The National Blood Program of Taiwan, ROC

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In most developing countries, the establishment of adequate blood bank facilities is of low priority. This was the situation in Taiwan in 1980. At that time, voluntary blood donation was poorly accepted by the medical community, so that it coexisted with a paid donor system. In most hospitals, the blood bank was in the medical microscopy section, which also examined urine and stools. The only pre-transfusion testing performed was ABO cell grouping using anti-A and anti-B and a R\(^+\) T saline slide method for cross matching. Blood component therapy was in its infancy, with only 5% of transfusions using packed red cells, the other 95% using whole blood.

In 1982, an advisory meeting of experts in immunohematology from Taiwan and overseas Chinese drew the attention of the medical community to the importance of a safe blood supply based on voluntary donation, the use of blood component therapy in clinical medicine, and also the need for standardization of blood bank procedures to ensure transfusion safety. In 1984, the Department of Health requested and also funded the Hematology Society, to establish continuing education for blood bank personnel, to develop an inspection program to enforce the use of blood from voluntary donors, and hold seminars in the larger hospitals to introduce the concept of blood component therapy. The ROC Society of Transfusion took over this responsibility immediately after its establishment in 1987.

In 1985 a continuing education program (CEP) was instituted which gave blood bank technologists both theoretical and practical training in immunohematology. Topics included: blood groups; a standard crossmatching procedure using the manual Polybrene method which, based on findings from my laboratory, was found to be the most suitable method for our population; blood components; and transfusion reactions. Since then, about 500 medical technologists from all over Taiwan have participated in this program. In 1988, a similar program lasting 2 days, but with more stress on blood component therapy, was established for physicians who act as consultants for hospital blood banks. In the most recent four years, courses on more sophisticated procedures have been added, such as serological investigation and crossmatching in autoimmune hemolytic anemia, platelet serology, and platelet crossmatching. Also, we discovered that small local hospitals only required training in performing the direct anti-globulin test and standard crossmatching procedures. Therefore a half-day course was held at 4 teaching hospitals around the island, which technologists from smaller hospitals were able to attend. This year, 115 medical technologists attended this course.

Early in 1985, a program for the inspection of blood banks (BB) and blood donation organizations (BDO) was started. This was the first branch of laboratory medicine in Taiwan to have such a program. At the beginning, blood bank inspection was performed independently of accreditation, but since 1989 blood bank inspection has become part of the national health accreditation program. Since 1985 all hospital BB have been inspected 4 times and BDO 3 times. The inspection manual and check list are revised prior to each inspection program and the manual is sent out to every hospital blood bank before the actual inspection, enquiring about personnel, facilities, operation procedures and quality control records. The manual is then returned to the inspector before the actual inspection begins. During the inspection, the inspector examines the blood bank according to the inspection check list. Table 1 is the most recent check list for medical centers and regional hospitals. For small local hospitals we have a different form. The results of this inspection are taken into account for
accreditation and hospital ranking. Since these results influence reimbursement for medical care, hospital administrators have taken the recommendations from the inspections seriously. This has resulted in a dramatic improvement in effective blood component usage, diminished the use of paid donors, improved the quality of work in blood banks as well as increasing the number of personnel, working space, and better facilities.

The first blood bank proficiency test samples were sent out to 69 large teaching hospitals in 1988. The number of hospitals receiving these blood samples has increased ever since, with improved results. Last year we sent samples to 323 hospitals. The results showed that all 13 medical centers identified group A blood with anti-c antibody correctly. Of 48 regional hospitals, 44 hospitals detected the positive antibody screening test with 30 of them also identifying the anti-c antibody. Of 262 small local hospitals, 6 obtained incorrect results in ABO grouping because the sample being sent out was found later to be of the polyagglutinable Cad phenotype. Of these small local hospitals failed to detect the positive antibody screening test.

Despite our island-wide CEP in transfusion medicine, specialized immunohematology techniques are not yet widely available. Therefore, the DOH established an immunohematology reference laboratory in the blood bank of Mackay Memorial Hospital (a private hospital) in 1988, to provide consultation pertaining to hemotherapy for all hospitals. Since then about 100 cases have been referred to the laboratory each year. In consultation with international experts including Dr. Okubo and Dr. Shibata, we have received confirmation for our results and discovered much about blood groups in Taiwan. We have also contributed to transfusion safety through recommendations on national blood policy e.g. including red cells of the Miltenberger MiIII phenotype in our antibody screening cells.

In 1988, the Blood Transfusion Scientific Advisory Committee (under the DOH) was instituted in order to establish a national policy for transfusion services. The inspection program enabled the committee to set standards for BDO. Pressure from the public and the medical community, and also at the request of this committee, led the DOH in 1990 to promote reorganization of the blood donation services with a view to ensuring sufficient blood supplies to meet the ever growing needs of hospitals. The Blood Donation Association was originally established in 1974 under the control of the Department of Internal Affairs. Under this reorganization, the association, although independent of the government, remains under the Department of Internal Affairs but is responsible only for donor recruitment. All other functions, such as collection, processing and distribution of donated blood is now the responsibility of the Blood Services Foundation, under the DOH.

Blood donations have increased dramatically, especially since 1988. Last year 1,242,535 units were donated. With Taiwan's population of about 20 million, that represents a donor population of 5.96%. Of all donated units about 90% were made into various blood components. Voluntary donations met close to 100% of Taiwan's hospital needs last year.
HBV positive donations decreased from 9.58% in 1987 to 5.78% in 1993, partly as a result of decrease in the number of first time donors but also due to screening of the general population during the past few years and so, individuals who already know that they are HBV positive are less likely to come to donate. Using a 2nd generation EIA method for anti-HCV testing 0.87% donors were found to be positive. Only 21 out of 1,242, 535 donors (0.002%) were found to be anti-HIV-1 positive (Western blot proved) and 0.14% donors were found to be STS positive with confirmation by TPHA.

Hospital blood bank standards were established in 1986 and updated in 1990. In 1989, all teaching hospitals were required to establish a transfusion committee in order to achieve the highest standard of patient care.

However, we still have a long way to go. All that has been accomplished, as well as what we hope for the future, would not have been possible without the dedication and hard work of all our colleagues in Taiwan, including the Department of Health, medical centers and blood donation associations.