

The Role of *Dientamoeba fragilis* in Children with Gastrointestinal Illness

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ABSTRACT:**BACKGROUND:**

Dientamoeba fragilis is an intestinal protozoa whose pathogenic characteristics are increasingly recognized.

AIM OF THE STUDY:

The aim of this study is to specify the clinical, biological and epidemiological aspects of *D.fragilis* among children with gastrointestinal illness.

METHODS:

This study was conducted on 171 children attending Child Welfare Teaching Hospital for Pediatrics over a period of 8 months. Stool samples of each child were processed for direct wet smear, modified acid fast and Giemsa staining procedures.

RESULTS:

D. fragilis was observed in 41 (23.4%) case, 39(31.2%) among patients group and 1(2.2%) among control group. This parasite was predominant 15(28.5%) among age group (1-3) years. *D. fragilis* was associated with other intestinal parasites particularly *Blastocystis hominis* 8(20.5%), *Entamoeba histolytica* 5(12.8%), *Enterobius vermicularis* 3(7.7%) and *Giardia lamblia* 2(5.1%). Clinical signs included abdominal pain 31(79.4%), diarrhea 20(51.3%), anorexia 4(35.9%), fever 11(28.2%) and alternating of diarrhea and constipation 10(25.6%).

DISCUSSION:

D.fragilis is today classified in the group of flagellates and I share the opinion of the majority of the authors as to its real pathogenic capacity.

KEYWORDS: *Dientamoeba fragilis* , Gastrointestinal illness.

INTRODUCTION:

Dientamoeba fragilis is one of the small parasites that can live in large intestine of humans. It was generally considered to be a non pathogenic amoeba, but today it is classified in the group of flagellates and there is increasing evidence that infection with this species is often associated with clinical symptoms which do not disappear until the infection is eliminated⁽¹⁾. The presence of various clinical symptoms in many patients infected with *D.fragilis* had pointed to the possible pathogenic role and this was confirmed in two recent papers^(2,3). Grendon and Digiacomo⁽⁴⁾ suggested that treatment can be considered for patients with prolonged symptoms, provided no other causative agents has been found. *D.fragilis* is probably undervalued overall, because its identification relies on permanent stains directly on fresh fecal specimens (Giemsa) or preserved in Polyvinyl Alcohol or Sodium acetic acid formalin (Trichrom or Iron-hematoxylin)^(5,6,7).

PATIENTS AND METHODS:

The study samples included (171) children, attending child welfare Teaching Hospital for Pediatrics. Their age was ranging between one month to 12 years. The period of study extend from March to November 2001.

The children divided into two groups, the patients group include (125) children suffering from gastrointestinal illness and the control group include (46) children free from any signs and symptoms of gastroenteritis.

A single fresh stool specimen was collected from each child.

Each specimen was examined directly by wet smear preparation using saline and Lugol's iodine solutions to look for other intestinal parasites and processed for permanent staining methods which include modified acid-fast stain to look for *Cryptosporidium* and Giemsa stain to look for typical binucleated trophozoite

RESULTS:

Table (1) shows the incidence of intestinal parasites according to positive direct wet smear and indirect staining methods in stool specimens of patients and control groups. The most prevalent protozoan parasite in patients and control groups was *Giardia lamblia* (55.2% and 6.5%) respectively. Otherwise *Enterobius vermicularis* was the most prevalent helminthic parasite in patients and control groups (4% and 2.2%) respectively. *D. fragilis* was found in (31.2% and 2.2%) of patients and control groups respectively. *D. fragilis* was more

frequent (38.5%) in age group (1-3 years) and less (10.3%) in age group (<1 year), table (2). It has been found that 18(46.1%) of positive *D. fragilis* cases associated with other intestinal parasites in particular *E. histolytica* (12.8%), *G. lamblia* (5.1%), *B. hominis* (20.5%) and *E. vermicularis* (7.7%), table (3).

Clinical findings among (39) child infected with *D. fragilis* were analyzed.

Abdominal pain has been found in the highest incidence (79.4%) and constipation was the lowest (10.3%) table (4).

Table 1: Frequency of intestinal parasites in the stool specimens of patients and control groups.

