SOCIOECONOMIC STATUS, CLINICAL FEATURES, LABORATORY AND PARASITOLOGICAL FINDINGS OF HEPATIC AMEBIASIS PATIENTS - A HOSPITAL BASED PROSPECTIVE STUDY IN BANGLADESH

SM Shamsuzzaman[1,2], Rashidul Haque[3], SK Ruhul Hasin[4], William A Petri Jr[5] and Yoshihisa Hashiguchi[2]

[1]Department of Microbiology, Dhaka Medical College, Dhaka, Bangladesh; [2]Department of Parasitology, Kochi Medical School, Nankoku, Kochi, Japan; [3]Parasitology Laboratory, International Center for Diarrheal Disease and Research, Dhaka, Bangladesh; [4]Department of Microbiology, Institute of Post Graduate Medicine and Research, Dhaka, Bangladesh; [5]Department of Internal Medicine, Room 2115 MR4 Building, University of Virginia School of Medicine, Charlottesville, VA 22908, USA

Abstract. Socioeconomic status, clinical, laboratory and parasitological features of 31 hospitalized amebic liver abscess (ALA) and 8 amebic hepatitis (AH) patients were studied. Thirty-seven (94.9%) of the total 39 cases were from low socioeconomic class and 2 (5.1%) were from middle class ($p<0.001$). Sixteen (51.6%) ALA and 5 (62.5%) AH patients were admitted with duration of disease for 3 weeks or more. Twenty-one (67.7%) ALA and 3 (37.5%) AH cases gave no previous history of diarrhea or dysentery. Epigastric pain was the predominant symptoms in 71% patients compared to high fever (19.4%), nausea and vomiting (9.7%). Neutrophilic leukocytosis was found in 9 (29.0%) ALA and 2 (25%) AH cases. Raised alkaline phosphatase was the predominant abnormal liver function test found elevated in 22 (71.0%) ALA and 5 (62.5%) AH cases. Three (7.7%) of the 5 (12.8%) microscopy positive stool samples yielded growth of *Entamoeba histolytica* in culture. The right lobe was involved in 28 (90.3%) ALA cases; 29 (93.5%) patients had single abscess. Bacterial super infection was observed in 1(12.5%) abscess, reactive changes in right lung was observed in 6 (19.4%) ALA and 1 (12.5%) AH cases. *Ascaris lumbricoides* was the predominant associated intestinal parasite.

INTRODUCTION

The protozoan parasite *Entamoeba histolytica* infects approximately 500 million people in developing countries such as Bangladesh, India, Mexico, Colombia and other nations of Central and South America, Tropical Asia and Africa (Reed, 1998), resulting in approximately 40 million cases of amebic dysentery; about 40% of the symptomatic subjects progress to liver abscess, leading to 40,000 to 110,000 deaths per year (Walsh, 1986; WHO, 1997). In Bangladesh the prevalence of intestinal amebiasis varies from 2.5% to 12.2% in different studies (Muttalib *et al*, 1975; Wanke *et al*, 1988). Extraintestinal involvement is a dreaded complication of amebiasis associated with increased mortality. Amebic liver abscess is the most serious sequelae and if left untreated is usually fatal. Despite advances in diagnosis and therapeutic strategies, mortality varies from 2.0 - 18.5% in different series (Crane *et al*, 1972; Isai, 1973; Shabot and Patterson, 1978; Sharma *et al*, 1996). But little work has been carried out on hepatic amebiasis in Bangladesh. Hepatic amebiasis is diagnosed in Bangladesh by history, clinical features and laboratory findings. Several serological tests are used in different countries (Petri *et al*, 1987; Ravdin *et al*, 1990; Baveja *et al*, 1992) but are not usually available in Bangladesh. Due to environmental (such as arsenic and lead poisoning), nutritional and immunological (AIDS) factors the clinical course and pattern of different diseases are changing. In the present study, we explored socioeconomic status, clinical, laboratory and parasitological features of clinically diagnosed amebic liver abscess (ALA) and amebic hepatitis (AH) patients admitted in different government hospitals of Dhaka, Bangladesh.

