Seroepidemiology of HTLV-I Infection in Northeast Thailand : A Four Year Surveillance

YUPA URWIJITAROON, M.Sc.*,**, SAHAWAT BARUSRUX, M.Sc.*,**,
CHINTANA PUAPAIROJ, M.D.*, AMORNRAT ROMPHRUK, M.Sc.*,
PRAWEE KHAMPEERA, Cert*.

Abstract

The human T-lymphotropic virus type I (HTLV-I) can be transmitted through blood transfusion, sexual contact, perinataly and by breast feeding. We carried out a four years seroepidemiology surveillance study of HTLV-I infection among northeast Thai population by screening for antibodies to HTLV-I (anti-HTLV-I) in 1992, 1993, 1995 and 1997. A total of 8,323 blood samples were collected from 6,228 blood donors, 823 pregnancies, 219 multitransfused patients, 53 HIV positive intravenous drug users and 1,000 northeast-Thai workers at different periods of time. The serum samples were tested for anti-HTLV-I by particle agglutination (PA) technique and confirmed by Western blot. One sample from a multitransfused patient collected in 1992 and one sample from a blood donor collected in 1995 demonstrated positive anti-HTLV-I screening by PA but negative by Western blot. This finding indicates that at present HTLV-I is not a public health problem in the northeast of Thailand but surveillance should be continually conducted.

Human T-lymphotropic virus type I (HTLV-I) is a retrovirus which is associated with adult T-cell leukemia/lymphoma, tropical spastic paraparesis and HTLV-I associated myelopathy (1-3). HTLV-I can be transmitted through blood transfusion, sexual contact, perinatal and by breast feeding(4-8). Endemic areas for HTLV-I infection include southwestern Japan, the Caribbean islands, intertropical areas of Africa(9-11). The highest prevalence rate of anti-HTLV-I was found to be 37.5-44.5 per cent in Okinawa but only 0.025-0.058 per cent in blood donors of the United States(12-14). The techniques for screening of anti-HTLV-I include enzyme immunoassay and the particle agglutination (PA). The confirmation tests are Western blot, immunofluorescence and radioimmunoprecipitation assay(15-17).

We carried out a seroepidemiology surveillance study of HTLV-I infection among the northeast Thai population by screening for antibodies to

* Blood Transfusion Centre, Faculty of Medicine,
** Department of Clinical Immunology, Faculty of Associated Medical Sciences, Khon Kaen University, Khon Kaen 40002, Thailand.

Table 1. Anti-HTLV-I in Northeast-Thais in four years surveillance study.

Year	Blood donors No.+ve/No.tested	Pregnancies No.+ve/No.tested	Multitransfused patients No.+ve/No.tested	HIV+ve IVDU No.+ve/No.tested	Workers No.+ve/No.tested	Total No.+ve/No.tested
1992	0/1536	NT	1*/149	0/53	NT	1*/1738
1993	0/2206	0/403	NT	NT	NT	0/2609
1995	1*/1876	0/300	0/70	NT	NT	1*/2246
1997	0/610	0/120	NT	NT	0/1000	0/1730
Total	1*/6228	823	1*/219	53	1000	2*/8323

NT = not tested
* = positive by PA but negative by Western blot

HTLV-I (anti-HTLV-I) in the year 1992, 1993, 1995 and 1997. The results may be useful for prevention and control particularly for the safety of blood transfusion.

MATERIAL AND METHOD

Study population

Serum samples were randomly collected from blood donors in the Blood Transfusion Centre and patients in Srinagarind Hospital, Faculty of Medicine, Khon Kaen, University, Khon Kaen province which is located in the northeastern part of Thailand. A total of 8,323 blood samples were collected from 6,228 blood donors, 823 pregnancies, 219 multitransfused patients, 53 HIV positive intravenous drug users (HIV+ve IVDU) and 1,000 workers who checked up for a health certificate. The specimens were collected at different periods of time as follows : in 1992 from January to September, in 1993 from August to October, from September to October in 1995 and from March to April in 1997. The details of different samples collected in each year are presented in Table 1.

Detection of anti-HTLV-I

Screening technique

All of the serum samples were screened for anti-HTLV-I by particle agglutination (PA technique (Serodia HTLV-I : Fujirebio Inc, Tokyo, Japan). The repeatedly reactive by PA were confirmed by Western blot (Problot HTLV-I: Fujirebio Inc, Tokyo, Japan). The procedure and interpretation of particle agglutination and Western blot were carried out following the manufacturor's instructions.

