

## Present characteristics of symptomatic amebiasis due to *Entamoeba histolytica* in the east-southeast area of Tokyo

K. OHNISHI<sup>1</sup>\* AND M. MURATA<sup>2</sup>

<sup>1</sup> Department of Infectious Diseases, Tokyo Metropolitan Bokutoh General Hospital, 4-23-15 Kohtohbashi, Sumida City, Tokyo 130, Japan

<sup>2</sup> Nihonbashi Public Health Center, 1-1-1 Horidomechyo, Nihonbashi, Chuo City, Tokyo 103, Japan

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### SUMMARY

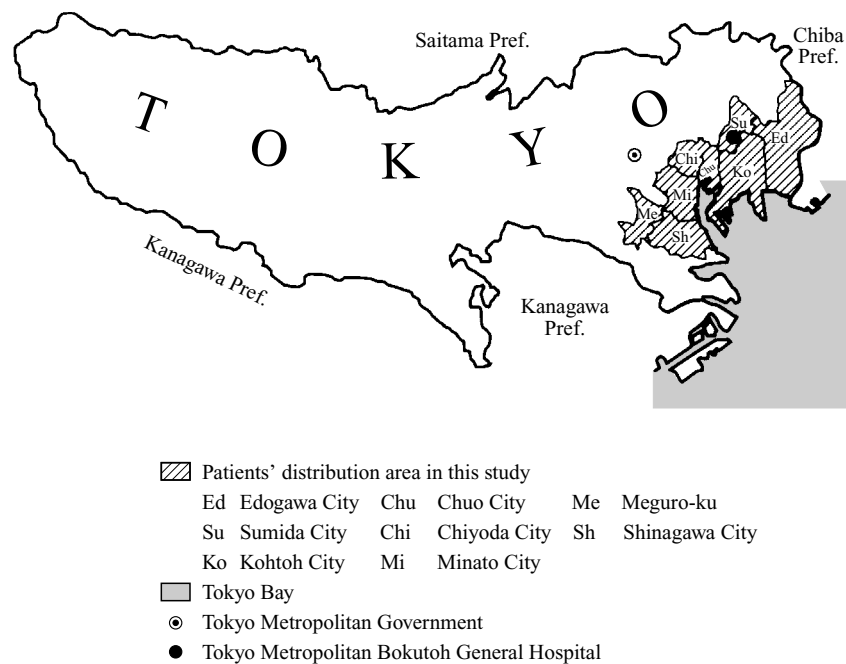
Admitted medical records, from January 1988 to December 1995, of 28 symptomatic amebic patients who lived in the east-southeast area of Tokyo were studied retrospectively, in order to find the present characteristics of symptomatic amebiasis due to *Entamoeba histolytica* in this area. Categorized by disease, there were 14 cases of colitis, 9 cases of liver abscess, 4 cases of colitis with liver abscess, and 1 case of liver abscess with brain abscess. Patients consisted of 26 Japanese males, 0 Japanese females, 1 non-Japanese male and 1 non-Japanese female. The mean age of colitis patients and liver abscess patients was 55·4 years old and 41·3 years old, respectively. The presumed place of contraction was Japan in 64% of the patients. Forty-eight percent of male patients indicated that they engaged in homosexual or bisexual practices, and 36% of male patients who denied such sexual practices or did not answer the question had no history of marriage. Positive rate of serum titre for *Treponema pallidum* hemagglutination test (TPHA) and human immunodeficiency virus antibody was 42·9% and 0%, respectively. Sixty-seven percent of TPHA-positive patients indicated that they engaged in male homosexual or bisexual practices. Zymodeme patterns of *E. histolytica* isolated from 4 colitis patients were XIV in 1 case and II in 3 cases. Symptomatic amebiasis in the east-southeast area of Tokyo is a disease which predominantly afflicts males, especially those in their middle age, and most patients contract the disease in Japan. The high rates of patients who engaged in male homosexual or bisexual practices and the high rates of patients with positive TPHA suggest that amebiasis is likely to be sexually transmitted disease in homosexual and bisexual men in the east-southeast area of Tokyo, and zymodeme II may be the predominant type in symptomatic amebic colitis in this area.

