

Seasonal Prevalence of *Blastocystis hominis* in Wadi Al-Shati province, southwest, Libya

Mohamed Al-Shebani Mohamed,* Abdul Hafeez Khan,** Awatif Mohamed Abdalsalam,*
Eljelani Salim Saad,*

Abstract:

A total of 647 stool samples were obtained from patients, who came to laboratory of Medical Laboratory Science Department of Engineering and Technology Faculty in Wadi Al-Shati province, southern west, Libya for stool examination. Monthly and seasonal prevalences of *Blastocystis hominis* were evaluated in period from March 2004 to February 2008. The result indicated that the highest prevalence was in the summer season (June to August). Significant different in the prevalence of *B. hominis* infection was found between the summer and winter seasons ($p < 0.05$). These results revealed that *B. hominis* infection is probably related to weather condition, being more common in hot weather or summer season, therefore the results indicated that there was a possible seasonality of *Blastocystis hominis* infection.

Introduction:

Blastocystis hominis is a common inhabitant of human intestinal tract was first described by Alexief A.¹ Since its discovery controversy has surrounded both the taxonomy and pathogenicity.² Although the taxonomy of this organism has only recently been resolved³⁻⁴ debate continues on the pathogenic potential of organism^{2,5,6} because organism has been found both in symptomatic and asymptomatic individuals.⁷ It has been described as a non-pathogenic protozoan parasite, but now it is increasingly recognized as a possible cause of gastrointestinal symptoms.⁸⁻¹¹

Blastocystis hominis was reported to be transmitted by fecal-oral route through contaminated food and water and the cyst form could be infective stage.¹²⁻¹⁴

Blastocystis hominis has a worldwide distribution with infection more common in tropical and subtropical countries. Prevalence rates of more than 50% have been reported in developing countries.^{2,6} The prevalence is higher among people in tropical countries, immigrants, travelers from epidemic area and lower socioeconomic persons.¹⁵ The occurrence of *B. hominis* infection has been reported is related to weather conditions with suggestion that infections are more common during hot weather or summer than winter or spring.^{10,16}

Studies on frequent of *B. hominis* are rather few in Libya with relatively high prevalence, these studies reported prevalence rates ranged from 6.7 to 29.6%.^{10,17-20}

Although there is many informations concerning this parasites available still there is

controversy about its seasonal occurrence, therefore the objective of the present study was to investigate the seasonal prevalence of *B. hominis* in Wadi Al-Shati province, southwest, Libya.

Materials and Methods:

During the period of 1st of March 2004 to end of February, a total of 647 stool specimens were obtained from patients who came to Medical Laboratory Science Department of Engineering and Technology Faculty in Wadi Al-Shati province, southern west, Libya for stool examination. The specimens were examined by direct saline and iodine mounts as described by Cheesbrough M.²¹ Monthly and seasonal prevalences of *Blastocystis hominis* were evaluated according to the concepts described by Margolis *et al.*²² Statistical analysis was performed by Chi-square test. The differences were considered to be statistically significant when p -value was less than 0.05.

Results:

The monthly prevalence of *Blastocystis hominis* showed fluctuations over the four years of study, ranged from 5.2% to 50% the lowest was in April 2004 and the highest was in February 2006, respectively, and no single infection in few months (Table 1).

The results indicated that seasonal prevalence of *B. hominis* infection vary from 3.33% to 30.6%, the lowest was in spring 2008 season and highest was in summer 2004 season respectively.

*) Medical Laboratory Department, Faculty of Engineering and Technology, Brack, Sebha University.

**) Medical Parasitology Department, Faculty of Medicine, Sebha University.

The prevalence of *B. hominis* infection was slightly high in summer season (ranged from 6.38% to 30.6%) and slightly low in winter seasons (ranged from 4.0% to 25.0%) The infection rate in spring season ranged from 3.33% to 16.3%, while in autumn was ranged from 4.17% to 22.2% (Table 2 and Fig. 1). Significant difference in prevalence of *B.*

hominis infection was found between summer and winter seasons ($p < 0.01$), and between summer and autumn seasons ($p < 0.05$), meanwhile there is no significant difference between summer and spring season ($p > 0.05$). The results suggested there was a possible seasonality of *B. hominis* infection.