RESULTS

The results of anti-HTLV-I screening in different groups of a northeast population are shown in Table 1. One sample from a multitransfused patient collected in 1992 and one sample from a blood donor collected in 1995 demonstrated positive anti-HTLV-I by PA but negative by Western blot. The rest of the serum samples collected in 1992, 1993, 1995 and 1997 were found to be negative for anti-HTLV-I by PA.

DISCUSSION

All of the 8,323 serum samples from different northeast Thais tested for anti-HTLV-I over different periods of time in 1992, 1993, 1995 and 1997 demonstrated no confirmed positive case of HTLV-I infection. The negative result of this finding is correlated with the result of the study conducted in Bangkok, Thailand during 1987-1988 in a limited number of patients with myelopathy[18] and supports the finding of Chiewsilp et al[19] who studied Bangkok blood donors and multitransfused patients during 1992-1993. However, the first report of a positive finding of anti-HTLV-I from the study in 1040 gynecologic disorder patients was at Siriraj Hospital, Bangkok in 1992[20]. The positive anti-HTLV-I patient was married to a Chinese man who immigrated from China, he was also positive for anti-HTLV-I but their daughter showed negative anti-HTLV-I.

The negative finding from our 4 year surveillance study in 8,323 northeast-Thais in addition to the study in Bangkok[18,19] indicates that at present HTLV-I infection is not a public health

problem in Thailand. However, since the virus can be transmitted by sexual contact and transfusion transmitted tropical spastic pararesis caused by HTLV-I has been reported[21], the surveillance study for HTLV-I infection among Thai population should be continually conducted.

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REFERENCES

1. Blattner WA, Takatsuki K, Gallo RC. Human T-cell leukemia-lymphoma virus and adult T-cell leukemia. JAMA 1983; 250: 1075-80.
2. Gessain A, Vernant JC, Maurs L, Barin F, Gout O, Calender A. Antibodies to human T-lymphotropic virus type-I in patient with tropical spastic paraparesis. Lancet 1985; 2: 407-9.
3. Sakai Y, Yao H, Sadoshima S, Fujishima M, Okochi K. Development of HTLV-I associated myelopathy (HAM) in a seroconverted patients for antibody to HTLV-I. J Neural Neurosurg Psychiatry 1989; 52: 1445.
4. Okoshi K, Sato H, Hinuma Y. A retrospective study on transmission of adult T-cell leukemia virus by blood transfusion : Seroconversion in recipients. Vox Sang 1984; 46: 245-53.
5. Kimihira S, Nakasima S, Oyakawa Y, et al. Transmission of human T-cell lymphotropic virus type-I by blood transfusion before and after mass screening of sera from seropositive donors. Vox Sang 1987; 52: 43-4.
6. Kajiyama W, Kashiwagi S, Ikematsu H, Hayashi J, Nomura H, Okochi K. Intrafamilial transmission of adult T-cell leukemia virus. J Infect Dis 1986; 154: 851-7.
7. Hin S, Sugiyama H, Doi H, et al. Breaking the cycle of HTLV-I transmission via carrier mothers' milk. Lancet 1987; 2: 158-9.
8. Murphy EL, Figueroa JP, Gibbs WN, et al. Sexual transmission of human T-lymphotropic virus type I (HTLV-I). Ann Intern Med 1989; 111: 555-60.
9. Aoki T, Miyakoshi H, Koide H, et al. Seroepidemiology of human T-lymphotropic retrovirus type-I (HTLV-I) in residents of Nigata Prefecture, Japan : comparative study by indirect immunofluorescence microscopy and enzyme immunosorbent assay. Int J Cancer 1985; 25: 301-6.
10. Blattner WA, Kalyanaraman VS, Robert-Gouroff M, et al. The human type C retrovirus HTLV in black from the Caribbean region and relationship to adult T-cell leukemia/lymphoma. Int J Cancer 1982; 30: 257-64.
11. Bigger R, Johnson B, Oster C, et al. Regional variation in prevalence of antibody against human T-lymphotropic virus type I and II in Kenya East Africa. Int J Cancer 1985; 25: 763-7.
12. Blattner WA, Nomura A, Clark JW, et al. Mode of transmission and evidence for viral latency from studies of human T-cell lymphotropic virus type I in Japanese migrant populations in Hawaii. Proc Natl Acad Sci U.S.A. 1986; 83: 4895-8.
13. Faun CT, Williams AE, Sandler SG, Slamon DJ. Poiesz BJ. Detection of antibodies to human T-lymphotropic virus type I (HTLV-I). Transfusion 1988; 28: 179-83.
14. Lee HH, Swanson P. Rosenblatt JD, et al. Relative prevalence and risk factors of HTLV-I and HTLV-II infection in US blood donors. Lancet 1991; 337: 1435-9.
15. Verdier M, Denis F, Leonard G, et al. Comparison of immunofluorescence, particle agglutination, and enzyme immunoassay for detection of human T-cell leukemia virus type-I antibody in African sera. J Clin Microbiol 1990; 28: 1988-93.
16. Fujino R, Kawato K, Ikeda M, Miyakoshi H, Mizukoshi M, Iami J. Improvement of gelatin particle agglutination test for detection of anti-HTLV-I antibody. Jpn J Cancer Res 1991; 82: 367-70.
17. Kline RE, Brothers T, Halsey N, Boulos R, Lairmore MD, Quinn TC. Evaluation of enzyme immunoassays for antibody to human T-lymphotropic virues type I/II. Lancet 1991; 337: 30-3.
18. Hemachudha T, Phanuphak P, Sirivichayakul S, Phanthumchinda K. Serum antibodies to HTLV-I in Thai patients with chronic progressive myelopathy, multiple sclerosis, myopathy and in HIV-seropositive intravenous drug abusers. Asian Pac Allerg Immunol 1989; 7: 33-5.
19. Chiewsilp P, Iamsilp W, Hathirat P. HTLV-I antibody screening in donated blood and thalassemic patients. J Med Assoc Thai 1993; 76 (Suppl. 2): 103-5.
20. Roongpisuthipong A, Suphanit I, Yamaguchi K, Nakamitsu M, Yoshiki M. Very low seroprevalence of HTLV-I patients with gynecologic disorders in Thailand. J Acquir Immune Defic Syndr 1992; 5: 1066.
21. Menitove JE. Blood donor HTLV-I antibody testing. Transfusion 1989; 29: 1-2.

