PREVALENCE OF *BLASTOCYSTIS HOMINIS* INFECTION IN ASYMPTOMATIC INDIVIDUALS FROM BANGKOK, THAILAND

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Abstract. Fresh stool examination was performed from 2,230 participants who enrolled in annual check-up programs of the Faculty of Medical Technology, Mahidol University in 1999-2000 and 2004. In this study, *Blastocystis hominis* infection was diagnosed by culturing in Jones' media. A total of 21% of fecal specimens (in 1999-2000) and 13.7% (in 2004) were positive for *B. hominis*. The vacuolated form was the predominant form found in culture solution after 48 hours of incubation. The distribution of infection was highest between the ages of 21-30 years ($p<0.05$). There was no significant difference in infection between male and female groups. Other parasites, *eg Giardia lamblia*, *Entamoeba histolytica*, *Entamoeba coli*, *Endolimax nana*, *Trichomonas hominis*, *Strongyloides stercoralis*, *Opisthorchis viverrini* and *Taenia* species, were also found by fresh stool examination.

INTRODUCTION

Blastocystis hominis is a unicellular protozoan most commonly found in fresh fecal specimens in numerous forms (vacuolar, amoeboid, granular, and cyst) and size (2-200 μm in diameter) (Stenzel and Boreham, 1996). The organism is transmitted by fecal-oral route and wide spread in several developing countries (Suresh *et al*, 2001). Although the pathogenicity of *B. hominis* is controversial, diagnosis and treatment are still needed in symptomatic cases (Zaki *et al*, 1991; Lamom *et al*, 1992; Sinniah and Rajeswari, 1994; Oyofo *et al*, 2002). Laboratory diagnosis is routinely based on microscopic examination, but the variety of *B. hominis* morphologies in fecal specimens can result in incorrect identification. The culture method has been used to confirm the diagnosis due to its higher sensitivity and specificity. This study was undertaken to determine the prevalence of *B. hominis* infection in asymptomatic individuals by using direct smear and culture method.

MATERIALS AND METHODS

A total of 2,230 fecal specimens were collected from participants enrolled in annual check-up programs of the Faculty of Medical Technology, Mahidol University in 1999-2000 and 2004. Each specimen was collected in a clean plastic container, provided a day prior to collection. The fecal specimens were examined at the Department of Parasitology by direct smear and culture method. For culture method, Jones' medium, consisting of 1% yeast extract and 20% human serum in buffered saline (Jones, 1946), was used since it is a common medium to survey for *Blastocystis* spp infection (Chuong *et al*, 1996; Chen *et al*, 1997). Approximately 50 mg of feces was inoculated in a 15x125 mm screw-capped tube containing 3 ml of Jones' medium. The inoculated media were incubated at 37°C for 72 hours and a drop of cultured medium was then smeared on a glass slide, covered with a cover slip, and examined for the presence of *B. hominis* under a light microscope at 400× magnification.

RESULTS

A total of 17.4% (388/2,230) of fecal specimens was positive for *B. hominis*. The prevalence (13.7%) of *B. hominis* in 2004 was lower than the prevalence (20.9%) during 1999-2000 (Table 1). The comparison of *B. hominis* infection between age groups in 1999-2000 and 2004 is presented in Table 1 and Fig 1. The distribution of infection in 1999-2000 was highest in the age group 21-30 years ($p<0.05$) followed by the age group 41-50 years (Table 1 and Fig 1). There was no significant difference in *B. hominis* infection between males and females ($p>0.05$).

The predominant vacuolar form (with a range of 10-50 μm in diameter, large central body and a rim of cytoplasm and nucleus) was commonly observed in culture medium by light microscope (Fig 2). The granular form was rarely observed after 72 hours incubation, whereas cyst and amoeboid forms were not observed. Of all *B. hominis* positive specimens, 5.9% (22/388) were found to contain other intestinal

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Table 1
Prevalence of *B. hominis* infection by gender and age groups in 1999-2000 and 2004.

	Prevalence by gender			Prevalence by age groups (years)			
	Male	Female	Total	21-30	31-40	41-50	>50
Prevalence during 1999-2000							
No. examined	542	605	1,147	165	353	457	172
No. positive	111	129	240	49[a]	70	100	21
(%)	(20.5)	(21.3)	(20.9)	(29.7)	(19.8)	(21.9)	(12.2)
Prevalence in 2004							
No. examined	457	626	1,083	156	305	347	275
No. positive	62	86	148	24	42	51	31
(%)	(13.6)	(13.7)	(13.7)	(15.4)	(13.8)	(14.7)	(11.3)

[a] significant difference among others age groups ($p<0.05$).

