Toxoplasma gondii Antibody in HIV-Infected Persons

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Abstract

Toxoplasmosis in an immunocompromised host was not documented in Thailand until 1992 when HIV/AIDS infection became pandemic. Patients with toxoplasmic encephalitis and cerebral abscess were recorded, particularly from the northern part of the country. However, data on the prevalence of the disease in HIV/AIDS patients is not yet available. In this study the authors determine the prevalence of *T.gondii* antibody in HIV persons. During a two-year period 312 serum samples of which 190 were HIV positive and the remaining samples were negative for HIV were tested. In the HIV positive group, 44 samples (23.2%) were positive for toxoplasma IgG antibody, whilst in the HIV negative group 36 samples (29.5%) were positive. All antibody titres found were not higher than 1:64. There is no significant difference of toxoplasma IgG antibody in HIV positive and HIV negative persons (p=0.25). Among the HIV positive and *T.gondii* antibody positive group, 19 out of 44 persons (43.2%) had symptoms and signs of acute toxoplasmosis involving the eye and/ or the central nervous system. Due to the high reactivation rate, the authors propose that all HIV-infected persons should be tested for *T.gondii* antibody and prophylactic treatment of opportunistic infection from *T.gondii* should be considered in those with positive results.

Key word : HIV/AIDS, Toxoplasmosis, Prevalence

SUKTHANA Y, et al
J Med Assoc Thai 2000; 83: 681-684

Toxoplasmosis, a world-wide zoonotic infection caused by the protozoan parasite, *Toxoplasma gondii*, is transmitted to man by three major modes: ingesting food and water contaminated with oocysts from cat excreta, consuming raw or undercooked meat infected with pseudocysts and transplacental infection. In competent hosts, the disease is usually asymptomatic or there are insignificant

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non-specific symptoms whilst in immunocompromised hosts the previously quiescent infection is often reactivated with florid clinical symptoms and signs indicating involvement of various organs in particular the brain, lung and eye with serious and fatal consequences, if untreated. In Thailand, there are few reports of toxoplasmosis[1-4], most of which relate to the prevalence of toxoplasma antibody in pregnant women and blood donors. Before 1992, there was no case report of toxoplasmosis in an immunocompromised host in Thailand until HIV/AIDS became pandemic. Patients with toxoplasmic encephalitis and cerebral abscess as an opportunistic infection were recorded and the number seemed to be increasing each year, particularly in the northern part of country[5]. The emergence of toxoplasmosis in HIV persons is an urgent health problem requiring proper management, but data concerning the prevalence of infection, its pleomorphic clinical manifestations, results of treatment and prevention of the disease are not available. We, therefore, studied the prevalence of *T.gondii* antibody in HIV patients including those with clinically manifested toxoplasmosis.

SUBJECTS AND METHOD

Subjects

From July 1996 to June 1998, one hundred and ninety serum samples of HIV positive persons from several hospitals were tested for toxoplasma IgG antibody using the dye test method (Table 1). One hundred and twenty-two serum samples from HIV negative blood donors were enrolled as the HIV negative group. The demographic data and the clinical manifestations of individuals who provided the serum samples for study were recorded.

Dye test

Toxoplasma IgG antibodies were determined by the Sabin-Feldman dye test[6] which is still regarded as the mainstay of diagnosis of acquired infection. The aim of the test detects the toxoplasma IgG antibody in serial dilutions of patients' sera which reacts with life tachypzoites antigen from the peritoneal fluid of inoculated mouse and using methylene blue as the indicator staining.

Statistical analysis

We used descriptive statistics to determine the prevalence of *T.gondii* antibody and Chi-square test to compare the difference of *T.gondii* antibody between HIV positive and negative groups.

RESULTS

Out of 190 serum samples from HIV positive persons tested, 44 (23.2%) had *T.gondii* antibodies compared with 36 out of 122 (29.9%) from blood donors. There is no significant difference of toxoplasma IgG antibody in HIV positive and HIV negative persons (p=0.25) as shown in Table 2. All titres of *T.gondii* antibody were found to be not

Table 1. Background information of tested cases.

Variabe	Number of HIV infected cases n = 190	Number of HIV negative blood donor n = 122
Location		
Chonburi Regional Hospital	164	122
Pramongkutklao Hospital	10	-
Samuth Sakhon Hospital	14	-
Siriraj Hospital	2	-
Age		
<20	8	-
21-30	96	84
31-40	68	32
>40	18	6
Sex		
Male	152	67
Female	38	55

Table 2. Prevalence of *Toxoplasma gondii* antibody in HIV positive and negative persons.

HIV status Number of patients (%)	*T.gondii* antibody Positive (%)	p-value
positive 190 (60.9)	44 (23.2)	
negative 122 (39.1)	36 (29.9)	0.25

Table 3. Clinical features of central nervous system involvement among the HIV-infected and toxoplasma IgG antibody positive group (n= 6).

Central nervous system involvement	No.of patients	%
-severe headache	6	100
-impaired mental status	4	66.7
-generalized seizure	3	50
-focal lesions	3	50

Table 4. Clinical features of eye involvement among the HIV-infected and toxoplasma IgG antibody positive group (n= 13).

Eye involvement	No. of patients	%
retino-uveitis	8	61.5
chorioretinitis	4	30.8
papillitis	1	8.7

higher than 1:64. Among the HIV-infected and toxoplasma antibody positive persons, 19 out of 44 (43.2%) had eye and/or central nervous system symptoms and signs. Severe headache was the most common presenting symptom followed by clinical features of retino-uveitis, impaired mental status and other manifestations included generalized seizure and focal neurological deficits (Table 3 and 4). Computerization topography of the brain was performed on 3 out of 6 patients with neurological symptoms. Two patients showed a single mass lesion, while multiple mass lesions were found in the remaining patient.