### INTRODUCTION

Symptomatic infection with *Entamoeba histolytica* shows colitis or liver abscess, or less commonly, lung or brain abscess, and fatal outcome sometimes occurs without appropriate therapy. Although amebiasis due to *E. histolytica* has a worldwide distribution, it has a higher incidence in tropical and subtropical developing countries, and often creates very serious medical

and socio-economic problems as a result. However, this protozoan infection is not common in Japan; the disease has not received a great deal of attention in this country and little is known about the present features of amebiasis locally. From a public health point of view, it is important to gather epidemiological data on amebiasis. We have reviewed our experience with symptomatic amebic patients who lived in the east-southeast area of Tokyo, and area which faces the Tokyo Bay and has a resident population of about  $227 \times 10^4$  peoples. Herein we report the characteristic

\* Author for correspondence.



**Fig. 1.** Patients distribution.

features of symptomatic amebiasis due to *E. histolytica* in this area.

## METHODS

All admitted medical records of symptomatic patients infected with *E. histolytica*, who lived in the east-southeast area of Tokyo (Edogawa City, Kohtoh City, Sumida City, Chuo City, Chiyoda City, Minato City, Meguro City and Shinagawa City, Fig. 1) and were treated from January 1988 to December 1995 at the Department of Infectious Diseases, Tokyo Metropolitan Bokutoh General Hospital, Sumida City, Tokyo were studied retrospectively.

Serum specimens were taken from 25 patients and tested for antibody to *E. histolytica* by the gel diffusion precipitin test, complement fixation test, indirect haemagglutination test, indirect fluorescent test, or enzyme-linked immunosorbent assay.

*E. histolytica* isolated from the stool of four symptomatic colitis patients who contracted the disease in Japan was available for zymodeme characterization at the Department of Tropical Medicine and Parasitology, Keio University School of Medicine, Tokyo.

## RESULTS

The disease categories, number of patients, age, sex and nationality are shown in Table 1. Age distribution of patients was as follows: among colitis cases, 5 were

in their 40s, 3 in their 70s, 2 in their 60s, 2 in their 30s, and 2 in their 50s; among cases of liver abscess, 4 were in their 30s, 2 in their 40s, 1 in his 20s, 1 in his 50s, and 1 in his 60s; among the cases of colitis with liver abscess, 1 was in her 20s, 1 in his 30s, 1 in his 40s, and 1 in his 60s. Non-Japanese patients were a 34-year-old French male with liver abscess and 27-year-old Thai female with colitis and liver abscess. Distribution and numbers of the patients were as follows; 7 lived in Shinagawa City, 4 in Minato City, 3 in Kohtoh City, 3 in Sumida City, 3 in Meguro City, 3 in Chuo City, 3 in Edogawa City, and 2 in Chiyoda City.

Rates of homosexual or bisexual practices among the male patients are shown in Table 2. Fourteen male patients denied homosexual or bisexual practices or did not answer the question, but 5 of these 14 patients had no history of marriage.

The presumed places of contraction are shown in Table 3. A Thai female patient was thought to have contracted the disease in her own country and a French male patient was believed to have contracted it in Southeast Asia.

Table 4 shows serum positive *Treponema pallidum* hemagglutination (TPHA) test and positive human immunodeficiency virus antibody (HIV-Ab) test in the patients. Eight of 12 TPHA-positive patients indicated that they engaged in male homosexual or bisexual practices.

The seropositivity for *E. histolytica* infection are summarized in Table 5.