การติดเชื้อ HTLV-I ในชาวไทยภาคตะวันออกเฉียงเหนือ : การศึกษาเฝ้าระวัง 4 ปี

ยุพา เอื้อวิจิตรอรุณ, วท.ม.,,**, สหวัฒน์ บรัศว์รักษ์, วท.ม.*,**,*
จินตนา พัวไพโรจน์, พ.บ., อมรรัตน์ ร่มพฤกษ์, วท.ม.*,*
*ประวี คำภีระ, ป. พนักงานวิทยาศาสตร์การแพทย์ 2 ปี**

ได้ทำการศึกษาเพื่อเฝ้าระวังการติดเชื้อ HTLV-I ในชาวไทยภาคตะวันออกเฉียงเหนือด้วยการตรวจหา anti-HTLV-I เป็นเวลา 4 ปี (2535, 2536, 2538 และ 2540) ในตัวอย่างเลือดจากประชากรภาคตะวันออกเฉียงเหนือทั้งหมด 8,323 ราย ประกอบด้วย ผู้บริจาคโลหิต 6,228 ราย หญิงมีครรภ์ 823 ราย ผู้ป่วยรับเลือดบ่อย 219 ราย ผู้ติดยาเสพติดชนิดฉีดเข้าเส้นซึ่งติดเชื้อไวรัสเอดส์ 53 ราย และผู้เข้ารับการตรวจร่างกายไปทำงานต่างประเทศ 1,000 ราย

ผลการตรวจ anti-HTLV-I ด้วยวิธี particle agglutination (PA) พบว่ามีตัวอย่างเลือดจากผู้ป่วยรับเลือดบ่อยปี 2535 จำนวน 1 ราย และผู้บริจาคโลหิตปี 2538 อีก 1 ราย ให้ผลบวก anti-HTLV-I ด้วยวิธี PA แต่ให้ผลลบเมื่อตรวจยืนยันด้วยวิธี Western blot

ผลการศึกษานี้ชี้ให้เห็นว่า ในปัจจุบันเชื้อไวรัส HTLV-I ยังไม่เป็นปัญหาทางด้านสาธารณสุขของประเทศไทย โดยเฉพาะในภาคตะวันออกเฉียงเหนือ แต่อย่างไรก็ตามควรจะได้มีการศึกษาเพื่อเฝ้าระวังเป็นระยะ ๆ ต่อไป

* คลังเลือดกลาง, คณะแพทยศาสตร์ มหาวิทยาลัยขอนแก่น,
** ภาควิชาภูมิคุ้มกันวิทยาคลินิก, คณะเทคนิคการแพทย์, มหาวิทยาลัยขอนแก่น, จ.ขอนแก่น 40002