J Microbiol Immunol Infect.
2009;42:500-504

Original Article

Characteristics of amebic liver abscess in patients with or without human immunodeficiency virus

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Received: June 24, 2008 Revised: July 20, 2008 Accepted: August 30, 2008

Background and purpose: Amebic liver abscess (ALA) is the most common extra-intestinal amebiasis. This study was performed to review the clinical features of patients with amebic liver abscesses and compare them in Taiwanese patients with or without human immunodeficiency virus (HIV).

Methods: The medical charts of 27 inpatients with ALA treated at the Taipei Medical University Hospital, Taipei, Taiwan, were retrospectively analyzed. ALA was defined as positive findings of indirect hemagglutination test (IHA) and imaging study. Patients were divided into 2 groups according to their HIV infection status.

Results: The most common clinical symptoms were fever (89.9%) and abdominal pain (81%). The mean white blood cell count in HIV-uninfected patients was significantly higher than in infected patients (17,830 ± 4,722/μL vs 11,549 ± 5,325/μL; $p < 0.01$). The aspartate aminotransferase levels were significantly lower in HIV-infected patients than in uninfected patients (85.7 ± 59.1 IU/L vs 31.7 ± 21.2 IU/L; $p < 0.01$). Three HIV-uninfected patients and 10 infected patients had IHA titer >1:1024 ($p < 0.05$). The duration of hospital stay was longer for HIV-uninfected patients than for infected patients (24.8 ± 14.6 days vs 11.6 ± 5.9 days; $p < 0.05$)

Conclusions: HIV-infected patients with ALA had a more insidious onset of illness, significantly lower white cell count and liver enzymes, and shorter duration of hospital stay than uninfected patients. Physicians should be alert to ALA for early diagnosis and treatment.

Key words: Entamoeba histolytica; HIV; Liver abscess, amebic

Introduction

Amebiasis is an infection caused by the parasite *Entamoeba histolytica*, which is common throughout the world, especially in tropical areas [1]. Most patients infected with *E. histolytica* have colonic symptoms and signs. The exact incidence of the infection has not been elucidated, but about 40,000 to 100,000 people die annually due to amebiasis [2].

The most frequent form of extraintestinal amebiasis is amebic liver abscess (ALA). ALA develops in less than 1% of patients infected with *E. histolytica*, but this still represents a large number of patients [3]. With the availability of potent antiamebic drugs, ALA has a relatively benign course with a low mortality rate. However, despite advances in diagnosis and therapeutic strategies, mortality from ALA ranges from 1.7% to 17.7% [4-8].

According to the literature, ALA risk factors include heavy alcohol consumption (>150 g/d) and recent travel to an area endemic for amebiasis [4]. Impaired immunity plays an important role. In a study by Seeto and Rockey, almost one-third of patients with ALA did not have a history of travel, and 63% had severe immunosuppression [6]. Human immunodeficiency virus (HIV) infection was the most common condition (10.7% of patients).

In Taiwan, the characteristics of ALA in HIV-infected patients are not clear. This retrospective

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analysis of patients with ALA was performed to elucidate the clinical characteristics and compare them between patients with or without HIV infection in Taiwan.

Methods

Patients

The medical records of inpatients with ALA treated at Taipei Municipal Jen-Ai Hospital and Taipei Medical University Hospital, Taipei, Taiwan, from January 1, 1985 to July 31, 2007 were retrospectively reviewed. Clinical data of ALA symptoms, days before admission, duration of hospital stay, hematologic and liver function profiles, and computed tomography (CT) or ultrasonography (US) findings were recorded. For comparison, patients were divided into 2 groups according to their HIV infection status.

Case definitions

ALA was diagnosed by positive indirect hemagglutination (IHA) serologic titer (>1:256 x) or with 4-fold change (Dade Behring Inc., Newark, NJ, USA); liver abscess identified by CT or US; and no bacteria or fungi isolated from aspirated fluid [8-10]. HIV was diagnosed by positive HIV serum test by Western blot assay and detectable viral load.

Statistical analysis

Significant differences of continuous variables, reported as mean ± standard deviation (SD), were determined by Student's *t* test, and categorical variables by chi-squared test. All statistical analyses were done using the Statistical Package for the Social Sciences version 12.0 (SPSS, Inc., Chicago, IL, USA). The differences were considered significant if p values were <0.05.

