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Incidence of Intestinal Amebas in Persistent Diarrheic Patients*

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慢性泄瀉患者에서의 腸內아메바 感染狀

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1979年 3月부터 1981年 2月까지 慢性泄瀉와 痢疾樣症狀으로 慶北醫大 附屬病院에 來院하여 寄生虫學敎室에서 原虫檢査를 받은 被檢者에서의 各種 아메바의 檢出狀을 究明함과 함께 李(1979)의 成績과 比較하였다.

아메바의 同定에는 iron-hematoxylin 染色法을 使用하였다. 被檢者 2,083名 중 痢疾아메바 胞囊의 檢出率은 54.6%, 大腸아메바의 그 率은 8.4%였으며 矮少아메바와 沃度아메바는 各各 1.2% 및 0.8%로 드물게 檢出되었다.

痢疾아메바胞囊의 性別檢出率에 있어서는 男女間에 有意的 差를 認定할 수 없었으며, 年齡別로는 20~29歲群에서 最大値, 0~9歲群에서 最少値를, 月別로는 8月에 最大値, 10月에 最少値를 나타내었고, 總檢出率은 1979年에 比해 1981年에 높았다.

Introduction

The prevalence of *Entamoeba histolytica* among the clinical amebiasis patients exhibiting the vague abdominal discomfortness, persistent diarrhea, weakness, and irregular colicky abdomial pain without fever has been reported by investigators(Lim et al., 1965; Kim, 1971; and Choi and Hwang, 1980).

Lim et al. (1965) conducted a survey on the intestinal amebiasis in Cheon-pyeong area, Kyung-gi Province, and found that the demonstration rate for the *E. histolytica* in 80 persistent diarrheic patients was found to be 73.7 per cent, and the ratio of the large race

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versus the small race *E. histolytica* was 1 : 3.

In a study of amebiasis taken in the Pusan city by Kim(1971a and b) found relatively low *E. histolytica* infections, i.e., 2.6 per cent among the home and 9.1 per cent among the instituted children.

However, a high prevalence of *E. histolytica* was reported by Lee(1979) in the Taegu city that 45.5 per cent of the patients who visited the Kyungpook National University Hospital were infected with the protozoa, and there was no significant difference in the demonstration of *E. histolytica* between males and females.

Quite recently, Choi and Hwang(1980) reported that the positive rate for *E. histolytica* in 735 fecal specimens collected from urban and rural school children was 26.9 per cent, with no significant difference in the rate of infection between urban and rural children.

These surveys revealed that the demonstration rate for *E. histolytica* among the patients thought to be amebiasis is extraordinarily high.

The study presents the recent prevalence of *E. histolytica* among the clinical amebiasis patients of the Kyungpook National University Hospital, and compares with the data reported by Lee(1979).

Materials and Methods

From March, 1979 to February, 1981, the fecal specimens of the patients exhibiting symptoms ascribed to be amebiasis, i.e., the vague abdominal discomfortness, persistent diarrhea, weakness, irregular colicky abdominal pain, and no fever, were collected. The specimens were examined in the Department of Parasitology, Kyungpook National University School of Medicine, Taegu, Korea.

In order to discover the trophozoites of amebas, a small portion of diarrheic or fluid feces was mixed with a drop of warm normal saline on a clean slide, a coverslip was placed on the preparation, and then examined under a microscope.

To discover the cysts, the solid or formed feces were first examined by the formalin-ether concentration(Ritchie, 1948), and the Lugol's iodine solution was then added to the sediment of each tube.

When the cysts were found, the fresh stool specimens were subjected to the iron-hematoxylin technique for the staining of cysts.

The diameter of *E. histolytica* cysts was measured by the ocular micrometer and divided into two groups. The cysts which had more than 10μ were determined as large race, less than 10μ were small race.

Results

Table 1 presents the species of intestinal amebas found in 2,083 chronic diarrheic patients visited Kyungpook National University Hospital.

The demonstration rate for *E. histolytica* cysts was the higest, 54.6 per cent, followed by *E. coli* and *Endolimax nana*, 8.4 and 1.2 per cent. The least frequently found was *Iodamoeba bütschlii*, 0.8 per cent, but *Dientamoeba fragilis* was absent.