Table 1: The monthly prevalence of *B. hominis* in Wadi Al-Shati province, southwest, Libya.

Month	Year														
	2004			2005			2006			2007			2008		
	Examined.	infected	prevalence (%)	Examined.	infected	prevalence (%)	examined	infected	prevalence (%)	Examined.	infected	prevalence (%)	Examined.	infected	prevalence (%)
Jan.	-	-	-	9	2	22.2	17	3	17.6	5	1	20.0	12	4	33.3
Feb	-	-	-	13	2	15.3	12	6	50.0	10	0	0.0	8	1	12.5
Mar.	10	1	10.0	27	7	25.9	14	2	14.2	7	0	0.0	10	0	0.0
Apr.	19	1	5.2	21	0	0.0	18	3	16.6	12	2	16.6	11	1	9.0
May	21	6	28.5	14	1	7.1	17	3	17.6	15	1	6.6	9	0	0.0
Jun.	11	2	18.1	15	1	6.6	15	3	20.0	12	2	16.6			
Jul.	16	5	31.2	17	1	5.8	16	2	12.5	7	0	0.0			
Aug.	9	4	44.4	15	1	6.6	16	4	25.0	7	1	14.2			
Sep.	8	1	12.5	15	4	26.6	7	0	0.0	11	1	9.0			
Oct.	16	1	6.2	12	1	8.3	10	1	10.0	10	1	10.0			
Nov.	15	5	33.3	18	5	27.7	7	0	0.0	11	0	0.0			
Dec.	10	1	10.0	12	2	16.6	10	0	0.0	8	2	25.0			

Table 2: Seasonal prevalence of *B. hominis* infection in Wadi Al-Shati province, southwest, Libya.

Season	Examined	Infected	Prevalence (%)
Spring 2004 (March, April, May)	50	8	16.0
Summer 2004 (June, July, August)	36	11	30.6
Autumn 2004 (September, October, November)	39	7	17.9
Winter 2004-5 (December, January, February)	32	5	15.6
Spring 2005 (March, April, May)	62	8	12.9
Summer 2005 (June, July, August)	47	3	6.38
Autumn 2005 (September, October, November)	45	10	22.2
Winter 2005-6 (December, January, February)	41	11	26.8
Spring 2006 (March, April, May)	49	8	16.3
Summer 2006 (June, July, August)	47	9	19.1
Autumn 2006 (September, October, November)	24	1	4.17
Winter 2006-7 (December, January, February)	25	1	4.00
Spring 2007 (March, April, May)	34	3	8.82
Summer 2007 (June, July, August)	26	3	11.53
Autumn 2007 (September, October, November)	32	2	6.25
Winter 2007-8 (December, January, February)	28	7	25.00
Spring 2008 (March, April, May)	30	1	3.33

