

ORIGINAL ARTICLE

**Human Immunodeficiency Virus
Seroprevalence in Children Received Multiple
Transfusions or Blood Products in the
Department of Child Health Faculty of
Medicine University of Indonesia/
Dr. Cipto Mangunkusumo General Hospital,
Jakarta.**

by

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Abstract

From March 1987 till February 1988, 350 serological examinations to HIV antibodies have been carried out. Sera were taken from children visiting the Department of Child Health Faculty of Medicine University of Indonesia/Dr. Cipto Mangunkusumo General Hospital, Jakarta, who had received blood or blood products transfusions more than three times. All blood or blood products were made locally by the Indonesian Red Cross in Jakarta, except for Human immunoglobulin and Koate.

The age ranged from 9 months to 22 years with a mean age of 8,02 years. They consisted of 207 males and 143 females; 33 patients with hemophilia, 250 patients with thalassemia, 41 patients with blood malignancy, and 26 patients with other diseases.

Sera were tested by a commercially available ELISA HIV assay produced by Abbott (macro ELISA) and Behring (micro ELISA). Repeatable positive sera were confirmed by Western blott.

The majority of patients in this study got their first transfusion on more than 5 years ago with a high consumption of blood components, namely 16.252 units of packed red cells, 6111 units of cryoprecipitate, 537 units of thrombocyte suspension, 96 units of fresh frozen plasma, 35 units of human immunoglobulin, and 15 vials of Koate.

Two out of 350 sera were repeatable positive for HIV antibody but confirmatory test by Western blott were negative. One sera was from a 17-year-old girl with thalassemia who had received 129 units of packed red cells transfusions since 1979, and the other was from a 2-year-old girl with chronic myelocytic leukemia who had received 24 units of packed red cells. The rest of the sera were negative.

This zero prevalence finding suggests that in Indonesia transfusion of blood or blood products still plays a limited role in the epidemic of AIDS in children.

Introduction

Since Gottlieb et al. (1981) reported AIDS in the United States, more cases on AIDS becoming available all over the world. But reported cases from Asia were still scanty. In Indonesia no cases of AIDS has yet been reported except for imported cases. Widjanarko and others in 1987 reported from 8311 workers for employment in Saudi Arabia who were screened for HIV antibody, 18 were reactive twice by ELISA method. Five out of the 8 positive sera were also positive for HIV antigen but at the time of the examination they did not show any clinical symptoms of AIDS yet and confirmation test by the Western blot method was not done.

AIDS has been reported also in infants and children. Unlike in adults, the transmission in infants and children is mostly through vertically from infected mother (79%) and transfusion of blood or blood products (19%) (Rogers et al., 1987).

In Indonesia screening of blood donors for AIDS is not a regulation yet. So multiple blood transfusions or blood products can still be one of the risk factors for the development of AIDS. In this connection the authors tried to do the serological investigations to find out how far the HIV antibody was present in patients who had received blood transfusions or blood products.

Materials and Methods

This study was carried out on children visiting the Department of child Health Dr. Cipto Mangunkusumo General Hospital, Faculty of Medicine University of Indonesia, Jakarta. They suffered from various kinds of diseases which can be divided into 4 groups:

- Group I : patients with hemophilia
- Group II : patients with thalassemia
- Group III : patients with blood malignancy
- Group IV : patients with other diseases.

They had received blood transfusions or blood products more than 3 times for the anemia or bleeding. Every transfusion of blood or blood products was considered as one unit transfusion. All blood or blood products were made locally by the Indonesian Red Cross in Jakarta, except for Human Immunoglobulin which was produced by Sandoz (Swiss) and Koate by Cutter (USA). Blood was taken by venapuncture with the parents's consent. Five ml of blood was taken and sent to the

Department of Clinical Pathology of Dr. Cipto Mangunkusumo General Hospital, Faculty of Medicine University of Indonesia, Jakarta. Enclosed was a form containing the running numbers and identity of the patients.

Blood was allowed to clot and then centrifuged. Sera separated from blood clot were put into covered bottles and stored in a freezer with a temperature of -20°C . Later on sera were tested for antibody to HIV by a commercially available enzyme-linked immunosorbent assay produced by Abbott (Macro ELISA) and Behring (Micro ELISA), in duplicate. If one or both results were positive, the test were repeated (also in duplicate). If one or both were still positive the test was reported as repeatable positive. Repeatable positive sera will be confirmed by Western blot. A specimen was considered positive if confirmation by Western blot was positive, and negative if the Western blot was negative.

Results

From March 1987 till February 1988, 350 serological examinations have been carried out. The patients consisted of 207 males and 143 females. The majority of them (250 out of 350) were patients with thalassemia (see table 1) and only 26 with

other diseases such as idiopathic thrombocytopenic purpura, Henoch-Schonlein purpura, iron deficiency anemia, and megaloblastic anemia. The age ranged from 9 months to 22 years with a mean age of 8,02 years.