Table 1. *Patients' profiles*

	Number of patients	Age (years) mean	Sex		Nationality	
			Male	Female	Japan	Foreign
Colitis	14	33–78 55.4	14	0	14	0
Liver abscess	9	27–66 41.3	9	0	8	1*
Colitis with liver abscess	4	27–69 45.5	3	1	3	1†
Liver abscess with brain abscess	1	51	1	0	1	0
Total	28	27–78 49.3	27	1	26	2

\* French male; † Thai female.

Table 2. *Homosexual or bisexual practice in male patients*

	Number of patients	Homosexuality or bisexuality	
		Indicated (%)	Denied or undetermined (%)
Colitis	14	6 (42.9)	8 (57.1)
Liver abscess	9	3 (33.3)	6 (66.7)
Colitis with liver abscess	3	3 (100.0)	0 (0.0)
Liver abscess with brain abscess	1	1 (100.0)	0 (0.0)
Total	27	13 (48.1)	14 (51.9)

Table 3. *Presumed place of contraction*

	Number of patients	Place		
		Japan (%)	Other country (%)	Unknown (%)
Colitis	14	11 (78.6)	1 (7.1)	2 (14.3)
Liver abscess	9	4 (44.4)	3 (33.3)	2 (22.2)
Colitis with liver abscess	4	2 (50.0)	1 (25.0)	1 (25.0)
Liver abscess with brain abscess	1	1 (100.0)	0 (0.0)	0 (0.0)
Total	28	18 (64.3)	5 (17.9)	5 (17.9)

Table 4. *Seroprevalence of positive TPHA and HIV antibody test*

	TPHA (%)	HIV (%)
Colitis	5/14 (35.7)	0/7 (0.0)
Liver abscess	5/9 (55.6)	0/7 (0.0)
Colitis with liver abscess	2/4 (50.0)	0/2 (0.0)
Liver abscess with brain abscess	0/1 (0.0)	0/1 (0.0)
Total	12/28 (42.9)	0/17 (0.0)

Table 5. *Seropositivity for E. histolytica infection*

	Number of patients	
	Examined	Positive (%)
Colitis	11	11 (100)
Liver abscess	9	9 (100)
Colitis with liver abscess	4	4 (100)
Liver abscess with brain abscess	1	1 (100)
Total	25	25 (100)

Zymodeme types of *E. histolytica* isolated from 4 colitis patients were as follows; 3 were types II, 1 was XIV.

All patients were treated with anti-amebic drugs and good therapeutic results were obtained.

## DISCUSSION

This study has brought to light several findings on symptomatic *E. histolytica* infection in the east-southeast area of Tokyo.

With the exception of one Thai female, all patients in our study were male, and about  $\frac{2}{3}$  of all patients were between 30 and 59 years old. These findings indicate that symptomatic amebiasis is a disease which almost exclusively afflicts males, especially those in their middle age. The high rate of patients who engaged in male homosexual or bisexual practices, the high rate of patients with positive TPHA, and the very small number of female patients suggest that amebiasis is likely to be a sexually transmitted disease in male homosexuals and bisexuals in this area.

About half of the male patients in our study indicated that they engaged in homosexual or bisexual practices. Since about  $\frac{1}{3}$  of the patients who denied engaging in homosexual or bisexual practices or did not answer the question had no history of marriage, the true number of practicing homosexuals or bisexuals may be higher. In our study, symptoms were related to the infection with *Entamoeba* even in the male patients who engaged in homosexual or bisexual practices. In recent years, several reports have appeared concerning the high prevalence of *Entamoeba* infections in homosexual men living in big cities of Western countries [1–3]. Few symptomatic *Entamoeba* colitis [4] or liver abscess cases [5] are reported in male homosexuals in Western countries, but many studies indicated that no relation was seen between the presence or absence of gastrointestinal symptoms and infection with *Entamoeba* in male homosexuals [2, 3, 6, 7]. It is reported that zymodeme pattern of *Entamoeba* isolated from homosexual men in England were non-pathogenic-type I, III and V [6], and non-pathogenic-type I, III and VIII [7]. Although it had been thought that pathogenic and non-pathogenic strains are present in *E. histolytica* [8, 9], it was proved that the two strains are different genetically [10–12]. Thus, under the newly revised nomenclature, the pathogenic strain is *E. histolytica* Schaudinn, 1903 (emended Walker, 1911), and the non-pathogenic

