INTESTINAL PARASITES IN PATIENTS WITH CHRONIC ABDOMINAL PAIN

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Abstract

Information about intestinal parasites in Sohag (Upper Egypt) in patients with chronic abdominal pain is scarce. This study determined the intestinal parasites symptoms in 130 patients with chronic abdominal pain and cross-matched 20 healthy persons. Parasitic infection was confirmed by stool analysis. The most commonest clinical data with stool analysis was as following: 1- Entamoeba histolytica associated with nausea 20 (37.74%) followed by anorexia 19 (35.85%), 2- Entamoeba coli associated with diarhoea 3 (100%) followed by nausea 2 (66.67%) and vomiting 2 (66.67%), 3- Enterobius vermicularis associated with nausea 2 (66.67%), diarhoea 2 (66.67%) followed by flatulence 1 (33.33%), 4- Giardia lamblia associated with anorexia 3 (42.86%), vomiting 3 (42.86%) followed by diarhoea 2 (28.57%), 6- Hymenolepis nana associated with anorexia 10 (40.00%) followed by flatulence 9 (36.00%), 7- Taenia saginata associated with dyspepsia 3 (60.00%) followed by flatulence 2 (40.00%), and 8- Ancylostoma duodenal associated with anorexia 2 (66.67%) and diarhoea 2 (66.67%).

Key words: Upper Egypt, Chronic abdominal pain, parasitic infections.

Introduction

Chronic or recurrent abdominal pain is the commonest gastroenterological complaint the physician is confronted with in his outpatient clinic (Bhaskar and Sumathi, 2011). Parasitic diseases are highly endemic but patchily distributed among the 20 countries and almost 400 million people of the Middle East and North Africa (MENA) region (Hotez et al, 2012). Intestinal parasitic infections are among the most common infections in the world and are responsible for considerable morbidity and mortality (Kongs et al, 2001). The epidemiology of intestinal parasitic infections shows that these parasites are found in every age group and in both sexes. However, the incidence is high in some areas and in some age groups. Human intestinal parasitic infections have a worldwide distribution, with the greatest incidence and intensity occurring in developing countries (Naish et al, 2004). Intestinal symptoms with parasitic infections are frequent and include abdominal pain and acute or chronic diarrhea and/or constipation, but systemic manifestations (fatigue, anemia, weight loss, rash, etc) are by no means uncommon. Most intestinal parasites are transmitted by the fecal-oral route as a result of the ingestion of water, vegetables, and/or soil contaminated with ova, cysts or oocysts; in other cases (i.e. Ancylostoma duodenale) transmission occurs via the skin through direct penetration by larvae living in the soil (Masucci et al, 2011). The common intestinal parasites that may give rise to chronic digestive disorders as persistent diarhoea, chronic abdominal pain and/or blood in the stool are protozoa as Blastocystis hominis, Cryptosporidium spp., Cyclospora cayetanensis, Entamoeba histolytica, Giardia intestinalis (syn.: G. lamblia and G. duodenalis), Dientamoeba fragilis, Isospora belli, and Balantidium coli or helminthes as Ascaris lumbricoides, Hymenolepis nana, Capillaria philippinensis, Diphyllolothrium spp., hookworm (Ancylostoma duodenale and Necator americanus), Taenia spp., Trichuristirchiura, intestinal flukes (Becker et al, 2013). The three main techniques for the diagnosis of human intestinal protozoan infections include (i) light microscopy; (ii) antigen detection (EIAs); and (iii) PCR assays. Since the first description of parasitic intestinal protozoa in human stools, documented by the Dutch microscopist Antony van Leeuwen-
hoek in 1681 (Dobell, 1920), microscopic detection of protozoan cysts and trophozoites has been the most widely used diagnostic approach. Identification of helminthes eggs on microscopic stool examination is the reference test for most intestinal helminthes species. In hospitals and microbiological laboratories, stool examination after prior concentration (e.g. by formalin-ether concentration technique) is most commonly employed, while the Kato-Katz thick smear technique is widely used in epidemiological studies and anti-helminthes drug efficacy evaluations in endemic regions (Booth et al., 2003; Speich et al., 2010).

The present study aimed to define the correlation between parasitosis and chronic abdominal pain in Upper Egyptian patients.

**Patients, Materials and Methods**

Cross-sectional study included patients (12-90 years old) with chronic abdominal pain with or without other GIT symptoms as nausea, vomiting, dyspepsia, diarrhea, constipation and/or flatulence. Besides, cross-matched twenty healthy adults were recruited as controls. All participants were informed by the study and signed a written consent then.

