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SEROEPIDEMIOLOGICAL STUDY OF ANTI–ADULT T–CELL LEUKEMIA/LYMPHOMA ASSOCIATED ANTIBODIES AND ISOLATION OF THE LEUKEMIA VIRUS FROM HUMAN LYMPHOCYTES IN PAPUA NEW GUINEA

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Introduction

Adult T–cell Leukemia/Lymphoma (ATL) is related to the infection of one type of retrovirus named Human T–Lymphotropic Virus Type–I (HTLV–I) and is observed with high incidence among persons born in virus endemic area, such as southwestern Japan, the Caribbean basin and Africa.

Nearly all the patients and many of the carriers of HTLV–I who are in a healthy condition will test positive for ATLA (anti–ATL virus associated antigen antibodies) in their sera (HINUMA et al., 1981). An ATLA examination of the inhabitants in each country will help to detect and monitor the virus. And isolation of HTLV–I succeded from cultivated human lymphocytes (POIESZ et al., 1980).

Methods and Results

The human sera were collected from ANGAU Memorial Hospital (Medical Laboratory, National Cancer Treatment Center Headquaters Papua New Guinea and Sexual Transmitted Diseases Section) in Lae of Morobe Province and Dr. T. TALONU Medical Laboratory in Port Moresby of Central Province.

The serum test was done by the Microtiter Technique using a gelatin particle agglutination test (Serodia–ATLA kit, FUJIREBIO Inc., Tokyo, Japan; IKEDA et al., 1984). The ATLA positive range was decided over 16 units of serum materials concentration by this test.

The isolation and characterization of HTLV–I from human peripheral lymphocytes was carried out by an ordinary tissue culture method.

The results of the seroepidemiological study on ATLA is shown in Table 1. Eight persons out .of 29 testing samples (27.6%) tested positive for ATLA using the materials of ANGAU Memorial Hospital and so did 4 cases out of 55 sera (7.3%) at Dr. T. TALONU Medical Laboratory.

The samples from the Memorial Hospital showed a much higher percent of ATLA positive cases than that of the Medical Laboratory samples. This is because one group contained many native Papua New Guinean and the other foreigner's sera.

Table 1. Seroepidemiological study on Adult T-cell Leukemia/lymphoma in Papua New Guinea (1989).

Name of laboratory	No. positive/total no.
ANGAU Memorial Hospital (Medical Laboratory)	8/29
(Morobe Province)	(27.6%)
Dr. T. TALONU Medical Laboratory	4/55
(Central Province)	(7.3%)

Discussion

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

Currently it is supposed that HTLV-I is transmitted by three main routes; 1) from husband to wife, 2) from mother to children, 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 high rate 6-37 (HINUMA et al., 1987). In Okinawa, the southernmost part of Japan, 51 cases in 170 patients including 20 ATL patients tested 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 case. Each population was composed of healthy persons and patients with various diseases. One of the two ATLA positive cases in China was 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-I invaded area. Although there were some reports of ATL patients from no HTLV-I endemic, all of them were black patients born in these endemic areas (CATVOSKY et al., 1982; BLATTNER et al., 1982; O'BRIEN et al., 1983). Africa is thought to be an HTLV-I endemic area (GALLO, 1985; HUNSMANN et al., 1983).

In reports from the USA about sporadic ATL, most of the patients were black, but their birth places were widespread in the United States and Latin America (JAFFE et al., 1984; BLAYNEY et al., 1983). However, a few white patients were included in these reports (JAFFE et al., 1984; FOUCAR et al., 1985).

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

In the Federated States of Micronesia, no positive cases out of 57 persons in Truck State were found and 3 tested positive out of 154 individuals in Pohnpei (TERASHI et al., 1986), and 9 positive reactions out of 133 inhabitants of Yap State (TERASHI et al., 1987a) were detected for ATLA in the sera. In the Republic of Palau, nineteen positive cases out of 176 sera were found from inhabitants in our research work (TERASHI et al., 1987b).

The isolation of retroviruses from human lymphocyte with ATLA positive tests in the sera and its DNA analysis of the virus were also reported (ALBERT et al., 1987).

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