Correspondence: Dr SM Shamsuzzaman, Department of Parasitology, Kochi Medical School, Nankoku City, Kochi-783-8505, Japan.
Tel/Fax: +81-888-80-2415, Email: shamsuzz@kochi-ms.ac.jp

MATERIALS AND METHODS

Patients

A prospective study was carried out on 39 clinically diagnosed hepatic amebiasis (HA) pa-

tients of different age and sex; 31 of them were amebic liver abscess (ALA) and 8 were amebic hepatitis (AH). Patients admitted in Dhaka Medical College Hospital, Sir Salimullah Medical College Mitford Hospital, and the Institute of Post Graduate Medicine and Research, Dhaka, Bangladesh from September, 1993 to June, 1994. HA was clinically diagnosed after excluding the endemic causes of hepatomegaly (such as malaria, kala-azar, typhoid fever, viral hepatitis etc) by the following criteria (1) Pain in right hypochondrium, tip of the right shoulder or back with or without fever, (2) Enlarged (*ie* palpable liver at least 2 cm below the right costal margin at mid clavicular line with the upper border of liver dullness not below 5th intercostal space) and tender liver usually without jaundice, (3) Raised right dome of diaphragm in chest X-ray, (4) Absence of markers for common hepatitis viruses (A-E) and liver function tests suggestive of HA (liver function tests especially ALT and serum bilirubin usually normal in HA, if raised it is marginal) and (5) All were improved after treatment with anti-amebic drugs (metronidazole 800 mg every 8 hours for 10 days followed by furamide 500 mg every 8 hours for 10 days). In addition to the above criteria, patients who had enlarged liver with abscess on ultrasonography were diagnosed as ALA and those who had no abscess diagnosed as AH (Chatterjee,1984). On subsequent examination of these 39 patients positive serology for *E. histolytica* antibody or antigen was found (data not shown).

Detailed history regarding the presenting disease, history of diarrhea or dysentery , age, sex and occupation were recorded in a predesigned history sheet. Socioeconomic status was ascertained by monthly income. Patients who had monthly income less than 3,000 taka were considered as the low income group. Monthly income between 3,001-20,000 taka were the middle income group and monthly income above 20,000 taka were considered as the high income group (Islam, 1992). This study was approved by the local ethical review committee and informed written consent was obtained from each patient or the guardian.

Sample collection

A single stool sample was collected from each patient. Five ml venous blood was collected from each patient. Sera were separated and stored at -20℃ until use. Pus was collected from 8 ALA cases in aseptic condition through right 8th intercostal space or through right subcostal region using lumber puncture needle or a 50 ml syringe with a wide bore needle. Last few drops of pus was inoculated into Robinson's media directly from the aspirating needle for culture of *E. histolytica* (Robinson, 1968).

Laboratory methods

Stool samples were examined for color, consistency, visible blood or mucus. Saline and iodine preparations of stool samples were examined under microscope for cysts or trophozoite of *E. histolytica* and cysts, trophozoites or ova of other intestinal parasites. Stool samples were also cultured in Robinson's media for *E. histolytica* . Pus samples were examined under microscope for trophozoite of *E. histolytica* and kept at -20℃ for future use. All the 8 pus samples were inoculated into blood agar, chocolate agar and MacConkey's agar media for isolation of bacteria. Total and differential count of WBC, hemoglobin level and liver function tests such as serum bilirubin, serum alkaline phosphatase level, alanine aminotranferase (ALT) and prothrombin time were done.

Data analysis

Data were analyzed and proportions were compared using Student's *t*-test. Significant difference was considered when $p<0.05$.

RESULTS

Table 1 shows the age and sex distribution of the study population. Twenty-four (77.4%) of the ALA patients belonged to 21-50 years of age and only one patient was below 20 years of age (range 15-75 years, mean age 39.5 years, median 38 years). Twenty-six of the ALA patients were male ($p<0.01$) with a male female ratio 5.2:1. Most (93.5%) of the ALA and all AH patients were from low income group and the remaining 6.5% ALA patients were from middle income group ($p<0.001$). Pain was the predominant symptoms in 71% ALA cases when compared to high fever (19.4%), nausea and vomiting (9.7%) (Table 2). Duration of the disease during hospitalization was 2 weeks in 2 patients, 3 weeks in 16 patients, 4 weeks in 8 patients, 5 weeks or more in 5 ALA patients. Of 8 AH patients 2 (25%) were admitted for 2 weeks, 5 (62.5%) with 3 weeks and 1 (12.5%) for 4 weeks duration of disease. Sixty-eight percent of the ALA and 37.5% of AH patients gave no history of intestinal amebiasis during the last 6 months prior to hospital-

Table 1
Age and sex distribution of amebic liver abscess ALA) and amebic hepatitis (AH) patients.