All patients and controls were subjected to: A- Full clinical examination (General: looking for signs of anemia and/or malabsorption and clinical examinations of chest, heart and abdomen. B- Laboratory investigations (Aseptic venous blood samples for CBC and liver, and kidney function tests). Patient was considered anemic if hemoglobin values <13.5 g/dl in males and <12 g/dl in females and eosinophilia was diagnosed if counted >0.4x10^9/L.

Stool examination: morning fresh samples were collected and examined by: a- Direct smears stained with Giemsa stain as well as modified Ziehl-Neelsen stain when indicated to detect Cryptosporidium. B- Concentration methods (El Naggar et al., 2006). Abdominal ultrasonography was performed to exclude organic or local cause of chronic abdominal pain. Examination of liver concentrated on size, surface, echo-pattern, any focal lesion and portal and hepatic veins diameters. Examination of spleen concentrated on size, diameter, splenic vein diameter, and any collateral abnormality. Examination of kidneys and urinary bladder concentrated on any abnormality; also, scanning of the gall bladder and biliary channels for any obstruction, ascites was reported.

**Results**

Patients were categorized into 2 groups: 1st group (G1) included 130 patients with chronic abdominal pain and the 2nd group (G2) included 20 healthy volunteers to serve as controls. Stool analysis in G1; 99 patients (76.15%) had positive findings. These were Entamoeba histolytica cyst in 53 (40.77%), Hymenolepis nana egg in 25(19.23%) followed by Giardia lamblia cyst in 7(5.38%). In G2; 12 (60%) had positive findings. These were E. histolytica in 9 (45%) followed by G. lamblia cyst in 3 (15%).

Clinical data: In G1, the commonest associated symptoms were anorexia48 (36.92%), flatulence 41 (31.54%) followed by diarrhea 40 (30.77%). Among 99 patients with positive stool analysis, the commonest symptoms were anorexia in 35 (35.35%), nausea in 33 (33.33%) followed by flatulence in 30 (30.3%) and diarrhea in 30 (30.3%). The eosinophilia was significantly higher in G1 with positive stool analysis for parasites, but without significant difference between the groups as regard presence of anemia. Among the G1, the commonest findings associated with anemia were G. lamblia in 6 (60%) and E. histolytica in 25 (40.32%), and the commonest findings associated with eosinophilia were Entamoeba coli in 3 (100%) and Taenia saginata in 5 (100%) followed by Enterobius vermicularis in 2 (66.67%) and Ancylostoma duodenale in 2 (66.67%).

Abdominal ultrasonography showed normal except for 23 cases; liver was mildly to moderately enlarge with bright mildly to echo pattern (fatty liver).

All details are given in tables (1 & 2) and figures (1, 2, 3, 4, 5 & 6).
Table 1: Distribution of symptoms in G1.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Cases (n=130)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anorexia</td>
<td>48 (36.92%)</td>
</tr>
<tr>
<td>Flatulence</td>
<td>41 (31.54%)</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>40 (30.77%)</td>
</tr>
<tr>
<td>Nausea</td>
<td>38 (29.23%)</td>
</tr>
<tr>
<td>Vomiting</td>
<td>38 (29.23%)</td>
</tr>
<tr>
<td>Dyspepsia</td>
<td>32 (24.62%)</td>
</tr>
<tr>
<td>Constipation</td>
<td>28 (21.54%)</td>
</tr>
<tr>
<td>Malaise</td>
<td>1 (0.77%)</td>
</tr>
<tr>
<td>Pallor</td>
<td>21 (14.00%)</td>
</tr>
<tr>
<td>Underweight</td>
<td>18 (12.00%)</td>
</tr>
</tbody>
</table>

