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Seroprevalence of Toxoplasmosis among AIDS Patients in Hospital Kuala Lumpur, 2001

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ABSTRACT

Four hundred and six AIDS patients were recruited in this retrospective study. The seroprevalence of toxoplasmosis among 406 AIDS patients was 208 (51.2%). Their age ranged from 17 to 74 years with a median of 35 years. The majority of patients were males 172 (82.6%), Malays 99 (47.5%), single 109 (52.4%), unemployed 99 (47.6%) and heterosexual with commercial sex workers (CSW) 97 (46.6%) as the risk marker to HIV infection. Thirty-one (14.9%) of 208 AIDS-related toxoplasmosis were diagnosed as active toxoplasmic encephalitis. The most common clinical manifestation was headache (67.7%). The CT scan findings showed most lesions to be multiple (87.5%), hypodense (66.7%), and in frontal region (41.7%). Twenty-two (71%) patients had chronic (latent) *Toxoplasma* infection as evidenced by seropositivity for anti-*Toxoplasma* (IgG) antibody. They were statistically significant in the association between CD4 count and toxoplasmic encephalitis (P=0.019; OR=2.6; 95%CI=1.14-6.02). After the initial six weeks of anti-TE therapy, relapsing toxoplasmic encephalitis was detected in 9.7% in this study.

Keywords: AIDS, Toxoplasmosis, Toxoplasmic encephalitis (TE)

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INTRODUCTION

Toxoplasmosis is caused by an ubiquitous, intracellular parasite *Toxoplasma gondii*, and cosmopolitan zoonosis. It is a frequent cause of subclinical latent human infection and reactivation of the chronic infection in the central nervous system with resultant toxoplasmosis occurring almost exclusively in HIV/AIDS-related complication in these patients[1]. Brain toxoplasmosis is one of the more frequent opportunistic infections and the most common cause of brain focal lesions complicating the course of AIDS[2,3]. Toxoplasmic encephalitis (TE) is the most common clinical disease entity due to toxoplasmosis observed in AIDS patients[4], a life-threatening condition and early diagnosis is highly desirable for initiation of specific therapy and to avoid misdiagnosis, especially with primary cerebral lymphoma[5]. However, no study on the seroprevalence of toxoplasmosis has been done among AIDS patients in Malaysia. We, therefore, would like to conduct this study to determine the seroprevalence of toxoplasmosis among AIDS patients in the Hospital Kuala Lumpur (HKL), in order to get some baseline information, from which clinical implications may be drawn. Further studies may be indicated or further guidelines of HIV/AIDS patients care could be recommended.

MATERIALS AND METHODS

This retrospective study was carried out in the Out-Patients Department (OPD) for infectious diseases in the Hospital Kuala Lumpur (HKL) in May 2001. Four hundred and six eligible patients aged more than 14 years with anti-HIV antibodies positive by any serological tests (ELISA (I, II), CLIA, or LA) and confirmed by means of Western blot assay were recruited from January 1994 to March 2001 in this study. All patients' data (demographic characteristics, risk factors related to HIV infection, clinical manifestations, investigations and outcome relating to toxoplasmosis) were recorded in the standardised data collection sheet. In these files, the AIDS diagnosis was based on the 1993 CDC criteria, and TE was diagnosed in the presence of at least two of the following findings: a history of neurological symptoms; neurological signs at admission, or suggestive computed tomography (CT), all associated with the introduction of anti-TE (fansidar+clindamycin/dapsone) therapy. Using the same form, we also analysed files from AIDS patients with other CNS infections such as cryptococcosis, primary CNS lymphoma and tuberculosis, for correction of finally undefined bias. A good therapeutic response was defined as improvement of clinical condition, regression of neurological signs and symptoms, or improvement of CT scan.

Table I. Demographic and baseline characteristics of the study subjects.

Characteristics	No. of patients (n = 208)	Percentage
Range of age = 17-74 years		
Median = 35 years		
Sex		
Male	172	82.6%
Female	36	17.4%
Race		
Malay	99	47.5%
Chinese	72	34.6%
Indian	34	16.3%
Foreigner	3	1.4%
Marital status		
Single	109	52.4%
Married	99	47.6%
Occupation		
Labourer	50	24.0%
Nonlabourer	59	28.4%
Unemployed	99	47.6%
Risk behaviours		
Heterosexual with CSW*	97	46.6%
Injecting drug users (IDU)	55	26.4%
Homosexual	1	0.5%
Blood transfusion (BT)	2	1.0%
Combined risk behaviours	53	25.5%

* commercial sex workers

Table II. Age distribution of the study subjects.

Age group	No. of patients	Percentage
The sex ratio M:F = 4.9:1		
Male		
15-24	9	4.3%
25-34	63	30.1%
35-44	70	33.7%
45-54	22	10.6%
≥ 55	9	4.3%
Female		
15-24	7	3.4%
25-34	19	9.1%
≥ 35	9	4.4%

Table III. Clinical manifestations of TE patients in this study.