Results

There were 14 HIV-uninfected patients and 13 infected patients. Eleven patients without HIV infection were men, and all 13 infected patients were men. The mean age at presentation was 41.2 years (range, 24 to 65 years) [Table 1]. Among the 14 HIV-uninfected patients, 6 had a recent (within 2 months) history of travel to the amebiasis endemic areas of Southeast

Table 1. Clinical characteristics of patients with amebic liver abscess with or without human immunodeficiency virus infection.

Characteristic	Human immunodeficiency virus–negative (n = 14) No. (%)	Human immunodeficiency virus–positive (n = 13) No. (%)	*p*
Mean age (years) [mean ± SD]	43.9 ± 11.8	38 ± 11.2	0.2037
Male:female	11:3	13:0	0.2222
Indirect hemagglutination titer >1024 x	3 (21.4)	10 (76.9)	0.0040[b]
Duration of hospital stay (days) [mean ± SD]	24.8 ± 14.6	11.6 ± 5.9	0.0063[b]
Duration before admission (days) [mean ± SD]	10.9 ± 9.5	12.7 ± 12.5	0.6688
Size of abscess (cm) [mean ± SD]	8.3 ± 3.7	5.8 ± 3.3	0.0763
Abscess			1.0000
Single	10 (71.4)	10 (76.9)	
Multiple	4 (28.6)	3 (23.1)	
Abscess location			0.1696
Left lobe	5 (35.7)	2 (15.4)	
Right lobe	9 (64.3)	11 (84.6)	
Chest radiograph findings			0.5680
None specific	8 (57.1)	6 (46.2)	
Abnormal[a]	6 (42.9)	7 (53.8)	
Percutaneous fine-needle aspiration	12 (85.7)	6 (46.2)	0.0460[c]
Treatment			0.3467
Metronidazole only	11 (78.6)	13 (100)	
Surgical drainage	2 (14.3)	0 (0)	
Aspiration	1 (7.1)	0 (0)	

[a]Abnormal chest radiograph finding included right hemidiaphram elevation and right or bilateral costophrenic angle blunting.
[b]$p < 0.01$.
[c]$p < 0.05$.

Table 2. Laboratory data of 27 patients with amebic liver abscess with or without human immunodeficiency virus infection.

	Human immunodeficiency virus–negative (n = 14) Mean ± SD	Human immunodeficiency virus–positive (n = 13) Mean ± SD	*p*
White blood cells (/μL)	17,830 ± 4722.4	11,549 ± 5324.9	0.0033[a]
Hemoglobin (g/dL)	11.4 ± 2.1	11.9 ± 1.6	0.4448
Platelet (/μL)	319,920 ± 166,650	235,000 ± 85,473	0.1328
Alanine aminotransferase (IU/L)	72.9 ± 44.2	30.8 ± 14.9	0.0039[a]
Aspartate aminotransferase (IU/L)	85.7 ± 59.1	31.7 ± 21.2	0.0053[a]
Direct bilirubin (mg/dL)	0.43 ± 0.28	0.52 ± 0.48	0.6020
Total bilirubin (mg/dL)	1.01 ± 0.56	1.12 ± 0.89	0.7349
Alkaline phosphatase (IU/L)	334.5 ± 143.3	290.2 ± 230.7	0.6076
r-Glutamyl transpeptidase (IU/L)	117.7 ± 69.9	170.3 ± 152.3	0.3814
Cholesterol (mg/dL)	106.6 ± 37.0	112.7 ± 83.2	0.8589
C-reactive protein (mg/dL)	183.8 ± 48.9	155.6 ± 65.8	0.5172
Lactate dehydrogenase (IU/L)	568.0 ± 148.7	599.5 ± 191.7	0.8238

[a] $p < 0.01$.

Asia (n = 4) and China (n = 2). Two patients had schizophrenia and were institutionalized; 1 also had diabetes mellitus and the other was an alcoholic. ALA was the initial presentation of HIV infection for 7 of the 13 infected patients.

The most common clinical symptoms at presentation were fever (n = 24; 89.9%) and abdominal pain (n = 22; 81%). Other symptoms included diarrhea (bloody or watery; n = 4), jaundice (n = 3), and weight loss (n = 2). Microscopic examinations for amoeba in stool specimens were all negative. The average duration of symptoms was 11.7 days (range, 2 to 45 days).