	ALA (n=31)			AH (n=8)		
Age in year	Male	Female	Total (%)	Male	Female	Total (%)
10-20	1	0	1(3.2)	0	1	1(12.5)
21-30	6	3	9(29.0)	2	1	3(37.5)
31-40	6	0	6(19.4)	1	1	2(25.0)
41-50	8	1	9(29.0)	1	0	1(12.5)
51-60	3	1	4(12.9)	0	1	1(12.5)
61-75	2	0	2(6.5)	0	0	0(0)
Total	26	5	31(100)	4	4	8(100)

Table 2
Clinical presentation of hepatic amebiasis patients at the time of hospitalization.

	No. (%) of patients	
Symptoms	ALA (n=31)	AH (n=8)
Predominant pain in hypochondrium or lower chest	22(71.0)	5(62.5)
Pain with high fever	6(19.4)	2(25.0)
Pain with predominant nausea and/or vomiting	3(9.7	1(12.5)

Table 3
History of intestinal amebiasis during or in the past 6 months of hospitalization.

	No.(%) of patients	
History of intestinal amebiasis	ALA (n=8)	AH (n=31)
During diagnosis	1(3.2)	0(0)
Before 2 months	4(12.9)	4(50.0)
Before 3-6 months	5(16.1)	1(12.5)
No history of amebiasis in previous 6 months	21(67.7)	3(37.5)

Table 4
Involvement of different lobes of liver in amebic liver abscess patients.

	No.(%) of patients		
Lobes involved	Single	Multiple	Total
Right lobe (n=28)			
anteriorly located	22(71.0)	1(3.2)	23(82.1)
posteriorly located	5(16.1)	0(0)	5(17.9)
Left lobe (n=2)			
anteriorly located	2(6.5)	0(0)	2(100)
Both right and left lobe (n=1)			
anteriorly	0(0)	1(3.2)	1(100)
Total	29(93.6)	2(6.4)	31(100)

Table 5
Results of microscopic examination of stool samples showing intestinal parasites.

Parasites	No.(%)
Ascaris lumbricoides	11 (28.2)
Entamoeba histolytica	5 (11.8)
Giardia lamblia	3 (7.7)
Entamoeba coli	2 (5.1)
Trichuris trichiura	2 (5.1)
Hookworm	1 (2.6)

ization (Table 3); only one ALA patient presented with frank dysentery. On clinical examination all ALA patients had enlarged and tender liver, 26 (83.9%) had anemia and one patient had jaundice. Basal infiltrates in right lung was observed in 6 (19.4%) ALA and 1 (12.5%) AH cases, while liver abscess was found burst to the right lung in one patient. Right lobe was involved in 28(90.3%) ALA cases ($p<0.01$); 23(82.1%) of the right lobar abscess found posterosuperiorly ($p<0.01$). Only one(3.2%) case had both right and left lobe involvement (Table 4). The abscess was single in 29(93.5%) cases ($p<0.001$). Marked neutrophilic leukocytosis was found in 9 (29.0%) ALA and 2 (25%) AH cases.

All but two ALA and all AH cases had a serum bilirubin level within normal limits. Serum alkaline phosphatase level was raised in 22 (71%) ALA and 5 (62.5%) AH cases, ALT was raised in 1 (3.2%) ALA and none of the AH cases and prothrombin time was found raised in 6 (19.4%) ALA and 1 (12.5%) AH patients. Seven of the 8 pus samples were of anchovy sauce color and one was of cream color. No *E. histolytica* was found on microscopic examination of pus and none of the pus yielded growth of *E. histolytica* in Robinson's media. On microscopic examination of the stool samples *E. histolytica*–like cysts were found in 4 (12.9%) of the 31 ALA and hematophagus trophozoite was found in one stool sample who had frank dysentery; 3 of them yielded growth of *E. histolytica* in Robinson's media. None of stools of the 8 AH cases was positive for *E. histolytica* in microscopy and culture. The cream colored pus yielded growth of *Staphylococcus aureus* indicating super infection of the amebic abscess. Table 5 shows the various parasites found in stool of the HA patients. Among the other parasites found under microscope, *Ascaris lumbricoides* was the most common and found in 11 (28.2%) cases. More than one parasite was observed in 6 (15.4%) of the 18 stool samples, positive for intestinal parasites, and *A. lumbricoides* was common to all of them.

DISCUSSION

The objective of this study was to explore the socioeconomic status, clinical, laboratory and parasitological findings of HA patients in Bangladesh. These data do not represent the actual incidence or prevalence of HA in the country, as the cases were selected from the admitted patients in three big government hospitals of Dhaka City. It is certain that many more patients received treatment from private physicians or from private hospitals which are numerous in the country. AH is not infrequently over diagnosed by the physicians of Bangladesh due to the hyperendemicity of intestinal amebiasis, which is evident from the fact that diagnosis of AH was excluded in 13 (included initially, finally excluded from this study) of the 21 initially diagnosed and subsequently treated patients (data not shown).

