

Seroepidemiological Study of Anti-Adult T-cell Leukemia Associated Antibodies in Western Samoa

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Abstract

A seroepidemiological survey of Adult T-cell Leukemia associated antigen antibodies was conducted on Western Samoan human sera in 1993.

The results showed no positive cases in all 812 samples.

Key words: Seroepidemiology, Adult T-cell Leukemia, Western Samoa

Introduction

Adult T-cell Leukemia(ATL) is related to the infection of a retrovirus named Human T-Lymphotropic Virus Type-1(HTLV-1) and is observed with a high incidence among persons born in virus endemic areas, such as southwestern Japan, the Caribbean basin and Africa. A neurological disease, named HAM/TSP (HTLV-1 Associated Myelopathy/Tropical Spastic Paraparesis) was also caused by HTLV-1(MATSUMOTO *et al.*, 1979; OSAME *et al.*, 1987)

Nearly all the patients and many of the carriers of HTLV-1 who are in a healthy condition will test positive for ATLA(anti-ATL virus associated antigen antibodies) in their sera (HINUMA *et al.*, 1981). The ATLA examination of the inhabitants in each country will help to detect and monitor incidence and transmission of the virus.

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Methods and Results

The human sera were collected as available samples from Western Samoan National Hospital Clinical Laboratory (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-1 kit, FUJIREBIO Inc., Tokyo, Japan; IKEDA *et al.* 1984). The HTLV-1 positive range was decided over 16 units of serum samples concentration by this qualitative test.

A total of 812 samples were tested.

The results of the seroepidemiological study of ATLA in Western Samoa showed no positive cases in all samples.

The distribution of samples by sex and age are shown in Table 1. In 17 cases the ages were unknown, and in 5 cases neither the age nor sex were available.

Table 1. Distribution of Sample Material by Sex and Age

Age	Male	Female	Total
0~10	11	11	22
11~20	45	55	100
21~30	76	96	172
31~40	59	72	131
41~50	46	49	95
51~60	49	47	96
61~70	48	35	83
71~80	18	10	28
81~	7	6	13
Adult	31	19	50
Age Unknown	11	6	17
Age & Sex Unknown	(5)		5
Total	401	406	812

Discussion

The adult T-cell leukemia/lymphoma(ATL) is caused by an infection of a retrovirus of HTLV-1. Anti-ATL-associated antigen antibodies (ATLA) in human sera are detectable in most ATL patients and in a relatively high percentage of healthy individuals born in ATL-endemic areas.

Currently it is supposed that HTLV-1 is transmitted by three main routes; 1) from husband to wife by sexual transmission, 2) from mother to her babies by delivery, and 3) blood transfusions (MIYAMOTO *et al.*, 1985; TAJIMA *et al.*, 1982; OKOCHI *et al.*, 1984).

In Japan, ATL-endemic areas are the southwestern regions where healthy carriers were found at a rate between 6-37 % (HINUMA *et al.*, 1982). In Okinawa, the southernmost part of Japan, 51 of 170 patients including 20 ATL patients were positive for ATLA (CLARK *et al.*, 1985).

In neighboring countries, 17 out of 2,545 individuals in Taiwan (PAN *et al.*, 1985), 17 out of 6,255 in Korea (LEE *et al.*, 1986) and 2 out of 6,884 in China (ZENG *et al.*, 1984) were reported as ATLA positive cases. Each report was composed of healthy persons and patients with various diseases. One of the two ATLA positive cases in China was a Japanese-Chinese and the other was a Chinese woman whose husband was a Japanese.

The West Indies/Caribbean basin is also known as an HTLV-1 invaded area. And many of ATL patients were black peoples born in these HTLV-1 endemic areas (CATVOSKY *et al.*, 1982; BLATTNER *et al.*, 1982; O'BRIEN *et al.*, 1983). Africa is thought to be one of the HTLV-1 endemic areas (GALLO, 1985; HUNSMANN *et al.*, 1983).

The incidence of ATL in the USA is sporadic. While most of the patients were black, their birth places were widespread in the United States and Latin America (JAFFE *et al.*, 1984; BLAYNEY *et al.*, 1983).

However, a few of these cases were white (JAFFE *et al.*, 1984; FOUCAR *et al.*, 1985).

Few seroepidemiological surveys have been made in Oceania. HINUMA *et al.* (1983) reported two sporadic ATLA positive cases in 182 samples of the Solomon Islands. In the other surveys no positive cases were found in the Solomon Islands nor Viti Levu (Fiji) where 72 and 156 sera, respectively were collected (MATSUMOTO *et al.*, 1983; TERASHI *et al.*, 1983).

In Truck State of the Federated States of Micronesia (FSM), no positive cases out of 57 persons were found (TERASHI *et al.*, 1986). Elsewhere in the FSM, 3 tested positive out of 154 individuals in Pohnpei (TERASHI *et al.*, 1986), and in Yap State there were 9 positive reactions out of 133 inhabitants (TERASHI *et al.*, 1987a).

In the Republic of Palau, 19 positive cases out of 176 sera were found (TERASHI *et al.*, 1987b).

An ATLA research survey in Papua New Guinea at Port Moresby, Lae and Wewak showed a range of 6.9 -30.2% positive cases (TERASHI *et al.* 1991; 1992).

The incidence of ATLA in Micronesia and Papua New Guinea, and its absence in Western Samoa, suggest certain patterns of socio-cultural interaction and early human

migrations in the Pacific Basin. Further research, however, is needed to ascertain these relationships.

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