Table 2: Distribution of symptoms by type of intestinal parasites in G1.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Negative (n=31)</th>
<th>Positive (n=99)</th>
<th>E. histolytica cyst (n=53)</th>
<th>E. coli (n=53)</th>
<th>Enterobius (n=3)</th>
<th>Giardia cyst (n=7)</th>
<th>H. nana egg (n=25)</th>
<th>Taenia egg (n=5)</th>
<th>Ancylostoma egg (n=3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anorexia</td>
<td>13 (41.94%)</td>
<td>19 (35.35%)</td>
<td>1 (33.33%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>10 (40.0%)</td>
<td>0 (0.0%)</td>
<td>2 (66.67%)</td>
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<tr>
<td>Flatulence</td>
<td>11 (35.48%)</td>
<td>20 (30.30%)</td>
<td>3 (100%)</td>
<td>2 (66.67%)</td>
<td>2 (28.57%)</td>
<td>9 (36.0%)</td>
<td>2 (40.0%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Diarrhea</td>
<td>10 (32.26%)</td>
<td>16 (30.19%)</td>
<td>0 (0.0%)</td>
<td>1 (33.33%)</td>
<td>2 (28.57%)</td>
<td>6 (24.0%)</td>
<td>1 (20.0%)</td>
<td>2 (66.67%)</td>
<td></td>
</tr>
<tr>
<td>Nausea</td>
<td>5 (16.13%)</td>
<td>20 (37.74%)</td>
<td>3 (100%)</td>
<td>2 (66.67%)</td>
<td>2 (28.57%)</td>
<td>6 (24.0%)</td>
<td>0 (0.0%)</td>
<td>1 (33.33%)</td>
<td></td>
</tr>
<tr>
<td>Vomiting</td>
<td>12 (38.71%)</td>
<td>13 (26.26%)</td>
<td>3 (100%)</td>
<td>2 (66.67%)</td>
<td>2 (28.57%)</td>
<td>7 (28.0%)</td>
<td>0 (0.0%)</td>
<td>1 (33.33%)</td>
<td></td>
</tr>
<tr>
<td>Dyspepsia</td>
<td>6 (19.35%)</td>
<td>16 (30.19%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>7 (28.0%)</td>
<td>3 (60.0%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Constipation</td>
<td>7 (22.58%)</td>
<td>12 (22.64%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>1 (14.29%)</td>
<td>8 (32.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Malaise</td>
<td>0 (0.0%)</td>
<td>1 (1.01%)</td>
<td>1 (1.89%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Pallor</td>
<td>5 (16.13%)</td>
<td>16 (16.16%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>2 (28.57%)</td>
<td>6 (24.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.00%)</td>
</tr>
<tr>
<td>Underweight</td>
<td>2 (6.45%)</td>
<td>16 (16.16%)</td>
<td>1 (33.33%)</td>
<td>1 (33.33%)</td>
<td>1 (28.57%)</td>
<td>6 (24.0%)</td>
<td>1 (20.0%)</td>
<td>1 (33.33%)</td>
<td></td>
</tr>
</tbody>
</table>

Fig. 1: Distribution of studied groups according to stool analysis.
Fig. 2: Distribution of intestinal parasites in groups.

![Fig. 2: Distribution of intestinal parasites in groups.](image)

Fig. 3: Distribution of anemia in groups according to stool analysis.

![Fig. 3: Distribution of anemia in groups according to stool analysis.](image)

Fig. 4: Distribution of eosinophilia in groups according to stool analysis.

![Fig. 4: Distribution of eosinophilia in groups according to stool analysis.](image)
Discussion

Chronic or recurrent abdominal pain is the commonest gastroenterological complaint the physician is confronted with in his outpatient clinic (Bhaskar and Sumathi, 2011). Intestinal parasitic infections are among the most common infections in the world and are responsible for considerable morbidity and mortality. The intensity of infection is a major determinant of morbidity (Kongs et al, 2001). In the present work, parasitic infection was detected in 74% of the studied
population. This is higher than many studies conducted in Egypt to figure out the epidemiology of parasitic infections as Hassan (1994) when assessed parasitic infections in Giza governorate, reported an overall prevalence of 56.5%. El Masry et al. (2002) found that the prevalence of parasitic infections among children in two low socioeconomic areas in Alexandria; El Madabegh and Tobgeya was 66.7% and 43.8% respectively. Also, Crompton (1999) and El Badawy et al. (2001) stated that the prevalence of parasitic infections were widely varied from place to place, time to time and person to person even in endemic areas according to two main factors; the intensity of exposure to the parasites on one hand and the combating control measures on the other. Both these factors interact together to bring out the incidence and prevalence of parasitic infections. In the current study the most prevalent pathogenic parasitic infections were Entamoeba histolytica cyst (40.77%), Hymenolepis nana (19.23%), Gardia lamblia (5.38%), Taenia (3.85%), Enterobius vermicularis (2.31%), Anclystoma (2.31%), Entamaeba coli (2.31%) and this agreed with Bakr et al. (2009) in Menoufia Governorate, Egypt. They found that the most prevalent pathogenic parasitic infections were Entamoeba histolytica (20%), Entamoeba coli (10%), Gardia lamblia (10%), Ascaris lumbricoides (7.31%). However, none had Cryptosporidium spp., which might be due to the fact that all patients were from urban areas within Sohag City, capital of Sohag Governorate. Shalaby and Shalaby (2015) in rural area reported a significant relation between cryptosporidiosis, low socio-economic level and animal contact.