strain is *E. dispar* Brumpt, 1925 [13]. *E. histolytica* can not be differentiated morphologically from *E. dispar*. Although it is thought that the predominant *Entamoeba* species in male homosexuals in Western countries is *E. dispar*, since symptoms of our patients related to the infection with *Entamoeba* and serum antibodies to *E. histolytica* were detected in all of our examined patients, we concluded that the species infecting our patients, even our male patients who engaged in homosexual or bisexual practices, was *E. histolytica*.

The fact that about  $\frac{2}{3}$  of the patients contracted the disease in Japan suggests that *E. histolytica* is indigeneous to Japan, and although the number of isolates analysed is too small, the results of our zymodeme analysis indicate that zymodeme II *E. histolytica* may be the predominant type in symptomatic patients in the east-southeast area of Tokyo.

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## REFERENCES

1. Ortega HB, Borchardt KA, Hamilton R, Ortega P, Mahood J. Enteric pathogenic protozoa in homosexual men from San Francisco. *Sex Transm Dis* 1984; **11**: 59–63.
2. Markell EK, Havens RF, Kuritsubo RA, Wingerd J. Intestinal protozoa in homosexual men of the San Francisco bay area: prevalence and correlates of infection. *Am J Trop Med Hyg* 1984; **33**: 239–45.
3. Keystone JS, Keystone DL, Proctor EM. Intestinal parasitic infections in homosexual men: prevalence, symptoms and factors in transmission. *Can Med Assoc J* 1980; **123**: 512–4.
4. Burnham WR, Reeve RS, Finch RG. *Entamoeba histolytica* infection in male homosexuals. *Gut* 1980; **21**: 1097–9.
5. Thompson JE, Freischlag J, Thomas DS. Amebic liver abscess in a homosexual men. *Sex Transm Dis* 1983; **10**: 153–5.
6. Goldmeier D, Sargeant PG, Price AB, et al. Is *Entamoeba histolytica* in homosexual men a pathogen? *Lancet* 1986; **i**: 641–4.
7. Allison-Jones E, Mindel A, Sargeant P, Katz D. Outcome of untreated infection with *Entamoeba histolytica* in homosexual men with and without HIV antibody. *B M J* 1988; **297**: 654–7.
8. Sargeant PG, Williams JE, Grene JD. The differ-

- entiation of invasive and non-invasive *Entamoeba histolytica* by isoenzyme electrophoresis. *Trans Roy Soc Trop Med Hyg* 1978; **72**: 519–21.
9. Gathiram V, Jackson TFHG. A longitudinal study of asymptomatic carriers of pathogenic zymodemes of *Entamoeba histolytica*. *S Afr Med J* 1987; **72**: 669–72.
  10. Tannichi E, Horstmann RD, Knobloch J, Arnold HH. Genomic DNA differences between pathogenic and nonpathogenic *Entamoeba histolytica*. *Proc Natl Acad Sci USA* 1989; **86**: 5118–22.
  11. Tannichi E, Buchard GD. Differentiation of pathogenic from non-pathogenic *Entamoeba histolytica* by restriction fragment analysis of a single gene amplified *in vitro*. *J Clin Microbiol* 1991; **29**: 250–5.
  12. Blanc DS. Determination of taxonomic status of pathogenic and non-pathogenic *Entamoeba histolytica* zymodemes using isoenzyme analysis. *J Protozool* 1992; **39**: 471–9.
  13. Diamond LS, Clark CG. A redescription of *Entamoeba histolytica* Schaudinn, 1903 (emended Walker, 1991) separating it from *Entamoeba dispar* Brumpt, 1925. *J Euk Microbiol* 1993; **40**: 340–4.