Clinical manifestations	No. of patients	Percentage
Headache	21	67.7%
Fever	16	51.6%
Seizure	2	6.5%
Hemiparesis	4	12.9%
Hemiplegia	2	6.5%
Aphasia	1	3.2%
Loss of conciousness	1	3.2%

Toxoplasmosis was screened by standard ELISA commercial kit (AxSYM, USA) in accordance with the manufacturer's instruction. The titre of anti-*Toxoplasma* (IgG) antibody ≥3 IU/ml was considered positive in this study.

STATISTICAL ANALYSIS

The results were analysed by using the statistical software SPSS. The data with quantitative variable were indicated as mean and range, qualitative variable were indicated as frequency and percentage. The association between CD4 count and toxoplasmic encephalitis was analysed by using Pearson, Chi-square, Odds Ratio and 95% Confidence Interval.

RESULTS

Tables I and II summarise the patients' baseline demographic characteristics at the time of this study. The age range was 17 to 74 years with a median of 35 years. The predominant age group for males was 35 to 44 years of age but younger (25 to 35 years) for females. The various ethnic groups were Malays 99 (47.5%), Chinese 72 (34.6%), Indians 34 (16.3%), and Foreigners 3 (1.4%). The majority of patients were single 109 (52.4%), unemployed 99 (47.6%), and heterosexual with CSW (Commercial Sex Workers) 109 (46.6%) as the risk behaviour to HIV infection.

We found that the most common clinical manifestations of TE patients were headache (67.7%), and chronic (latent) *Toxoplasma* infection (71.0%) as evidenced by seropositivity for anti-*Toxoplasma* (IgG) antibody. CT scan findings showed most lesions to be multiple ring enhancement (87.5%) with hypodense (66.7%) and in frontal region (41.7%) as shown in Tables III, IV and V respectively.

DISCUSSION

The seroprevalence of toxoplasmosis in this study was 51.2%. It is not surprising since this organism poses many diagnostic and therapeutic challenges for clinicians treating human immunodeficiency virus (HIV) infected patients[6]. However this seroprevalence was much higher than other studies e.g. 15-37% in France[7], 21% in Malaysia[8], 22.4% in Thailand[9] and 10-40% in USA[10]. The differences could be due to the sample size, geographical distribution, diagnostic methods, or possible risk factors contributing to acquisition of the infection.

It is interesting to document that 14.9% of these patients developed active toxoplasmic encephalitis (TE). Most cases of clinical toxoplasmosis in AIDS result from reactivation of a chronic infection[11]. One study noted that 5-10% of AIDS patients in USA and 15% of AIDS patients in Western Europe

Table IV. Serologic evidence of chronic (latent) *Toxoplasma* infection in TE patients.

Anti-*Toxoplasma* (lgG) antibody	No. of patients	Percentage
Positive	22	71%
Not available	9	29%

Table V. CT scan finding from TE patients in this study.

CT scan findings	No. of patients	Percentage
Location		
Frontal	10	41.7%
Midbrain	5	20.8%
Parietal	8	33.3%
Parietotemporal	4	16.7%
Thalamus	2	8.3%
Occipital	1	4.2%
Internal capsule	1	4.2%
Cerebellum	1	4.2%
Right hemisphere	1	4.2%
Enhancement		
One	3	12.5%
Multiple	21	87.5%
Density		
Hypodensity	16	66.7%
Other		
Oedema	6	25.0%

will develop cerebral toxoplasmosis[12]. The risk of an AIDS patient with positive for latent *Toxoplasma* infection developing the central nervous system infection has been estimated up to 30%[11].

In this study, we found that there was association between the level of CD4 cell count and toxoplasmic encephalitis (P=0.019) (OR=2.6; 95% CI=1.14-6.02). This could be explained that the majority of patients 23 (74.1%) who had CD4 count <200 cell/cumm would have a higher chance to develop toxoplasmic encephalitis than others who had CD4 count >200 cell/cumm. Therefore, it is still recommended to monitor CD4 count as one of the prognostic markers for AIDS patients before they will develop more complicated and life-threatening conditions.

It is observed that 9.7% of these patients had a relapse of toxoplasmic encephalitis during the period of this study. Central nervous system toxoplasmosis is a major parasitic infection in patients with AIDS. Life-long pyrimethamine plus sulfadiazine is the treatment of choice[10] but this therapy has had to be discontinued because of adverse reactions in up to 40% of patients[13], which lead to poor or non compliance to anti-*Toxoplasma* therapy. This could be explained that treatment as a rule does not eradicate infection since most drugs for treating toxoplasmosis are active only against the tachyzoite form of the parasite, with the exception of atovaquone, which has activity in vitro against tissue cyst as well[14,15]. Atovaquone appears to be an effective therapeutic agent in this situation, and is generally well tolerated[16].

In conclusion, toxoplasmosis is still a major problem worldwide particularly in HIV/AIDS patients. This study was conducted to present an overview of toxoplasmosis as well as its complication. With the increasing access to the effective antiretroviral therapy, it is hoped that toxoplasmic encephalitis prevalence will decrease in the years ahead.

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