PREVALENCE OF COMMON INTESTINAL PARASITES IN ADULT PATIENTS WITH CHRONIC LIVER DISEASES ASSOCIATED WITH HELICOBACTER PYLORI INFECTION

By

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Abstract

The present study investigated the prevalence of common intestinal parasites in association with H. pylori infection among a group of patients with the most common chronic disease prevalent in Egypt. These patients were known to be chronic liver disease with different etiology and followed up in gastroenterology out-patients clinic. They were 77 complaining of various abdominal symptoms either some or all symptoms such as; nausea, vomiting, abdominal pain, heart burn, flatulence, constipation, distension, melena and sometimes diarrhea. The diagnosis of chronic liver disease was confirmed by the history, clinical examination, laboratory investigations, and sonographic images. There were 37 males and 40 females with mean age (48.5±14.2). Types of liver diseases were liver cirrhosis in 28 patients and fatty liver in 49 patients (Non Alcoholic Fatty liver disease; NAFLD). None of the patients was diabetic. Afresh single fecal sample was collected from both patients and controls. Each sample was divided into two parts; one for examination of common intestinal parasites, and the other part for detection of H. pylori antigen by Copro-immunoassay. The results showed no significant difference among intestinal parasites in patients and controls. But, E. histolytic was the commonest parasite (48%) compared to; G. lamblia (4%), A. lumbricoides (5.3%), E. vermicularis (2.7%), S. mansoni (1.3%), 2/3 of patients with E. histolytica were co-infected with H. pylori infection. The prevalence of H. pylori infection was (81.8%) compared to controls (63%), with significant difference.

Key words: Chronic liver diseases, Entamoeba histolytica, Giardia lamblia, Ascaris lumbricoides, Enterobius vermicularis, Schistosoma mansoni, Helicobacter pylori.

Introduction

In a systemic review and meta-analysis to assess the prevalence of Helicobacter pylori infection, more than half the world's population was infected (Hou et al, 2017). H. pylori is an important cause of peptic ulcer disease and gastric cancer. H. pylori may also have a role in uninvestigated and functional dyspepsia, ulcer risk in patients taking low-dose aspirin or starting therapy with a non-steroidal anti-inflammatory medication, unexplained iron deficiency anemia and idiopathic thrombocytopenic purpura (Chey et al, 2017).

In Egypt, Sabah and Temsah (2015) investigated the prevalence of some intestinal parasites in diabetic patients in association with Helicobacter pylori infection (H. pylori). They showed that Entamoeba histolytica (E. histolytica) was the commonest parasite prevalent compared to other parasites. But, there was no statistical difference from controls. On the other hand, there was statistical difference between patient and controls regarding H. pylori infection. Intestinal parasites usually create benign diseases, though they may induce complications with high morbidity and mortality to the immunocompromised patients. Also, E. histolytica modulated the virulence of certain human viruses and itself a host for its own viruses. For example, AIDS accentuates the damage and pathogenicity of E. histolytica (Hung et al, 2005). Infective HIV was viable within the amoeba (Brown et al, 1991). In children, Hegab et al. (2003) in Egypt found that the incidence of opportunistic intestinal parasites with chronic liver disease was (92.5%) compared to the immuno-compromised children (90%); the commonest parasites were G. lamblia, E. histolytica and Cryptosporidium parvum. Also, Baiomy et al. (2010) in
Egypt investigated the opportunistic parasitic infections among the immunocompromised children with malignancy, diabetic, and chronic renal failure and *Giardia lamblia* was the most common parasite. El-Shazly *et al.* (2015) reported that liver diseases affected the immunity of the patients and were often highly susceptible to parasitic infection. Most of the previous studies were conducted on children with chronic diseases including liver diseases.

The aim of this study was to investigate the prevalence of common intestinal parasites and *Helicobacter pylori* co-infection among adult patients with chronic liver diseases.

