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

Shinichi TERASHI$^1$, Motoo KITANO$^2$, Yasuto UCHIO$^3$, Hideharu KUNIYOSHI$^4$, Taulealea Eti ENOSA$^5$, Faalii ALOAINA$^6$ and Vaasili Faleniu ASAUA$^7$

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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1) Kagoshima University Research Center for the South Pacific, Professor Address:1-21-24 Korimoto, Kagoshima-City, JAPAN 890
2) Kagoshima University, Faculty of Dentistry, Oral Pathology, Professor
3) Kagoshima University, School of Allied Medical Sciences, Chemistry, Professor
4) Kagoshima University Hospital, Faculty of Dentistry, Research Associate
5) Western Samoan National Hospital, Research Committee, Chairman
6) Western Samoan National Hospital, Superintendent
7) Western Samoan National Hospital, Chief Pathologist
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

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


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