Blood Transfusion Service in Thailand

Chaivej Nuchprayoon, M.D.,
Director National Blood Center, Thai Red Cross Society, Bangkok, Thailand

Mr. Chairman, Distinguished Guests. Ladies and Gentlemen:

First of all, I wish to express my sincere thanks to the organizing committee in inviting me to participate in this symposium. I personally feel very close to the Japanese, especially the Japanese Red Cross Blood Program through years of cooperation and support.

Introduction

Blood transfusion service has been considered to be an integral part of the health care system in every country. The mission is to supply safe blood in adequate quantity with affordable costs to those who are in need. The operation of blood transfusion service has recently been complicated by two issues, ie the ethical and the medical. On ethical issue, blood is considered to be the gift of life, not a merchandise, because it is part of a human body which is invaluable. Procurement of blood is therefore based on voluntary non-remunerated donation. On medical issue, blood is considered to be a pharmaceutical product which is liable if not properly done. The quality must therefore be assured at all times.

The procurement of blood in industrialized countries, as shown Leikola, was 5 times that in middle income countries and 50 times that in low income countries. The procurement of blood in most developing countries still does not reach the minimal target recommended by WHO, ie. 2% of the population per year.

<table>
<thead>
<tr>
<th>Blood Donation Per Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donation per 1000 pop.</td>
</tr>
<tr>
<td>Industrialized countries</td>
</tr>
<tr>
<td>Middle income countries</td>
</tr>
<tr>
<td>Low income countries</td>
</tr>
</tbody>
</table>

(Leikola: Vox Sang 54: 1-5, 1988)

Thailand is a country in Southeast Asia, bordering by the Indian Ocean and Myanmar in the West, Cambodia and Laos in the East, Laos and Myanmar in the North, Malaysia and the Gulf of Thailand in the South. The country’s total area is approximately 518,000 sq. kms (202,000 sq. mi) and its population is nearly 60 million. The capital is Bangkok in which there are approximately 5.5 million inhabitants.

In the past, health care system in the country was covered mostly by government clinics and hospitals. Presently, private sector begins to take share in health care system, especially in Bangkok. Of 99,000 hospital beds throughout the country, 22,000 are in Bangkok; 6,000 of which are privately owned.

National Blood Program in Thailand started in 1966 as a mission designated by the Government to the Thai Red Cross Society. The formulation of National Blood Program policy are as follows:

1. National Blood Center, TRC is the only organization responsible for national blood program with government support
2. Blood collection should come from voluntary non-paid basis and self-sufficiency should be aimed at provincial level
3. Before dispatch for use, every unit of blood must be tested according to the set standard to maximize safety of blood
4. Appropriate use of blood must be encouraged
5. Users (clinicians) and providers (BTS) must be mutually cooperative to maximize blood collection and minimize wastage.

The National Blood Center, Thai Red Cross Society, was initiated with technical assistance from the French Government and began to function in 1969. Activities consist of recruitment of blood donors, collection of blood, ABO typing and transmissible disease screening, storage and distribution of blood.

In its first decade of operation, emphasis had been on blood donors recruitment and establishment of Provincial Blood Services throughout the country, converting the existing paid donation into non remunerated ones. By the end of the first decade, essential blood component preparations were carried out, eg. packed red cells, platelet concentrates, cryoprecipitates, fresh frozen plasma and fresh lyophilized plasma. In the second decade, strengthening of non-remunerated blood collection and blood components preparation continued. By the end of second decade, a pilot scale of plasma fractionation was initiated. Beginning of the third decade, specialized blood products for clinical use were being prepared, e.g. plasmapheresis, plateletpheresis, frozen red cells, irradiated blood products. Production of blood group reagents by monoclonal antibody technique was also developed. Plasma fractionation products, e.g albumin, HBIG, HRIG are regularly produced and distributed for use, though still in small scale due to limited amount of plasma available.

**Financial Resources**

Operating expenses for the National Blood Center in the past were covered by the government budget. Thai Red Cross budget and public donation. Recently, some of the budget expenses have been recovered from hospitals at cost.

**Collection of Blood and Component Preparation**

Whole blood from first time donors are collected 300 ml in bottles. Those from repeat donors are collected 450 ml in plastic double or triple bags. Bottles, though imported, cost less than plastic bags, and also can be re-used. With a high positive rate (about 8%) of transmissible diseases, e.g. HBsAg, HCV, HIV among first time donors, using bottles help reducing wastage. Blood components, however, can not be prepared from bottles. Collection of blood mostly is from non-remunerated general donations; about 17% are from replacement donation. Annual collection in 1993 was 890,000 units throughout the country, 270,000 of which was from Bangkok. An average rate of collection per population of the country was still below 2%. However, rate per population of Bangkok was about 5.5%.