DISCUSSION

The specific antibody response to *T.gondii* in immunocompromised individuals is still poorly understood. In those patients, visceral toxoplasmosis usually results from a reactivation of previously acquired infection[7]. Low titres of *T.gondii* antibody found in our study were consistent with chronic latent infection. Nineteen patients from the HIV positive and toxoplasma antibody positive group had features of acute toxoplasmiosis involving the brain and the eye indicating disease reactivation. However, 43.2 per cent of patients with reactivation is higher than those from previous reports[7-10]. Recently, potent anti-viral drugs against HIV infection have been advocated for improving the immune status of patients thereby decreasing the occurrence of opportunistic infection. Due to its high cost, such a regime is not feasible for all patients in developing countries. Therefore, prophylactic treatment of opportunistic infection from *T.gondii* with cheaper drugs such as cotrimoxazole seems more appropriate. Indeed, one study showed the rate of toxoplasmic encephalitis in patients receiving cotrimoxazole was 38 per cent compared with 72 per cent in those without prophylaxis[8].

With the high reactivation rate of toxoplasma infection from our study (43.2%), *T.gondii* antibody detection is recommended for all HIV/AIDS patients and if present, proper regimen for prophylaxis of reactivation from *T.gondii* should be strongly considered. Moreover, in those cases with toxoplasma reactivation long term prophylaxis with cotrimoxazole should be given after treatment with anti-toxoplasmic drugs since such drugs are only effective on tachypzoites, but cannot eradicate bradyzoites in tissue cyst.

ACKNOWLEDGEMENT

The authors wish to thank the staff of Chon Buri Regional Hospital, Pramongkutklao Hospital, Samuth Sakhon Hospital and Faculty of Medicine, Siriraj Hospital, for providing serum samples and clinical data of patients. This study was partly supported by the Faculty Research Fund.

(Received for publication on October 21, 1999)

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แอนติบอดีต่อเชื้อโรคขี้แมว (*T. gondii*) ในผู้ป่วยติดเชื้อเอ็ชไอวี

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โรคขี้แมว (Toxoplasmosis) เป็นโรคติดเชื้อฉวยโอกาสในผู้ป่วยติดเชื้อเอ็ชไอวี ซึ่งเป็นปัญหาสาธารณสุขสำคัญที่กำลังเพิ่มมากขึ้นเรื่อย ๆ ของประเทศไทยโรคหนึ่ง แต่ข้อมูลทางระบาดวิทยา ความชุกภูมิคุ้มกันต่อเชื้อ *Toxoplasma gondii* อาการและอาการแสดงของโรคนี้ยังมีไม่มาก เป็นผลให้การวางแผนการระบาดของโรค การวินิจฉัยการให้การรักษาและป้องกันโรคนี้ทำได้ไม่ดีเท่าที่ควร ดังนั้นคณะผู้วิจัยจึงได้ศึกษาถึงความชุกภูมิคุ้มกันต่อเชื้อ *T. gondii* ในกลุ่มผู้ป่วยติดเชื้อเอ็ชไอวีจำนวน 190 ราย โดยวิธี Sabin-Feldman Dye Test และศึกษาถึงอาการ อาการแสดง ของผู้ป่วยที่ได้ทำการตรวจน้ำเหลืองดังกล่าว และนอกจากนี้ยังได้ทำการตรวจหาภูมิคุ้มกัน *T. gondii* ในกลุ่มผู้บริจาคโลหิตอีก 122 รายเพื่อใช้เปรียบเทียบเป็นกลุ่มไม่ติดเชื้อเอ็ชไอวี พบว่าร้อยละ 23.2 ของกลุ่มติดเชื้อเอ็ชไอวีมีความชุกภูมิคุ้มกันต่อเชื้อ *T. gondii* ในขณะที่กลุ่มผู้บริจาคโลหิตร้อยละ 29.5 มีภูมิต่อเชื้อดังกล่าว แต่ทั้งนี้ไม่มีความแตกต่างกันทางสถิติ ($p = 0.25$)

19 ใน 44 คน (43.2%) ที่ติดเชื้อเอ็ชไอวี และมีภูมิต้านทานต่อเชื้อ *T. gondii* มีอาการและอาการแสดงทางระบบประสาทส่วนกลางและตา จึงถือว่าเป็นกลุ่มที่กลับเป็นโรคขี้แมว (reactivation) โดยพบว่าการปวดหัวอย่างรุนแรงเป็นอาการที่นำผู้ป่วยมาพบแพทย์มากที่สุด

เนื่องจากการกลับเป็นโรคค่อนข้างสูงคณะผู้วิจัยจึงเสนอให้แพทย์ที่ดูแลผู้ป่วยติดเชื้อเอ็ชไอวีควรส่งตรวจหาภูมิคุ้มกันต่อเชื้อ *T. gondii* และควรพิจารณาให้ยาป้องกันการกลับเป็นโรคถ้าผู้ป่วยเหล่านั้นมีภูมิคุ้มกันต่อเชื้อดังกล่าว

คำสำคัญ : ผู้ป่วยเอ็ชไอวี, โรคขี้แมว (Toxoplasmosis), ความชุก

เยาวลักษณ์ สุขธนะ และคณะ
จดหมายเหตุทางแพทย์ ฯ 2543; 83: 681-684

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