Parasites	Patients group		Control group	
	No. + ve	%	No. + ve	%
<i>Giardia lamblia</i>	69	55.2	3	6.5
<i>Entamoeba histolytica</i>	51	40.8	1	2.2
<i>Dientamoeba fragilis</i>	39	31.2	1	2.2
<i>Cryptosporidium parvum</i>	27	21.6	1	2.2
<i>Entamoeba coli</i>	44	35.2	2	4.3
<i>Trichomonas hominis</i>	13	10.4	0	0
<i>Chilomastix mesnili</i>	9	7.2	0	0
<i>Blastocystis hominis</i>	45	36.0	0	0
<i>Enterobius vermicularis</i>	5	4.0	1	2.2
<i>Hymenolepis nana</i>	2	1.6	0	0
<i>Ascaris lumbricoides</i>	1	0.8	0	0

Table 2: Distribution of *Dientamoeba fragilis* according to age of patients and control groups.

Age group (year)	Patients group	Control group
	No. + (%)	No. + ve (%)
< 1 year	4 (10.3)	0 (0)
1 – 3	15 (38.5)	1 (2.2)
4 – 6	8 (20.5)	0 (0)
7 – 9	7 (17.9)	0 (0)
10 – 12	5 (12.8)	0 (0)

Table 3: Coincidence of *D. fragilis* and other intestinal parasites in 39 children with positive *D. fragilis*.

Mixed infection	No. + (%)
<i>D. fragilis</i> + <i>E. histolytica</i>	5 (12.8)
<i>D. fragilis</i> + <i>G. lamblia</i>	2 (5.1)
<i>D. fragilis</i> + <i>B. hominis</i>	8 (20.5)
<i>D. fragilis</i> + <i>E. vermicularis</i>	3 (7.7)
Total	18 (46.1)

Table 4: Frequency of clinical manifestations in 39 patients with positive *D. fragilis*.

Clinical manifestations	No. + ve	%
Abdominal pain	31	79.4
Diarrhea	20	51.3
Fever	11	28.2
Anorexia	14	35.9
Constipation	4	10.4
Alternating of diarrhea and constipation	10	25.6
vomiting	5	12.8

DISCUSSION:

Unlike most intestinal protozoa *D. fragilis* has no cyst stage in its life cycle and so infection between humans occurs with the trophozoite stage. The organisms are most actively in fresh feces but they quickly round up when standing and will die and dissociated when placed in saline, tap water and distilled water⁽⁸⁾.

In this study *D. fragilis* was found in 39(31.2%) stool specimens out of 125 specimens of children suffering from gastrointestinal illness using wet smear and Giemsa stain.

In other study⁽⁹⁾, it has been found that the incidence of *D. fragilis* was (13.3%) using wet smear preparation only, so staining method will increase the sensitivity of detection of this trophozoite. Other study⁽¹⁰⁾ has been found that permanent stain of all stools, as compared to loose and watery stools only, resulted in a fivefold greater detection of *D. fragilis*.

Giardia lamblia was found to be the most often intestinal parasite (55.2%) as emphasized by other workers^(11,12). *D. fragilis* found to be associated with other intestinal parasites in 18(46.1%) of infected children. Yang⁽¹³⁾ found that (60%) of *D. fragilis* was not associated with other pathogens but the coincidence of *D. fragilis* and *Enterobius vermicularis* infection was 50%,

using scotch tape slide technique while Sawangiaroen found that (65%) was associated with other pathogens⁽¹⁴⁾.

These results indicate that the possible transmission role of *D. fragilis* by eggs of *E. vermicularis*, although the possibility of direct fecal-oral spread is not impossible.

D. fragilis occurred more frequently (39.2%) in age group 1-3 years and this period considered as a period of unhygienic habit.

Other study⁽¹³⁾ has been found to be more frequent in children 11-15 years.

Abdominal pain (79.5%) and diarrhea (51.3%) was found to be the most common symptoms in children infected with *D. fragilis* and these results were in agreement with other study⁽⁹⁾. These results underline the pathogenic role of *D. fragilis* in children with gastrointestinal symptoms if no other pathogenic causative agent has been found and I share the opinion of the majority of the authors as to its real pathogenic capacity.

Otherwise the finding suggested that this parasite is common in our country and all stools should be permanently stained in addition to direct wet smear examination to increase the probability of *D. fragilis* identification.

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