National Blood Transfusion Service Sri Lanka

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Population—Sri Lanka is an Island republic, with an area of 65,610 sq. km, and an estimated population of 17.5 million.

Type of Organization—The National Blood Transfusion Service (NBTS) is government managed, with a Director who functions under the Deputy Director General Laboratory Services, the Director General Health Services, the Secretary and the Minister of Health & Women’s Affairs.

Number of Blood Centres—The NBTS which was established in 1962 with a Central Blood Bank (CBB) and one Regional Blood Bank (RBB), has now expanded to include 35 RBB and 12 Emergency Bleeding Centres (EBC).

The CBB which has a staff of 117 functions as a routine Blood Centre for 3 large hospitals nearby, in addition to administration, logistics support and monitoring work performance of the RBB & EBC. Blood Component preparation for 16 hospitals, and reagent production, tissue typing & quality control for the NBTS are among the other functions together with the provision of a reference service & training.

The RBB are situated in the larger, and EBC in the smaller hospitals. The facilities available in these two categories of blood centres are basically the same, with the exception that the RBB are managed mainly by NBTS staff and EBC by hospital staff, who have all been trained at the CBB. EBC are upgraded to RBB by appointing NBTS staff, as and when the workload increases. The RBB & EBC with a total staff of 306, function as blood centres for their respective hospitals. All blood components are prepared at 8 large RBB accessible to 19 hospitals, and some of the components at 17 smaller RBB for their respective hospitals.

There are 3 private Blood Banks which supply part of the blood requirements of private hospitals.

Donor Recruitment—for the CBB is done by the Donor Recruitment Division which has a Public Relations Officer (PRO) as the head. The PRO arranges monthly field blood donation programmes in advance, with 45-55 centres, and 4 mobile unit teams are sent to collect blood at these centres. The mobile units cover all parts of the country except the North and East.

41% of the total number of donors recruited by the NBTS in 1992 & 1993 was by the CBB and 73% of the donors recruited by the CBB was recruited in the field i.e. voluntary donors. In contrast 92% of the donors recruited at the CBB were replacement donors with only 8% voluntary donors. Similarly, 90-99% of donors recruited at the RBB & EBC were replacement donors. Of the total number of donors recruited by the NBTS 37% were voluntary and 63% replacement. Blood was not collected from paid donors after 1986.

The PRO has also arranged field programmes for the larger RBB which are unable to cope with blood collection from replacement donors.

Financial Resources—the NBTS is funded by an allocation from the Ministry of Health. The allocations for 1992-1994 are as follows:

Price of Blood Units—blood is issued free of charge to patients in non-paying wards of hospitals. A subsidised charge which does not even cover the cost of the blood bag and administration set is levied for patients in paying wards of government hospitals. (250 ml) unit—Rs. 120/- & 450 ml unit—Rs. 140/-. However, a higher charge covering the costs is made for private hospitals. (250 ml unit
The charges of private blood banks are much higher (Rs. 950/- Rs. 1200/- per 450 ml unit). Criteria for Donor Selection—the NBTS collects blood from non-remunerated donors, which include voluntary and replacement donors. However, the “hidden” system which exists in all developing countries where the patient or the relatives pay donors, is found in Sri Lanka too. Staff are alerted to this problem during their training, and instructed to reject such donors and provide blood from stocks for the patient.

The age range for blood donation is 18-55 years, and the minimum weight is 95 lbs. The haemoglobin level must be at least 12 grams for both males and females, and is tested by the Copper Sulphate method (specific gravity 1.052).

The donors are given a leaflet on AIDS for self exclusion, and are required to sign a Certificate of Fitness stating that they have not had any of the illnesses mentioned therein, including HIV infection. This also includes a declaration that they have read the leaflet on AIDS, and they do not belong to a high risk group for HIV infection. Criteria for donor selection are included in a document which is available at all the blood centres.

Amount of Blood Drawn per Donation (ml) and Intervals Between Donations—the volume depends on the weight. From males between 95-110 lbs and from females between 95-120 lbs. 250 ml of blood is collected. If the males are >110 lbs and females are >120 lbs, 450 ml of blood is drawn. The interval between donations is 3 months for both sexes.

Laboratory Testings for Collected Blood (the ear and date of introduction)—all blood collected by the NBTS is tested as follows:

a) Blood Grouping

(i) ABO grouping—is done by the tube technique. Cell grouping is done using anti-A, anti-AB and anti-B and serum grouping using A1 cells and B cells, from 1963.

(ii) Rhesus typing—is done by the tube technique using anti-D, and if blood is D negative, the sample is tested with anti-CDE and a D<sup>a</sup> test is done, from 1963. A unit of blood is labelled as Rh negative only if it is D negative, CDE negative and D<sup>a</sup> negative.

b) Compatibility Testing—is done in tubes, and the technique includes a saline crossmatch at room temperature, an albumin (22% bovine) crossmatch at 37°C and the indirect Coombs’ test, from 1963.

c) Screening for Transfusion Transmitted Infections—

(i) Syphilis—by the VDRL test, from 1962.