Table 1. Incidence of intestinal Amebas in chronic diarrheal patients visited University Hospital(1981)

Species	Male		Female		Total	
	No. infected	%	No. infected	%	No. infected	%
Entameba histolytica	733	55.2	404	53.6	1,137	54.6
Entameba coli	108	8.1	66	8.8	174	8.4
Endolimax nana	14	1.1	11	1.5	25	1.2
Iodameba bütschlii	7	0.5	10	1.3	17	0.8
No. tested	1,329		754		2,083	

Table 2. Age-specific rates for *Entameba histolytica* in chronic diarrheal patients(1981)

Age group (Y)	Male			Female			Total		
	No. exam.*	No. pos.**	% pos.***	No. exam.	No. pos.	% pos.	No. exam.	No. pos.	% pos.
0— 9	314	125	39.8	170	70	41.2	484	195	40.3
10—19	110	53	48.2	51	29	56.9	161	82	50.9
20—29	217	139	64.1	108	73	67.6	325	212	65.2
30—39	256	155	60.5	171	95	55.6	427	250	58.5
40—49	234	155	66.2	130	70	53.8	364	225	61.8
50—59	136	76	55.9	84	49	58.3	220	125	56.8
60—	62	30	48.4	40	18	45.0	102	48	47.1
Total	1,329	733	55.2	754	404	53.6	2,083	1,137	54.6

*: No. examined. **: No. positive. ***: Percent positive.

Table 3. Monthly incidence of *Entameba histolytica* in chronic diarrheal patients(1981)

Month	Male			Female			Total		
	No. exam.	No. pos.	% pos.	No. exam.	No. pos.	% pos.	No. exam.	No. pos.	% pos.
January	102	55	53.9	48	32	66.7	150	87	58.0
February	75	48	64.0	44	21	47.7	119	69	58.0
March	113	64	56.6	58	34	58.6	171	98	57.3
April	125	72	57.6	59	35	59.3	184	107	58.2
May	111	55	49.5	89	47	52.8	200	102	51.0
June	158	79	50.0	91	47	51.6	249	126	50.6
July	160	81	50.6	94	51	54.3	254	132	52.0
August	169	106	62.7	105	59	56.2	274	165	60.0
September	107	64	59.8	57	32	56.1	164	96	58.5
October	65	36	55.4	42	12	28.6	107	48	44.9
November	73	36	49.3	32	18	56.3	105	54	51.4
December	71	37	52.1	35	16	45.7	106	53	50.0
Total	1,329	733	55.2	754	404	53.6	2,083	1,137	54.6

Both the small and the large races of *E. histolytica* were found among the positive patients, in which, the small race of *E. histolytica* showed a predominance in the patients, i. e., 60.5 per cent as compared with 39.5 per cent.

The rates of *E. histolytica* cysts among the chronic diarrheic patients by age and sex are compiled in Table 2.

There was no significant in the demonstration of the cyst between males and females, 55.2 per cent of positive patients were males and 53.6 per cent were females ($t<2$).

At the same time, the rate for *E. histolytica* among the patients was not so apparent from age to age. The rate was 40.3 per cent in the 0—9 year old group. The rate then increased to 50.9 per cent in the 10—19 year old group and reached a peak, 65.2 per cent in the 20—29 year old group, dropped to 58.5 per cent in the 30—39 year old group, after which it was somewhat constant, ranging from 47.1 to 61.8 per cent.

The monthly demonstration rates for *E. histolytica* among the patients in 1981 are summarized in Table 3.

The domonstration rate for the protozoa revealed a maximum, 60.0 per cent, in August and a minimum, 44.9 per cent, in October. However, there was no significant difference

Table 4. Comparison of demonstration rates for ***Entameba histolytica*** in chronic diarrheal patients by age groups in 1979 and 1981

Age group (Y)	Lee(1979)			Authors(1981)			t-value
	No. exam.	No. pos.	% pos.	No. exam.	No. pos.	% pos.	
0— 9	176	64	36.4	484	195	40.3	0.9
10—19	67	27	40.3	161	82	50.9	1.5
20—29	139	71	51.1	325	212	65.2	2.8
30—39	199	98	49.2	427	250	58.5	2.2
40—49	151	71	47.0	364	225	61.8	3.1
50—59	85	38	44.7	220	125	56.8	1.9
60—	43	22	51.2	102	48	47.1	0.5
Total	860	391	45.5	2,083	1,137	54.6	4.5

in the demonstration rate in the other months of the year studied, being around 50 per cent.

In Table 4, the demonstration rates for *E. histolytica* in chronic diarrheic patients by Lee (1979) are compared with those in the present study.

