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Human Immunodeficiency Virus Infection in Transfusion Recipients and Their Family Members

(Based on and reproduced, with acknowledgement, from *Morbidity and Mortality Weekly Report* of the Centers for Disease Control, U.S. Public Health Service (1987) 36, no. 10, 137-140)

The Centers for Disease Control have received a report of human immunodeficiency virus (HIV) infection among multiply-transfused leukaemia patients in New York City. In addition, there have been several reports that persons with transfusion-associated HIV infection have transmitted the virus to their sexual partners and newborn children. All infected transfusion recipients described in these reports had received blood or blood components before routine screening of donated blood for HIV antibody was begun in USA in the spring of 1985.

Multiply-Transfused Leukaemia Patients

During the past year, four long-term leukaemia survivors at Memorial Sloan-Kettering Cancer Center in New York City developed unexplained fever, weight loss, diarrhoea or lymphadenopathy. They subsequently had positive serological tests for HIV antibody. A retrospective study of other multiply-transfused leukaemia patients was conducted to determine how many had been infected with HIV. Informed consent was obtained from all living patients. Positive enzyme immunoassay (EIA) tests were confirmed by Western blot assay. Patients known to have other risk factors for HIV infection were excluded from the study.

Sera were located for 182 deceased and obtained from 22 surviving leukaemia patients treated during the years 1978-1986. Sixteen of these transfusion recipients were seropositive for HIV antibody (Table 1). They had received a mean of 27 units of packed red blood cells (range 2-56) and 137 units of platelets (range 10-483). Forty-five per cent of these 204 patients had acute myelogenous leukaemia; 20% had acute lymphocytic leukaemia; 13%, chronic myelogenous leukaemia; 4% chronic lymphocytic leukaemia; 6%, myelodysplastic syndromes; and 12% other or unclassified leukaemias. There was no correlation between type of leukaemia and the presence of HIV antibody. An additional 23 newly diagnosed, untreated and untransfused leukaemia patients were tested and all were seronegative.

TABLE : HIV serology results in leukaemia patients, by year of specimen collection - Memorial Sloan-Kettering Cancer Center, New York City

Years	Total number of patients tested		Number with positive test			Estimated* risk per component
1978-80	86	(55M, 31F)+	0	(0%)		0.00%
1981-83	77	(39M, 38F)	9	(12%)	(6M, 3F)	0.07%
1984-86@	41	(21M, 20F)	7	(17%)	(2M, 5F)	0.10%
Total	204	(115M, 89F)	16	(8%)	(8M, 8F)	0.05%

* Estimated risk based on an average of 164 components per recipient

\+ M = males; F = females

@ These patients were treated before screening of blood products began in USA in March, 1985; 22 long-term survivors, four of whom were seropositive, are included.

Additional Case Reports from Other Areas

Case 1: An elderly man without known risk for AIDS received multiple units of blood in early 1982, including one from a donor who subsequently proved to be positive for HIV antibody. The recipient developed *Pneumocystis carinii* pneumonia (PCP) in 1983 and died in 1984. His wife, who did not have any other risk factors for AIDS, had had vaginal intercourse with him until he became ill in late 1982. In late 1984, her HIV antibody test was positive and she was diagnosed as having a type of lymphoma indicative of AIDS.

Case 2: A pregnant woman without other risk factors for AIDS received four units of blood in 1978, including one from a donor who later proved to be positive for HIV antibody. A son was born in 1980 but from 13 months of age failed to thrive and died with PCP in 1986. The woman, her son, her husband and the child born shortly after the transfusion all tested positive for HIV antibody.

MMWR Editorial Note: At present, prevention of HIV infection and AIDS is dependent in USA upon deferral of blood or plasma donation by persons at increased risk for AIDS; testing of donated blood and plasma for HIV antibody; heat treatment of clotting factor concentrates; avoidance of unprotected sexual contact and needle sharing by persons infected with HIV; and prevention of perinatal transmission by infected women. Counselling and HIV-antibody testing have been recommended for persons at risk for infection (including homosexual/bisexual men, intravenous drug abusers, haemophilia patients, prostitutes and persons who have had sexual contact with members of these groups). Routine counselling and antibody testing have not been recommended for blood transfusion recipients because, in general, their risk for infection is extremely low. However, as illustrated by this report (and others) some multiply-transfused persons may be at a higher risk for HIV infection. In addition, some persons with transfusion-associated HIV infection have transmitted the virus to their sexual partners and, perinatally, to their infant children.