(ii) Malaria—by Direct Microscopy (thick & thin blood film), from 1975.

(iii) Hepatitis B—HBsAg by Radioimmunoassay at the CBB from August 1985, and at the RBB & EBC by the Reversed Passive Haemagglutination (RPHA) test, from late 1987.

(iv) HIV/AIDS—anti-HIV by ELISA, Particle Agglutination and Immunodot on blood collected by the CBB from April 1988 and then extended to include several RBB & EBC each year so that in 1993, all the RBB and 99.96% of the blood was tested. The 0.04% untested blood was in war areas to which test kits could not be transported regularly.

Number of Donations per Year—the number of blood donations increased steadily over the past 5 years from 50,688 units (450–500 ml) from 62,676 donors in 1989 to 79,466 units from 102,063 donors,
in 1993. Approximately 60% of blood collected by the NBTS is in 450 ml units, and 40% in 250 ml units.

All blood is collected as whole blood and 67% of the 450 ml units were processed into components in 1992 & 1993. The NBTS has no facilities for automated plasmapheresis.

Distribution of Blood & Blood Products per Year (in units)—1992 & 1993—

An analysis of the distribution of whole blood and red cell products from the NBTS in 1992 & 1993, revealed that 91-92% of the blood was transfused to patients in government hospitals, 4-6% to patients in armed services hospitals and 2% to patients in private hospitals. (Private Blood Banks supply 65% of the blood requirements of private hospitals). 1-2% of the blood was not transfused.

Of the blood transfused in government hospitals 34-37% was to patients in surgical wards, 22% to patients in medical wards 24-25% to patients in obstetrics and gynaecology wards and 17-19% to paediatric patients.

A total of 88,001 cellular and plasma components prepared by the NBTS in 1992 was accessible to 35 government hospitals and 102,542 components prepared in 1993 to 39 such hospitals. 2% of the blood components were transfused in private hospitals and <1% in armed services hospitals.

Transfusion Transmitted Diseases Positive Rate Among Donors—

a) Hepatitis B—a total of 510,596 donors were screened for HBs antigen from 1986-1993, and 479 were confirmed as positive. The positive rate is 1 in 1000 (0.1%).

b) Hepatitis C—blood is not screened routinely for HCV antibody. Two pilot studies done in collaboration with JICHI Medical School, Japan in 1993 on random donor samples revealed that 7 out of 300 donors and 10 out of 1755 donors were antibody positive i.e. 0.8%. The 7 positive samples in the first study were HCV-RNA negative.

c) HIV/AIDS—a total of 388,491 donors were screened for HIV antibody from April 1988 to December 1993, and 9 donors were confirmed as positive. The positive rate is 1 in 43,000.

HBV, HCV, HIV Transmission Through Transfusion to Recipients

a) HBV—3 cases of HBV transmission have been reported to date. Other risk factors could not be ruled out in 2 of these patients.

b) HCV—no cases have been reported to date.

c) HIV—no case of HIV transmission after blood transfusion in Sri Lanka has been reported to date. However, two patients who received blood transfusion abroad were found to be positive for HIV antibody.

Consumption of Albumin (Kg) per Million Inhabitants per Year—(1992 & 1993)—there are no facilities for plasma fractionation. No albumin was imported in 1992 & 1993 as it could not be obtained. However, 300 bottles of 5% Albumin (250 ml) which were imported in late 1991 at a cost of 41 US dollars each were used in 1991 & 1992, together with 500 bottles of Plasma Protein Fraction PPF (250 ml) imported in 1992. Albumin and PPF are used only for plasma exchange and for patients who develop reactions to plasma, due to the high cost. Therefore the consumption of Albumin was only 0.13 kg and 0.03 kg per million inhabitants per year for 1992 and 1993, respectively.

Consumption of Factor VIII (i.u.) per Million Inhabitants per Year—only a small quantity of solvent-detergent treated lyophilised Factor VIII concentrate was imported in 1992 & 1993, for patients who develop reactions to cryoprecipitate, due to the high cost (45 U.S. $ per 250 i.u. vial). Therefore the consumption was only 2300 i.u. and 4286 i.u. per million inhabitants per year in 1992 & 1993, respectively.

AIDS Problems in Transfusion Medicine—careful donor selection strategies, together with testing blood for HIV antibody and importation of only heat/solvent-detergent treated blood products from 1987 appears to have been effective in maintaining an “HIV safe” blood supply in Sri Lanka,
to date. The current problem is funds to purchase HIV test kits which were hitherto provided by the WHO, UNDP and ADB.

Problems in the Blood Programmes at Present and in the Near Future—the present problems are staff shortages, mainly technical and nursing officers, limited budget and grossly inadequate accommodation for the CBB and larger RBB.

The introduction of microtechniques initially and later automation in the laboratories with computerization, at the CBB followed by updating the RBB are problems for the future.

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