In general, the rates in the both 0—9 and 10—19 year old groups were constant in the period from 1979 to 1981. Thus, t-values in the both age groups were not significant($t<2$).

But contrast, the rates in the 20—29, the 30—39, and the 40—49 year old groups were signicantly elevated. The values in each group were significant ($t>2$).

However, the values in the 50—59, and more than 60 year old groups were not significant ($t<2$).

When the overall demonstration rate for *E. histolytica* in 1979 are compared with those in 1981, significant difference in the rate was encountered, 45.5 per cent in 1979 and 54.6 per cent in 1981, with a t-value of 4.5.

Discussion

The demonstration rate for intestinal amebas in this paper are based on a single examination of the iron-hematoxylin preparations in 2,083 clinical amebiasis patients.

In practice, a single examination of the iron-hematoxylin technique is not sufficient to obtain the reliable prevalence of intestinal amebas, and four or more examinations are required.

However, the results in the present survey are comparable to the date of previous surveys because they were based on a single examination and laboratory procedures were similar.

In the present study, a total of 2,083 fecal specimens collected from the patients revealing symptoms ascribed to be intestinal amebiasis were examined, and the overall positive rate for *E. histolytica* was found to be 54.6 per cent with no significant difference in the rate of infection between males and females.

The reliable prevalence of intestinal amebas among the patients in the vicinity of Taegu is not determined, but a report by Lee(1979) indicated that 45.5 per cent of the patients was infected, This rate of infection is low than that found in our rate of 54.6 per cent.

Similar results have been obtained by several investigators(Lim et al., 1965; Kim, 1971; and Choi and Hwang, 1980). Lim et al. (1965) reported that sex difference were not great as a whole, but the predominance of small race of *E. histolytica* was recognized. these results agree well with the data of Kim (1971), Choi and Hwang(1980) and ours.

It is assumed on the basis of the results by Lim et al. (1965) and Lee(1979) that the positive rates for *E. histolytica* cyst in the clinical amebiasis patients varied from 45.5 to 73.7 per cent.

As might be expected, these results are

higher than the data obtained in the general population of Korea, the reported prevalence of *E. histolytica* are 36.0 per cent in Koreans and 27.0 per cent in the foreigners in Korea by Kessel(1925), 30.2 per cent in 3,000 residents in the vicinity of Seoul by Choi(1926), 12.5 per cent by Chiba(1931), 5.0 per cent by Hunter et al. (1949), 39.9 per cent in *E. histolytica* carriers and 5.0 per cent in the South Korean civilians by Brook et al.(1956).

In recent years, Soh et al.(1961) carried out a survey of intestinal protozoa in the Seoul area, and found that the prevalence of *E. histolytica* was 4.3 per cent in 10,320 residents, and there are no specific age or seasonal differences in the rate of infection.

Kim(1969) made a survey in Quelpart island, and found that the prevalence of *E. histolyica* among the residents was 24.4 per cent. The rate is similar to the results reported by Cho et al.(1967) and Kim et al. (1971).

Subsequent studies have documented the prevalence of intestinal amebas among home and institute children(Chung et al., 1963., and Kim, 1971 a and b), among families(Kuwahara, 1932; and Chyu et al., 1965), patients admitted to University Hospital(Choi et al., 1971; Song, 1977; and Lee, 1979) and rural residents in Chunpook Province (Min, 1972).

These results indicate the predominance of infection with *E. histolyica* in clinical cases compared with the asymptomatic general population.

Summary

From March, 1979 to February, 1981, the patients of Kyungpook National University Hospital had persistent diarrhea and symptoms ascribed to be chronic intestinal amebiasis were examined for intestinal amebas.

In order to determine the species of amebas, the iron-hematoxylin stained preparation was examined, and results in the present study were compared with the data reported by Lee (1979).

A total of 2,083 patients were examined. Of these, the demonstration rate for *Entameba histolytica* was 54.6 per cent and the rate for *Entameba coli* was 8.4 per cent. The rates of *Endolimax nana* and *Iodameba bütschlii* were 1.2 and 0.8 per cent, respectively.

There was no significant difference in the rate of *E. histolytica* between males and females. In the age specific rate, it was the highest in the 20—29 age group, and the lowest in the 0—9 age group. And the rate was high in August and low in October.

It was found that the demonstration rate for intestinal amebas in 1981 was high compared with the results obtained in 1979 by Lee.

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