At the National Blood Center, 70% of blood collection are from mobile buses going to the donors' workplaces. Three different sizes of bus are used. Big coach is convenient but expensive. Minibus is cost effective but requires working space at the workplace which are hardly available at present.

About 45% of total whole blood collection are separated into other four essential blood components at the National Blood Center, i.e. packed red cells, platelet concentrates, fresh frozen plasma and cryoprecipitates.

Specialized blood products, e.g. frozen red cells, single donor platelet concentrates, irradiated blood products, have been developed at the National Blood Center recently.
Donor Recruitment Program and Donor Selection

The National Blood Center's donor recruitment program is being done through several mechanisms:

1. **The Committee for Recruitment and Promotion of Voluntary Blood Donors.** This committee was first organized in 1961, consisting of 20 to 24 members appointed by HRH Princess Maha Chakri Sirindhorn, Vice President of the Thai Red Cross Society to serve as a task force to motivate public for blood donations.

2. **Public Relations and Donor Recruitment Section of the National Blood Center,** who are fulltime staff responsible for making appointment for mobile team to collect blood at donor's workplace such as schools, military barracks, companies, government offices, etc. They also campaign towards general public through various forms of mass media.

3. **Volunteers,** who are field workers, 6-10 in numbers, reaching out to persuade prospective donors to donate blood.

4. **Coordinators,** who are liaison staff of any organization to communicate with the National Blood Center arranging for blood donation at their workplace.

Donor recruitment depends very much on community leaders. About 75% of blood donor in this country are male and 25% are female. The age limit for first time donation are 16-60 years. Those engaged in risk behavior, e.g. IV drug users, male homosexuals, prison inmates, prostitutes, are excluded from donating blood.

Most common blood group is “O” (38%); least common is “AB” (7%); in between are “B” (34%) and “A” (21%). Rh-negative (of all ABO group) is 0.3%, which is much lower than the caucasian donors. This poses some problems to Rh-negative patients when request is on emergency basis.

Routine Blood Screening

Before 1985, routine blood screening consisted of tests for syphilis and HBsAg. Currently, standard blood screening includes syphilis, HBsAg, anti-HCV, and anti-HIV.

The results are as follows:

For all donation, the positive rate for HBsAg was 2.02%; anti-HCV was 0.62%; VDRL was 0.44% and anti-HIV was 0.39%. The positive rate was highest among first time male donors; being HBsAg 7.64%; anti-HCV 1.9%; VDRL 1.1%; and anti-HIV 1.6%.

Currently 6,000 cases of AIDS and ARC have been reported; 18 of which were due to transfusion (before screening). Transfusion thus contributed only 0.3% of total AIDS cases.

There has been verbally reported of at least 10 cumulative cases of HIV infection from screened blood in 1991. HIV antigen screening was therefore implemented since September 1, 1991 to maximize safety of blood in the country. Antibody negative, antigen positive rate is currently about 3/100,000.

Donor Self Exclusion

Self exclusion through questionnaires are also implemented. The anti-HIV positive rate among those who answered "unsafe" was 2.48%, significantly higher than those who answered "safe" (0.46%). The result was, however, not applicable.

Clinical Use of Blood and Components

Clinicians in this country still prefer to use whole blood than blood components, especially the surgeons. Many surgeons still request fresh whole blood. Only 45% of whole blood collection are then
separated into blood components to cover the needs. Seventy seven per cent of the request are for volume replacement. Top of the list is gastrointestinal hemorrhage. Next are trauma and accident, Obstetric and Gynecological problems, and elective surgery. Twenty three per cent of the request are for hematological diseases, e.g. anemia, thrombocytopenia, and hemophilia. Thalassemia is the major cause of anemia which requires blood transfusion in this country. While frozen cryoprecipitates are used for the treatment of hemophilia in Bangkok and nearby provinces, lyophilized fresh plasma is the product of choice for home treatment program of hemophiliacs. Purified factor-8 is very expensive imported product which has been rarely used in this country. HIV infection is therefore uncommon among hemophiliacs in Thailand.

The demand for platelet concentrates increases rapidly in recent years, especially for oncologic patients.

**Summary**

Blood program in Thailand will continue to develop, with regards to safety and adequacy of blood supply. The safety of blood is our primary concern. Establishment of regional laboratory processing centers throughout the country is being implemented which will later transform into comprehensive regional transfusion center. Standardization of quality of blood throughout the country will hopefully be achieved. Heat treated lyophylized cryoprecipitates for home treatment program of hemophilia are now being prepared. PCR laboratory will also established.

Specialized blood products are being developed to accommodate the advanced medical care; e.g. peripheral stem cell collection and marrow donor program are being considered.