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Seroepidemiological Survey of Anti-Human T-cell Leukemia Virus-Type I Antibodies in Western Samoa*

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Abstract

A seroepidemiological survey of Anti-human T-cell Leukemia virus type I (HTLV-I) antibodies was conducted on Western Samoa human sera in 1993～1994. The result showed no positive cases in all 1953 samples.

Key words: Seroepidemiology, Adult T-cell leukemia/lymphoma (ATL), Anti-human T-cell leukemia virus type I (HTLV-I) antibodies, Western Samoa

Introduction

Adult T-cell leukemia/lymphoma (ATL) is caused by infection of a retrovirus, human T cell leukemia virus type-I (HTLV-I). It is observed in high incidence among persons born in virus endemic areas, such as south-western Japan, the Caribbean basin, Central Africa, southern part of India, north-eastern part of Australia and Papua New Guinea. A neurological disease, HTLV-I associated myelopathy/tropical spastic paraparesis (HAM/TSP) is also caused by the same virus. It is said that many diseases are associated with HTLV-I infection. (HAB= HTLV-I associated bronchopneumonopathy, HAAP= HTLV-I associated arthropathy, malignancies, etc.)

Many investigators have been making efforts to identify the ATL cases and HTLV-I carriers, and their results showed that there are many HTLV-I positive cluster countries in the world. Almost all the ATL patients and the carriers of HTLV-I are positive for anti-human T-cell leukemia virus-type I antibodies (anti-HTLV-I antibodies) in their sera. The anti-HTLV-I antibody examination of the inhabitants in each country will help to detect and monitor the incidence of leukemia and the transmission of the virus.

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* The Samoa Parliament passed the law to amend the Constitution changing the country's name from Western Samoa to Samoa in 1997.

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Material, Method and Results

The human sera were collected as available samples from Western Samoa National Hospital Clinical Laboratories (Biochemical Laboratory and Microbiological Laboratory) and Western Samoan Blood Transfusion Section, Apia, Western Samoa. The serological test was done by the Microtiter Technique using a gelatin particle agglutination test (Serodia HTLV-I kit, FUJIREBIO INC., Tokyo, JAPAN). The HTLV-I positive range was determined over 16 units of serum samples concentration by this qualititative test. A total of 1,953 samples were tested. The distribution of samples by age and sex are shown in Table 1. As for 316 out of the 1,953 cases, the age or the age and sex was unclear. The results of the present seroepidemiological study on Anti-HTLV-I antibody in Western Samoa showed no positive cases in all samples (Table 1).

Table 1. Distribution of Sample Material by Age and Sex with Incidence of Positive Cases for Anti-HTLV-I Antibodies

Age	Male	Female	Positive Cases
0-10	15	15	0
11-20	105	129	0
21-30	206	204	0
31-40	113	140	0
41-50	111	108	0
51-60	79	84	0
61-70	78	58	0
71-	49	43	0
Age or Age&Sex Unknown	316		0
Total	1,953		0

Discussion

The adult T-cell leukemia/lymphoma (ATL) is caused by an infection of a retrovirus, HTLV-I (HINUMA et al., 1981). Anti-HTLV-I antibodies in human sera are detectable in most ATL patients and are in a relatively high percentage in healthy individuals born in ATL-endemic areas (TAJIMA et al., 1984). Currently it is supposed that HTLV-I is transmitted by three main routes; 1) sexual transmission (TAJIMA et al., 1982), 2) vertical transmission (HINO et al., 1985), and 3) blood transfusion (OKOCHI et al., 1983). It is suspected that there are 1.2 x 10^5 carriers in Japan, and ATL-endemic areas are the south-western areas of Japan where healthy carriers were found at a rate between 6% and 37%

(TAJIMA et al., 1979; HINO et al., 1982). The West Indies/Caribbean basin, Columbia, Brazil, southern India, Papua New Guinea, north-eastern Australia and central parts of Africa are also known as HTLV-I invaded areas (BLATINER et al., 1982; CATOVSKY et al., 1982; O'BRIEN et al., 1983; TAJIMA et al., 1992). In the United States the incidence is sporadic and most of the patients are black Americans.

A few seroepidemiological surveys have been made in Oceania. There was a reported 1.1% anti-HTLV-I antibodies positive cases in the Solomon Islands (HINUMA et al., 1983). Another survey reported 0% in the Solomon Islands and Viti Levu (Fiji) of Melanesia (TERASHI et al., 1983). Yet another survey reported 0% in the Fiji (NICHOLSON et al., 1992). But in Papua New Guinea at Port Moresby, Lae and Wewak of Melanesia showed a range of 6.9-30.2% positive cases (TERASHI et al., 1991; TERASHI et al., 1992). There was a reported 0% in Truck State (TERASHI et al., 1986), 1.9% in Pohnpei (TERASHI et al., 1986), 6.8% in Yap State of the Federated States of Micronesia (TERASHI et al., 1987a). In the Republic of Palau of Micronesia it was reported at 10.8% (TERASHI et al., 1987b).

Polynesia is not known as an area that has been invaded by HTLV-I. In some studies, no antibody was detected in sera from American Samoa, the Cook Islands, French Polynesia (NICHOLSON et al., 1992) and Hawaii (TAJIMA et al., 1992). A study revealed 0.07% positive cases in French Polynesia (CHUNGUE et al., 1993). USHIJIMA et al. (1990) reported there were no positive cases in Tonga and Western Samoa. Our present exhaustive study also showed no positive cases in Western Samoa. The incidences of anti-HTLV-I antibodies in Micronesia and Melanesia and its absence in Polynesia including Western Samoa suggests certain patterns of socio-cultural interaction and early human migrations in the Pacific Basin. However, further research, is necessary to ascertain these relationships.

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