Table 2 shows the laboratory data for the HIV-infected and -uninfected patients. Most patients had leukocytosis (n = 22; 81.5%), defined as white blood cell (WBC) count >10,000/μL. All patients without HIV infection had leukocytosis, but 5 patients with HIV infection had normal WBC count ($p < 0.05$). The mean white blood cell count in HIV-uninfected patients was significantly higher than in infected patients ($p < 0.01$). The aspartate aminotransferase (AST) levels were significantly lower in HIV-infected patients than in uninfected patients ($p < 0.01$), as were the alanine aminotransferase (ALT) levels ($p < 0.01$). Three HIV-uninfected patients and 10 infected patients had IHA titer >1:1024 ($p < 0.05$). The duration of hospital stay was longer for HIV-uninfected patients than for infected patients ($p < 0.05$)

All patients received metronidazole treatment after ALA was diagnosed. There was no difference in days to clinical improvement after treatment between the 2 groups of patients. One HIV-uninfected patient died within 5 days due to a large abscess with rupture and septic shock.

Among 18 patients receiving percutaneous fine-needle aspiration (PFNA) for diagnosis or treatment, there were no complications. There were no significant differences in size, number, or location of the abscesses between HIV-uninfected and -infected patients. PFNA was required significantly less often for HIV-infected patients ($p = 0.046$).

Discussion

Amebiasis commonly occurs in tropical areas with crowded living conditions and poor sanitation [1]. Due to improvements in sanitation, public health, and personal hygiene, the prevalence of amebiasis is low in Taiwan. Risk factors for ALA include high alcohol consumption, recent travel to an endemic area [4], or impaired immunity. HIV infection has become an important risk factor for invasive amebiasis, including ALA [11,12].

A male preponderance for ALA has been reported as a ratio of 10:1 [6,7,13]. Hsu et al studied 33 Taiwanese patients with ALA and found that all 28 patients with HIV infection were men [14]. In this study, the male-to-female ratio was 8:1 (24:3); all the patients with HIV were men, and the 3 women did not have HIV infection. Homosexual behavior may play a role in this phenomenon. Recent Asian studies have shown that invasive amebic diseases occur more often in homosexual men, especially in those homosexual individuals coinfected with HIV [11,15-17]. Oral-anal

contact renders patients more likely to be infected by amebas [11]. ALA was the initial presentation for more than half of the HIV-infected patients in this study. Based on these findings, patients diagnosed with ALA should be checked for HIV status.

For HIV-uninfected patients, several theories have been postulated for the sex difference: heavy alcohol consumption among men [6], hormonal effects that may modulate infection among premenopausal women [18], and a possible protective effect of iron-deficiency anemia among menstruating women [5].

Fever and abdominal pain were the 2 commonest symptoms in this study. The frequency of occurrence was similar to previous reports, which develop in more than 85% of patients with ALA [19]. There was no obvious difference in clinical symptoms between HIV-uninfected and -infected patients. However, HIV-infected patients had significantly lower white blood cell counts and hepatic aminotransferase levels than uninfected patients. This phenomenon could be explained by a reduced systemic inflammatory response related to HIV infection. However, HIV-infected patients were likely to have a higher IHA titer in this study. This finding might be attributed to the long duration before presentation to the hospital.

Percutaneous FNA of ALA is a safe procedure that can differentiate pyogenic liver abscesses, and reduce the abscess size, thus relieving symptoms. There were no complications among the 18 patients receiving FNA for diagnosis or treatment in this study. Although there were no significant differences in size, number, or location of the abscesses between HIV-uninfected and -infected patients, PFNA was required significantly less often for HIV-infected patients (p = 0.046). One reason could be physicians' reluctance to perform invasive procedures for HIV-infected patients. Additionally, physicians might not be as aware of ALA in HIV-uninfected patients as in HIV-infected patients.

Despite the insidious onset of ALA and longer duration of symptoms before hospital admission, the duration of hospital stay was shorter for HIV-infected patients than for uninfected patients. There was no difference in days to clinical improvement after treatment between the 2 groups in this study. Diagnosis of ALA might be earlier in HIV-infected patients, resulting in shorter duration of hospital stay. ALA usually has a benign prognosis. In this study, 1 patient died within 5 days of admission due to a ruptured large abscess and septic shock. The overall mortality rate was 3.7%, which is similar to other reports [8].

In this comparison of the clinical features of ALA between HIV-uninfected and -infected patients, HIV-infected patients were found to have a more insidious onset of illness and milder symptoms. No obvious differences were found in clinical symptoms, abscess number, and abscess size and location, but significantly lower WBC count, AST and ALT levels were found in patients coinfected with HIV. The IHA titer was higher in HIV-infected patients. The duration of hospital stay was significantly longer for HIV-uninfected patients than for HIV-infected patients. Physicians should be alert to the possibility of ALA infection for early diagnosis and treatment.

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