Table 1 : Number of patients by disease group and sex

Group	Male	Female	Total
Group I	33	0	33
Group II	139	111	250
Group III	24	17	41
Group IV	11	15	26
Total	207	143	350

Note : Group I : patients with hemophilia
 Group II : patients with thalassemia
 Group III : patients with blood malignancy
 Group IV : patients with other diseases

Table 2 : Number of patients by disease group and age

Group	< 1	1—5	Age groups (years)			
			6—10	11—15	16—20	20
Group I	—	12	15	6	—	—
Group II	1	67	121	44	13	4
Group III	1	14	19	6	1	—
Group IV	—	6	12	7	1	—
Total	2	99	167	63	15	4

The total number and type of transfusions given were obtained from the out-patient medical record from 1979 till February 1988. It is illustrated in Table 3.

Table 3 : Number of units of blood and blood products used by disease group

Group	WB	PRC	Blood or blood products				HIG
			CRY	FFP	TRB	KOATE	
Group I	—	146	6111	96	—	15	—
Group II	—	15.282	—	—	—	—	—
Group III	2	364	—	—	300	—	—
Group IV	3	460	—	—	237	—	35
Total	5	16.252	6111	96	537	15	35

Note : WB = whole blood
 PRC = packed red cells
 CRY = cryoprecipitate
 FFP = fresh frozen plasma
 TRB = thrombocyte suspension
 KOATE = Anti hemophilic globuline
 HIG = Human immunoglobulin.

There were 16.252 units of packed red cells transfusions, whereas 15.282 out of them were given to patients with thalassemia in group II, 6111 units of cryoprecipitate transfusions, 537 units of throm-

bocyte suspension transfusions, 96 units of fresh frozen plasma transfusions, 35 units of human immunoglobulin transfusions and 15 vials of Koate transfusions.

Table 4 shows that 123 patients had their first transfusion history on more than 5

years while only 41 patients had on less than 1 year.

Table 4 : Number of patients studied by the duration of their first transfusion history and disease group

Group	Duration of the first transfusion history (years)			
	1	1—2	3—5	>5
Group I	6	8	7	12
Group II	20	66	57	107
Group III	13	26	1	1
Group IV	2	15	6	3
Total	41	115	71	123

Table 5 reveals that 2 out of 350 sera showed repeatable positive for antibody to HIV but confirmatory test by Western blot were negative. One sera was from a 17-year-old girl with thalassemia who had received 129 units of packed red cells transfusions since 1979, and the other was from a 2-year-old girl with chronic myelocytic leukemia who had received 24 units of packed red cells transfusions. The rest of the sera were negative.

Table 5 : HIV seroprevalence by disease group

Group	Number of patients	ELISA (repeatable +)	Western blott (+)
Group I	33	0	—
Group II	250	1	0
Group III	41	1	0
Group IV	11	0	—
Total	350	2	0

Discussion

According to Curren et al. (1984), AIDS can be transmitted by blood but the number of cases is small, only about 1% of the reported cases of AIDS in the United States. In their study, the time between transfusion and onset of illness ranged from 10 to 43 months. While Tedder in 1986 illustrated that seroconversion occurred within 3 months after infection. Peterman et al. (1985) reported that blood components associated with transmission of AIDS were red cells, platelets, plasma, and whole blood. Habibi in 1985 stressed out that concentrate factor was a high risk factor for transmission of AIDS because this preparation was made out of hundreds even thousands of donors.

Rogers et al. (1987) reported that about 20% of the children with AIDS had received

one or more transfusions of blood or blood products.

Mann and others (1986) found that 4 out of 23 patients (17%) with sickle cell disease receiving blood transfusions were HIV seropositive. They observed also that 6,3% of 854 blood donors at Mama Yemo Hospital, Kinshasa, were HIV seropositive.

The majority of patients in this study (35,1%) had their first transfusion story on more than 5 years ago with a high consumption of blood components namely 16.252 units of packed red cells and 6111 units of cryoprecipitate. From this point of view our patients actually should already have a high risk for HIV infection, but in this study the results were still negative. This suggest that in Indonesia transfusion of blood or blood product are still not an

important factor in the transmission of AIDS.

The 2 positive results detected by the ELISA method may be due to a cross reaction between granulocytic antibodies or other proteins present in the patients and the ELISA HIV assay. Marianpu (1986) reported that a false positive reaction to HIV assay can be detected in children with multiple transfusions. He found that 4 out of 95 children with thalassemia were positive for HIV antibody with the ELISA

method, but none had any other evidence of AIDS. Their patients had 50 to 300 transfusions each and they believe that the result is due to a cross reaction between granulocytic antibodies which are common in the thalassemics and the ELISA HIV assay.

However it is considered still necessary to follow up the 2 patients with repeatable positive sera and to make a further investigation to support the conclusion of this study.

Conclusion

The prevalence of HIV antibodies among 350 children in the Department of Child Health Dr. Cipto Mangunkusumo General Hospital, Faculty of Medicine University of Indonesia, Jakarta, who had received multiple transfusions of blood or blood

products locally made was zero.

This finding suggests that in Indonesia the transfusion of blood or blood products still plays a limited role in the epidemic of AIDS in children.

Acknowledgment

The authors are grateful to Professor A.A. Loedin, Head of the National Institute of Health Research and Development, Ministry of Health of the Republic of

Indonesia, for his assistance in conducting this study. Without his help this study is just impossible.

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