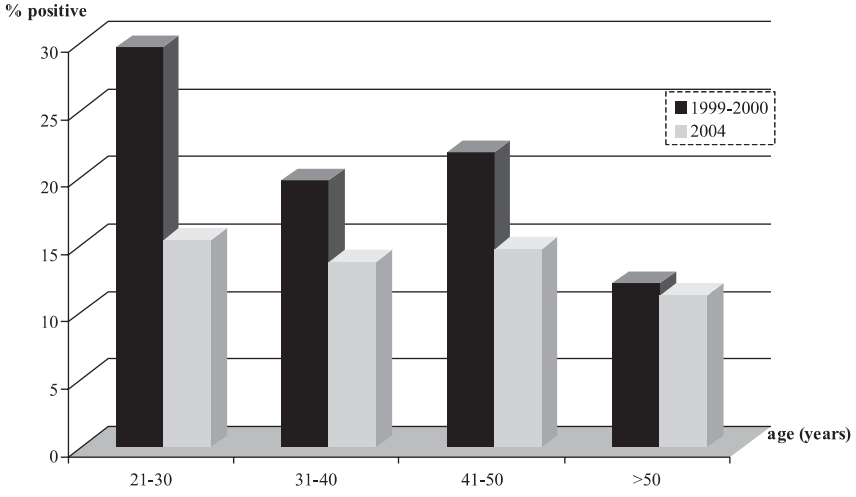

Fig 1- The comparison of *B. hominis* infection between age groups in 1999-2000 and 2004.

parasites, *eg Entamoeba histolytica, Giardia lamblia* and *Endolimax nana* (Table 2).

DISCUSSION

The high prevalence of *B. hominis* was similar to those of asymptomatic individuals from the Thai Army (Taamasri *et al*, 2000) and several reports from developing countries (Horiki *et al*, 1997; Rajah *et al*, 1999). The increasing rate of *B. hominis* infection is associated with poor environmental hygiene (Rajah Salim *et al*, 1999; Taamasri *et al*, 2000). Recent studies have shown that the organism could be zoonotic, since high prevalence of *Blastocystis* spp was observed in domestic pets, livestock, reptiles, rodents and insects (Chuong *et al*, 1996; Chen *et al*, 1997; Duda *et al*, 1998; Abe *et al*, 2002). The lower prevalence observed in 2004 may implicate an improvement in hygiene of the studied population. The distribution of infection was highest in persons aged 21-30 years ($p<0.05$) in 1999-2000. However, there was no significant difference in infection between males and females as shown in previous reports (Suresh *et al*, 2001).

Prevalence of *B. hominis* infection was two times greater by culture method (17.4%) compared to direct smear (8.5%) which correlated to other studies (Zaman and Khan, 1994). This was probably due to the fact that light infection with *B. hominis* is common

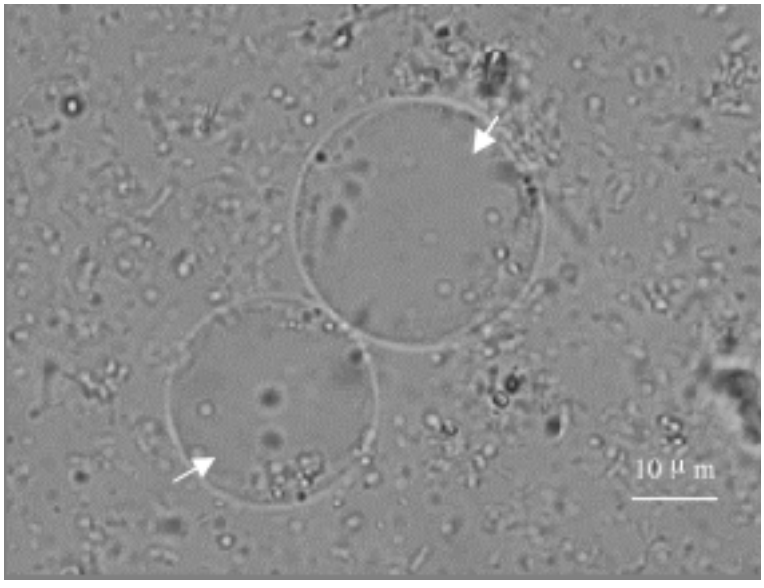

Fig 2- Light micrograph of vacuolar form of *B. hominis* in culture media (40x). The large vacuole is indicated by arrows.

Table 2
The prevalence of parasitic infections examined by direct smear.

Parasite species	1999-2000 (N=1,147)		2004 (N=1,083)	
	No. positive	%	No. positive	%
Single infection				
Entamoeba histolytica	4	0.4	1	0.1
Giardia lamblia	5	0.4	4	0.4
Entamoeba coli	7	0.6	4	0.4
Trichomonas hominis	4	0.4	3	0.3
Endolimax nana	2	0.2	3	0.3
Strongyloides stercolaris	2	0.2	0	0
Opisthorchis viverini	0	0	0	0
Teania spp	0	0	1	0.1
Mixed infection with *Blastocystis hominis*				
Entamoeba histolytica	6	0.5	0	0
Giardia lamblia	5	0.4	2	0.2
Entamoeba coli	1	0.1	1	0.1
Trichomonas hominis	0	0	0	0
Endolimax nana	2	0.2	4	0.4
Strongyloides stercolaris	0	0	0	0
Opisthorchis viverini	1	0.1	0	0
Teania spp	0	0	0	0
Total	39	3.4	23	2.3

and organisms can be easily missed using direct microscopy.

In conclusion, numerous and predominant vacuolar forms of *B. hominis* detected in culture medium made the technique appropriate for prevalence study. High prevalence of *B. hominis* infection in asymptomatic individuals suggests that clinicians should give more consideration to this parasite.

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