Although the number of infected transfusion recipients in the United States is unknown, it can be approximated using estimates of the prevalence of infection in donors, the efficiency of transmission and the number of units transfused per year. In 1985, 0.04% of donations were positive for HIV antibody by Western blot assay. If 0.04% had been the seroprevalence among donors in the year prior to screening, if all seropositive units had transmitted infection and

if each seropositive unit had gone to a different recipient, then 7,200 of the approximately 18 million components transfused in 1984 (American Blood Commission, unpublished data) might have transmitted infection. If 60% of these recipients have died from their underlying disease then approximately 2,900 living recipients who acquired a transfusion-associated HIV infection in 1984 would remain. Most of these would be asymptomatic. The number of infected donors was probably lower in earlier years. Mathematical projections from reported transfusion-associated AIDS cases estimate that approximately 12,000 people now living in the United States acquired a transfusion-associated HIV infection between 1978 and 1984.

Blood-banking organizations in the United States have begun "look-back" programmes to identify previous recipients of blood from donors who tested positive for HIV antibody after screening began. In one region, 70% of recipients identified through such a programme had HIV antibody. However, look-back programmes cannot identify all infected transfusion recipients because many infected donors may have refrained from donating or become too ill to continue to donate after HIV serologic testing of donors began.

The risk of HIV transmission by transfusion was low, even before screening, and has been virtually eliminated by the routine screening of donated blood and plasma. However, since HIV-infected persons are at risk themselves for developing AIDS or related conditions and may transmit infection to others, physicians in USA should consider offering HIV antibody testing to some patients who received transfusions between 1978 and late spring of 1985. This consideration should be based on the likelihood of infection in a recipient and the likelihood of transmission from that recipient. The risk of infection is greatest if the recipient received large numbers of transfusions and if the blood was collected during the few years before screening in an area with high incidence of AIDS. (The leukaemia patients in this report received many units of blood and blood components in an area with a higher prevalence of HIV than most parts of the United States, so their seropositivity rate is higher than would be expected in other patients. Conversely, persons who received a small number of units in a low prevalence area would have an extremely low risk of HIV infection). Testing is particularly important if the patient is sexually active. Since the overall prevalence of infection in transfusion recipients is expected to be low, the positive predictive value of EIA screening tests for HIV antibody will be much lower than that seen when testing high-risk populations. Therefore, all transfusion recipients with a positive EIA should also have their serum tested by a second method (Western blot assay, immunofluorescence assay) before they are informed of their test result. Seropositive persons should be evaluated for signs and symptoms of AIDS or related conditions and counselled regarding the avoidance of HIV transmission to others.

Acquired Immune Deficiency Syndrome (AIDS) - United Kingdom

The distribution of UK cases by transmission categories at the end of April 1987 are summarised in Table 1.

TABLE 1

Transmission Categories		Cases			
		Male	Female	Total	Deaths
Homosexual/bisexual		652	-	652	355
Intravenous drug abuser		10	2	12	6
Homosexual and IV drug abuser		8	-	8	4
Haemophilia		30	-	30	23
Haemophilia and IVDA		1	-	1	1
Recipient of blood :	abroad	5	4	9	6
	UK	3	2	5	5
Heterosexual - presumed infected :	abroad	13	7	20	11
	UK	1	4	5	4
Child of HIV-antibody 'positive' parent		3	4	7	4
Other		-	1	1	1
Total		726	24	750	420

The distributions of the Scottish registered cases and deaths, by transmission categories, for the same period are summarised in Table 2 (these figures are included in the UK figures of Table 1).

TABLE 2

Transmission Categories		Cases			
		Male	Female	Total	Deaths
Homosexual/bisexual		14(a)	-	14(a)	7(a)
Intravenous drug abuser		1	1	2	1
Homosexual and IV drug abuser		-	-	-	-
Haemophilia		2	-	2	1
Recipient of blood :	abroad	1(b)	-	1(b)	1(b)
	UK	1	-	1	1
Heterosexual - presumed infected :	abroad	-	-	-	-
	UK	-	-	-	-
Child of HIV antibody 'positive' parent		-	-	-	-
Other		-	-	-	-
Total		19	1	20	11

(a) includes two visitors from outside UK
(b) not blood transfusion