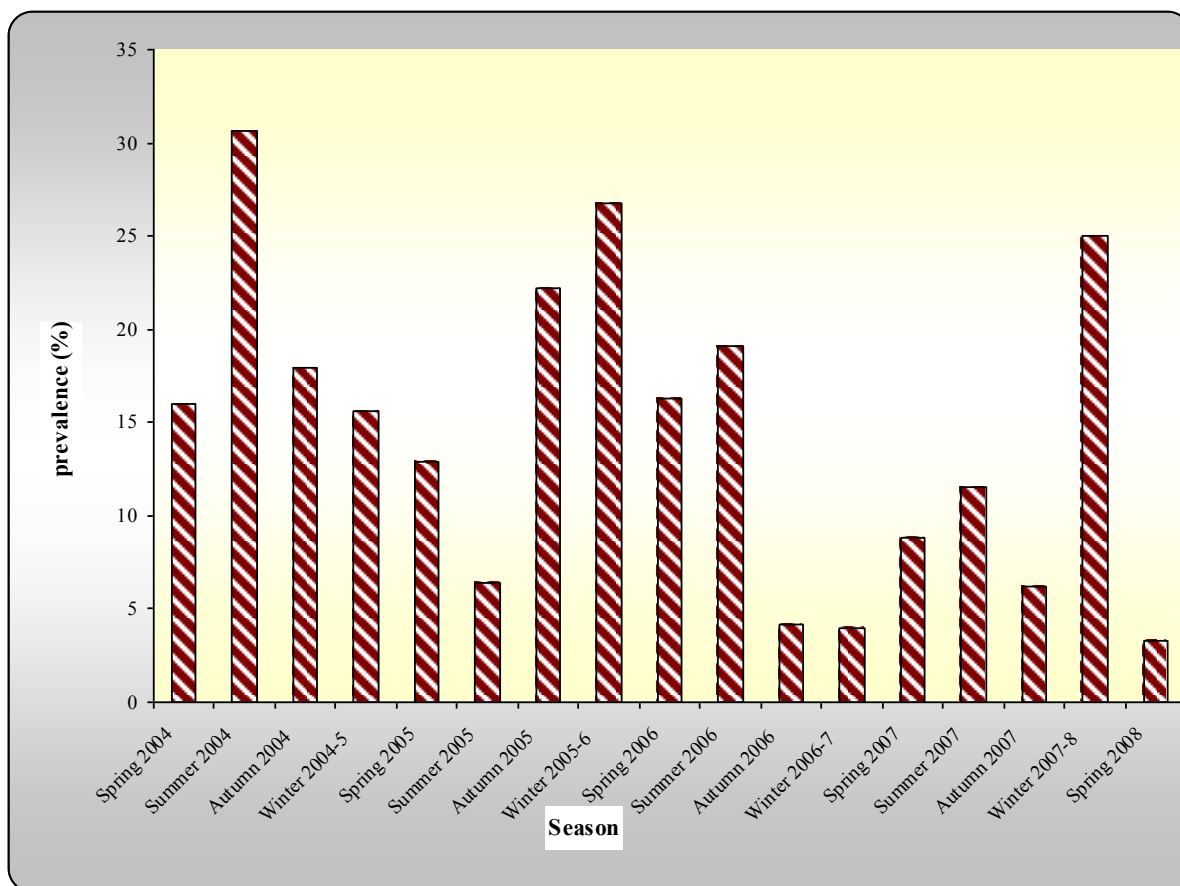


Fig 1: Seasonal prevalence of *B. hominis* in Wadi Al-Shati province, southwest, Libya.

Discussion:

This work describes the changes observed in the seasonal prevalence of *B. hominis* in Wadi Al-Shati, Province, Libya over four years. The results of his study revealed that prevalence of *B. hominis* is widespread through the year with particular summer seasonal prevalence peak. These findings are consistent with findings by Mohammed *et al.*,¹⁰ who reported that the infection was most common during summer and suggested that dry climatic conditions of Sebha city, Libya, favor the survival and transmission of the organism throughout the summer season in the population. Wadi Al-Shati province is neighborhood of Sebha city (about 70 Km away) and had same climatic conditions which are like to be favoring the development, transmission and frequency of prevalence of *B. hominis* in different rural localities of this region.

Prevalence of *B. hominis* has also been found more during warm and hot season of the year

in the other parts of the world.^{16,23} However, Rhongbutrsi²⁴ found significant differences in the prevalence between rainy and cool seasons and also rate was higher in summer than spring and winter.

Regarding the monthly prevalence of *B. hominis*, marked variation was observed (Table 1) (probably due to samples size), although some increase toward the summer months (June-August) However, this finding consistent with a study conducted in United States reported that the highest prevalence was between August and October.²⁵ The effect of climate on survival and persistence of *B. hominis* in the environment may affect on its prevalence.

In conclusion, this study suggested that *B. hominis* infection is probably related to weather condition, being more common in hot weather or summer season, therefore there was a possible seasonality of *B. hominis* infection.

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