Regarding clinical data in stool positive cases, anorexia was reported in (35.35%), nausea in (33.33%), diarrhea in (30.3%), flatulence in (30.3%), vomiting in (26.26%), dyspepsia in (26.26%), constipation in (21.21%), pallor in (16.16%), underweight in (16.16%) and malaise in (1.01%). These figures are higher than in stool negative cases of chronic abdominal pain. Intestinal invasion may be asymptomatic (small number) or presented by various symptoms as abdominal pain (usually vague), abdominal cramps/colic, diarrhea, rarely vomiting and occasionally constipation (Hökelek and Lutwick, 2006). Most of the parasitic infections cause acute or chronic diarrhea with malabsorption (Mahmoud, 1983; Alberton et al., 1995). The most frequent associated symptoms were diarrhea and distension (Mahmoud, 1983; Current and Garcia, 1991). However, chronic symptoms such as dyspepsia, epigastric pain, nausea and anorexia may be present (Addis et al., 1992; Fayad et al., 1992). El-Hawy et al. (1992) and Markel et al. (1999) cleared that, through effect on the intestinal flora, children infected with enteric parasites may suffer from colitis that lead to vague, non-specific abdominal symptoms. So, they usually lose their food interest to prevent these symptoms. Entamoeba histolytica may be asymptomatic or may cause dysentery or extra intestinal disease. Patients with amebic colitis typically present with a several-week history of cramping abdominal pain, weight loss, and watery or bloody diarrhea. The insidious onset and variable signs and symptoms, with fever and grossly bloody stool are absent in most cases (Aristizabal et al., 1991). In our study, the most common symptoms associated with Entamoeba histolytica were nausea (37.74%), anorexia (35.85%), flatulence (30.19%), dyspepsia (30.19%) and diarrhea (26.42%). Intestinal invasion by Entobius vermicularis may be asymptomatic (small number) or presented by various symptoms as vague abdominal pain, abdominal colic, diarrhea, vomiting and constipation. However, the most common symptom in pin worm infection is nocturnal perianal pruritus (Hökelek and Lutwick, 2006). In our study, the most common symptoms associated with Entobius vermicularis were nausea (66.67%), diarrhea (66.67%) and flatulence (33.33%). Giardia Lamblia generally causes a self-limited ill-
ness characterized by diarrhea, abdominal cramps, bloating, weight loss, and malabsorption. However, asymptomatic infections are frequent, especially in developing countries (Thompson, 2000). In the present study, the most common symptoms were anorexia (42.86%), vomiting (42.86%), nausea (28.57%), diarrhea (28.57%) and flatulence (28.57%). The symptoms of H. nana infection in our study included anorexia (40%), flatulence (36%), constipation (32%), vomiting (28%), pallor (24%) and underweight (24%). This agreed with Romero (2007) who reported abdominal pain, meteorism, nausea, vomiting, and diarrhea, loss of appetite (anorexia), itching, irritability, sleeplessness and enuresis. In severe infections, diarrhea is more frequent, associated with malabsorption syndrome which results in weight loss. Mohammad and Hegazi (2007) reported that the presence of H. nana reduced the intestinal absorption of vitamin B12 and folic acid which resulted in the development of anemia. The effects of Ancylostoma duodenale infection include growth delay, especially in children, and anemia (Ndoyomugenyi et al, 2008). In the present study, the most common symptoms were dyspepsia (60.0%), flatulence (40.0%), diarrhea (20.0%) and underweight (20.0%). In the present study reported association between anemia and parasitic infection among the studied population most commonly with Giardia followed by Entamaeba histolytica. Nesheim and Crompton (2002) reported that parasitic infections were usually associated with anemia as a subsequent event, due to either malnutrition e.g. Ascaris or chronic blood loss e.g. ancylostomiasis and schistosomiasis. The present study denoted that cases with eosinophilia were concomitant with parasitic infections commonly with Entamaeba coli and Taenia followed by Entrobius and Ancylostoma. This was confirmed by Silva and Pereira, (2000) who illustrated that 81% of eosinophilia was due to parasitic infections. Parasitic infections of the gut, though are relatively uncommon in the United Kingdom, should always be considered when eosinophils are a conspicuous feature of an inflammatory reaction. Parasites, which are sometimes associated with dense eosinophilia in the lamina propria of the jejunum, are Giardia lamblia and hookworms. Hookworms are most often indicated in sections by erosions or circular channels where the worm was lying in the densest aggregates of eosinophils in these sections (Morson and Dawson, 1979).

**Conclusion**

It is known that infections caused by gastro-intestinal parasites affect over 3.5 million people worldwide. The outcome data showed intestinal parasitic infections in both cross-matched healthy subjects and patients with chronic abdominal pain and that there was marked associated symptoms with gastro-intestinal parasites.

No doubt, proper diagnosis and specific treatment of the gastro-intestinal infected patients is a must.

**References**


Booth, M, Vounatsou, P, N’Goran, EK, Tanner, M, Utzinger, J, 2003: The influence of sampling effort and the performance of the