**Subjects and Methods**

A total number of 77 patients were known to suffer from chronic liver diseases. They were 37 males and 40 females with mean age of (48.5±14.2). 28 patients out of 77 were having liver cirrhosis with various degrees the remainders 49 patients were suffering from non-alcoholic fatty liver diseases but there were not known diabetic. All patients were attending out-patient clinic complaining of different gastrointestinal symptoms. All patients were subjected to clinical, biochemical and ultrasonographic investigations. They all were approved to share in accordance with the ethical standards. The controls were cross-matched individuals suffered from various gastrointestinal symptoms. A single fresh fecal sample was collected from all participants, and examined through two hours. Each sample was divided into two parts: one prepared for examination of common intestinal parasites using the Kato-thick smear method (Katz *et al.*, 1970), simple sedimentation (Garcia, 2001), then stained by iodine and microscopic examined. In patients with diarrhea, the stool sample was stained by modified Ziehl-Nelsen (MZN) for the suspected *Cryptosporidium parvum* (El Naggar *et al.*, 2006). The other part of the sample was prepared for the qualitative detection of *H. pylori* antigen using chromatographic immunoassay (On Site *H. pylori* Ag Rapid Test) with the sensitivity 94.4%, and specificity 100%, with an overall predictive value of 97.8%. Preparation of the test was done according to the company’s instructions (CTK Biotech. Inc. 10110 Misa Rim Road. San Diago, CA 92121, USA). The test detected antigen present in feces, which indicated an active *H. pylori* infection. The interpretation of the test was according to the rules given by the company as follow:

![Test Interpretation Diagram]

Where C= control, T= tests

**Results**

<table>
<thead>
<tr>
<th>Item</th>
<th><em>E. histolytica</em></th>
<th><em>G. lamblia</em></th>
<th><em>A. lumbricoides</em></th>
<th><em>E. vermicularis</em></th>
<th><em>H. pylori</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total No. 77</td>
<td>37/77</td>
<td>3/77</td>
<td>4/77</td>
<td>3/77</td>
<td>63/77</td>
</tr>
<tr>
<td>%</td>
<td>48%</td>
<td>4%</td>
<td>5.2%</td>
<td>3.9%</td>
<td>81.8%</td>
</tr>
<tr>
<td>Controls</td>
<td>48%</td>
<td>3.3%</td>
<td>5.3%</td>
<td>4%</td>
<td>63%</td>
</tr>
</tbody>
</table>

*E. histolytica* was the commonest parasite compared to others. But difference was not significant compared to controls in all parasites. For *H. pylori* infection, the prevalence of infection was significantly high compared to controls (81.8% & 63% respectively). Almost one third of patients suffered from *E. histolytica* and *H. pylori* co-infection.
Discussion

Intestinal parasites usually create benign diseases in immuno-competent hosts. But, hosts with abnormal or compromised responses are at high risk for severe disease manifestations, such as the reactivation of subclinical leishmaniasis infection with development of advanced visceral leishmaniasis in human immunodeficiency virus infected patients (Schiff, 2003). Moreover, they may induce complications with high risk of morbidity and mortality (El-Nady et al., 2015). In an experimental study, Cislagk et al. (1992) used the severe combined immuno-deficient mice to evaluate resistance to invasive with E. histolytica. They found that all the mice developed severe liver abscesses when challenged intra-hepatic with virulent strain of E. histolytica. Several studies have demonstrated the incidence of intestinal parasites among immunocompromised children including those with chronic liver diseases (Hegab et al., 2003; Hung et al., 2005; Antonios et al., 2010; Bayoumy et al., 2010; El-Shazly et al., 2015).

H. pylori, is a gram-negative, microaerophilic bacterium found usually in the stomach. It is present in a person with chronic gastritis and gastric ulcers (Marshall and Warren, 1984; Graham and Graham 1999). It is also linked to the development of duodenal ulcers and stomach cancer. More than 50% of the world’s population harbor H. pylori in their upper gastratstinal tract (Aieva et al, 2016). The present study investigated the prevalence of common intestinal parasites in patients suffered from chronic liver diseases with different etiology in association with H. pylori infection. Ultrasound of the liver has a high sensitivity and specificity (both approaching 90%) for detection of fatty infiltration but does not allow assessment for the presence or degree of inflammation and fibrosis (Mauss et al., 2014). Ultrasonography proved to be quick, widely available and inexpensive modality for hepatic imaging and is often the initial imaging test ordered (Ahmed et al, 2007).

