveillance procedures relating to serious adverse or unexpected events or reactions in donors or recipients and the epidemiological follow up of donors.”
- In addition to EU countries, Brazil, Canada, Japan, New Zealand, Russia and South Africa have adopted hemovigilance in place.

Hemovigilance

- In Denmark, data collected on 450,000 blood components transfused during a six year period demonstrated that most adverse events related to incorrect blood components being transfused.
- Transfusion transmitted infection accounted for only a small portion of the risk report.
- Therefore, physician education may be an appropriate focus area for practice improvement.
 - AABB News November/December 2006

Hepatitis B

- To estimate the prevalence of Hepatitis B and associated risk factors.
- Consecutive blood donations made at two large blood banks between January 1998-December 2002
- HBsAg by ELISA III
- Prevalence 2.0%
- Dental treatments, Injections with glass syringe, shaving injuries by barbers.

BB-Karachi

- 95% screened for Hepatitis B
- 55% screened for HIV
- 23% for Hepatitis C
- 29% were storing blood products outside the WHO recommended temperature.
- National legislation in regulating BB has been introduced several times but never been passed.

Hepatitis C

- N=57, 20-70 years male blood donors
- Anti-HCV 2.8% (ELISA)
- Risk factors: Therapeutic injections, face shavings.
 - *Trop Med Int Health 2001 Sep;6(9):732-8*

Blood Bank practices in Pakistan

- 37/87 blood banks were randomly selected
- 24/37 agreed to participate
- 12/24 routinely used paid blood donors
- 8% asked questions about I/V drug use
- No questions about high-risk sexual behavior

Problems

- Reagent kits are expensive
- Technical help is lacking
- Consistency is difficult
- Donor education
- No established exclusion criteria
- No documentation of results

Blood Bank Practices

- Blood services aim to provide a life saving service by ensuring an adequate and safe blood supply.
- Across the world blood services are at different levels of development . Consequently, the actions taken in one country or region may not be feasible in another.

Safe Blood Supply

- Safe and adequate blood supply is needed
- Establish a blood transfusion program
- Donor and public education
- WHO-Global blood safety initiative (GBSI)
- Criteria for transfusion