In the present study, none was from high income group and the rate of infection was significantly high ($p<0.001$) in low income group than the middle income group. These findings are in accordance with other studies carried out elsewhere of the world showing higher incidence of amebic infection among the low socioeconomic group where malnutrition, poor hygiene, poor sanitary condition, contaminated drinking water and ignorance are important contributing factors. Also the prevalence of *E. histolytica* infection is highest among the lower socioeconomic group even in temperate developed countries (Walsh, 1986).

In agreement with previous studies (Aikat *et al*, 1978; Guerrant, 1986), 21 (67.7%) of the 31 ALA cases had no history of diarrhea or dysentery within the 6 months prior to hospitalization in this study, which confirms the idea that absence of previous history of diarrhea or dysentery does not exclude HA. Like many developing countries some drugs are easily available throughout Bangladesh. It is common among the general population to take metronidazole when a person develops loose motion due to any reason. In most of the occasions people stop taking drugs without completing the course after improving the acute symptoms. Thus, symptoms are masked and people may forget the mild symptoms after several weeks. This might explain the lack of prior history suggestive of intestinal

amebiasis during interview in some patients.

In the present study, 100% of the HA patients had an enlarged and painful liver which is a cardinal sign of HA described by most investigators (Sherlock, 1993; Cook, 1996; Sharma *et al*, 1996; Reed, 1998). The distribution, number and location of abscess in different lobes of liver including the age of the patients are consistent with the reports of other studies (Aikat *et al*, 1978; Jalan and Maitra, 1988; Baveja *et al*, 1992). In this study, 19.4% cases of ALA had basal infiltrates of right lung, compared with 6% to 40% in different series (Reed and Braude, 1988; Cook, 1996; Reed, 1998).

The total count of WBC below 10,000 per mm^3 of blood was recorded in 22 (71%) ALA and 6 (75%) AH cases in this study. This contrasts with the findings of other researchers who demonstrated leukocytosis as a common feature of HA patients (Geddes *et al*, 1995; Cook, 1996; Sharma, 1996). It was demonstrated that leukocytosis occurs in early stage of amebiasis, as the disease progress to chronicity, leukocyte count gradually falls, even sometimes leads to leukopenia; leukopenia was observed in 5.9% cases and normal leucocyte count in 27% cases of ALA patients (Aikat *et al*, 1978). Most of the patients of the present study admitted to the hospital during the 3rd week and onward of their illness and leukocytosis if developed in the early stage of the disease, might have fallen to the normal count by the time of hospitalization. Moreover, most of the patients came from the low socioeconomic class and were malnourished (degree of malnutrition was not assessed) which might have some influence on leukocyte response. Thus, it can be inferred that if other features are present, a normal leukocyte count does not exclude clinical suspision of HA. Liver function tests were within normal limits in most of the patients in this study with the exception of alkaline phosphatase level which was found raised in 22 (71.0%) ALA cases. It is not clear why the prothrombin time in 6 ALA patients was raised although 5 of them had normal ALAT level.

In previous studies of HA patients the detection rate of *E. histolytica* by microscopic examination was 15-33% from stool samples and 11 - 40% from pus (Aikat *et al*, 1978; Jalan and Maitra, 1988; Baveja *et al*, 1992; Sherlock, 1993). Of the 39 HA cases in this study, *E. histolytica* was detected in 5 (12.8%) stool samples and none of the 8 pus samples. The lower detection rate of *E. histolytica* in this study might be due to the fact that some patients (5 ALA and 2 AH) already started treatment with anti-amebic drugs few hours before collection of the samples examined. Similarly, only 3 of the 5 stool samples positive by microscopy were positive in culture in Robinson's media. This finding agrees well with the demonstrations of Healy (1986) but disagrees with reports of most investigators where it has been shown that culture is a more sensitive method for identification of *E. histolytica* than microscopic detection in stool samples (Gathirum and Jackson, 1985; Haque *et al*, 1993). *A. lumbricoides* was the most prevalent intestinal parasite (28.2%) associated with HA followed by *E. histolytica, Giardia lamblia, Entamoeba coli, Trichuris trichiura* and hook worm. This result is the reflection of intestinal parasitic infections among Bangladeshi population where *A. lumbricoides* is the most common intestinal parasite.

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