On the other hand, there was no yet proven causal association between H. pylori infection and gastro-oesophageal reflux disease. On the geographical basis, there is a negative association between the prevalence of H. pylori infection and the prevalence and severity of gastro-oesophageal reflux disease (Hong and Kim, 2015).

In systemic review several studies investigated prevalence of intestinal parasite in association with H. pylori infection in children (Torres et al., 2003; Bin Mohanna et al., 2014). These studies have done in healthy subjects. None studies investigated the relationship of H. pylori infections and common intestinal parasitosis in chronic diseases such as diabetes, chronic liver diseases, and other types of chronic diseases. Therefore we assume that current studies would be the first studies performed in Egypt regarding this issue. In previous study Sabah and Tem-dah (2015) studied diabetic patients and prevalence of common intestinal parasites, in a descending order: E. histolytica (48%), G. lamblia (4.8%), E. vermicularis (4.8%), A. lumbricoides (2.5%), & S. mansoni (2.5%). The difference compared to controls was not statistically significant. In contrast the prevalence of H. pylori was (88.6), significantly higher than controls (63%). The current results showed that E. histolytica was the commonest parasites compared to other parasites (48%). Moreover, H. pylori (81.8%) in patients were significantly higher (63%) than in controls.

The present study did not agree with Baimy et al. (2010) who reported that G. lamblia was the commonest parasite in patients with immunocompromised diseases (10%) while in the present study the prevalence of G. lamblia was (4%). El Nadi et al. (2015) also contradicted with the present data, as E. histolytica was (48%) and G. lamblia was (4%) while in that study E. histolytica was (7%) & G. lamblia was (22%). The difference between the two results could be attributed to the difference in location, type of patients, the patient’s behavior, culture, med-
ification and environmental factors. Antonios et al. (2010) reported that G. lamblia was (25%) among children with renal failure while in the present study, G. lamblia was (4%). The differences in results might be attributed to the difference of patients ages (children and adults), and type of disease (renal failure and/or chronic liver disease). Al-Qobati et al. (2012) assessed the profile of intestinal parasites among patients with cancer on chemotherapy, found that E. histolytica was (2.4%) and A. lumbricoides was (1.5%) while in the present results were (48%) for E. histolytica and (5.2%) for A. lumbricoides which are contradicted with that study. Hegab et al. (2003) showed that E. histolytica was among the commonest parasites in immunocompromised children that agreed with the present results. Torres et al. (2003) reported that adults with intestinal parasitic infection had a significantly lower H. pylori prevalence than adults without parasites. Bin-Mohanna et al. (2014) found that amoebiasis and giardiasis were less prevalent than H. pylori infection in children. This result agreed with the present results but in adults with chronic liver disease, was expected that the reverse was true in the context that chronic liver disease as an immunocompromised state.

Conclusion

Helicobacter pylori infection is a common worldwide infection that is an important cause of peptic ulcer disease and gastric cancer.

The common intestinal parasitosis and H. pylori co-infection was clarified. Such a study should be set-up to investigate the epidemiological and clinical impact of co-infection especially in the chronic diseases. Now, is there any synergistic relation between E. histolytica and H. pylori infection in immuno-compromised patients? Could H. pylori infection be considered as an opportunistic infection? No doubt, E. histolytica still the commonest parasite in adult patients with chronic liver diseases but without significant difference. In contrast H. pylori was highly significant than in controls. Also, there was no particular relationship between H. pylori infection and other common intestinal infections.

Recommendations

More sensitive and reliable methods to diagnose E. histolytica other than direct examination should be used in H. pylori infected patients
1- What is the role of immune system in fighting against bacterial infection in association with parasitic infection?
2- Host parasite relationship association with H. pylori and other gastrointestinal infections must be clarified.
3- Prompt treatment of both parasite infection and H. pylori especially in immunocompromized patients is a must.

Conflict of interest: the authors declared that they neither had any potential interest nor received financial support.

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