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Original Article

Giardia intestinalis in patients with nonulcer dyspepsia

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ABSTRACT

Background and study aims: Giardiasis may present with dyspeptic symptoms that may mimic other gastrointestinal and/or biliary disorders. The objective of this study was to determine the prevalence of giardiasis in stool and duodenal aspirate of patients with NUD, assess symptomatic benefit of therapy, and compare the diagnostic tools for giardiasis utilizing stool and duodenal aspirates microscopic evaluation versus ELISA testing.

Patients and methods: 109 Patients with endoscopic diagnosis of NUD out of 278 consecutive patients with dyspepsia were included. The severity of dyspepsia and the quality of life were assessed utilizing Rome II criteria and SF-36 for Quality of Life and concomitant stool and/or duodenal aspirate samples were submitted for ELISA antigen test for *Giardia intestinalis*. Those who tested positive for giardiasis (Group 1) were assigned to receive Tinidazole 2.0 g. single dose plus omeprazole for 4 weeks and the remaining patients (Group 2) omeprazole alone for 4 weeks. One month after therapy, both groups were reassessed and Stool ELISA antigen test for *G. intestinalis* for Group 1, was performed.

Results: ELISA testing of stool (19%) and duodenal aspirates (19%) had significantly better results than microscopic ones in stool (11%) or duodenal aspirates (7%). The two groups were well matched with respect to age, sex, initial results on the Glasgow Dyspepsia Severity Score, prevalence of previously prescribed antisecretory-drug therapy, prevalence of smoking, predominant symptom at presentation, and quality of life. The outcome of patients at 1 month, on an intention-to-treat basis, showed that the symptoms were resolved (defined as a score of 0 or 1) in 17 of 21 patients (81%) in Group 1 as compared with 31 of 88 patients (35%) in Group 2 $P < 0.001$. The scores in both groups were lower than those at base line and there was a highly statistically significant difference between both groups.

Conclusion: G. intestinalis as a cause of dyspepsia should be considered in patients with negative endoscopy and in those who remain symptomatic in spite of adequate treatment for known upper G.I. disorders. NUD associated with the presence of Giardia, had better symptomatic benefit (81%) with specific treatment than controls (35%). ELISA testing of stool (19%) and duodenal aspirates (19%) had significantly better results than microscopic ones in stool (11%) or duodenal aspirates (7%).

Introduction

Dyspepsia is defined as intermittent or persistent pain or discomfort in the upper abdomen or lower part of the chest, heartburn, nausea, a feeling of postprandial fullness, or any other symptoms thought to be related to the upper gastrointestinal tract [1]. Dyspepsia affects 20–40% of the Western world [2] dyspepsia is considered to be functional, or idiopathic, in as many as 60% of patients [3,4]. The Rome II criteria provide an updated definition of nonulcer dyspepsia [5]. The cause of nonulcer dyspepsia is unclear but is thought to be heterogeneous [6,7]. The management of the disorder is unsatisfactory [7]. Giardiasis is a major intestinal protozoan caused by the flagellate protozoan *Giardia intestinalis* (previously known as *Giardia lamblia*), and is the most commonly identified intestinal parasite in the United States and the most common protozoal intestinal parasite isolated worldwide [8–10]. Giardiasis is a water-borne disease transmitted through ingestion of infectious *G. intestinalis* cysts, [11] diarrhoea is the most common symptom of acute Giardia infection, occurring in 90% of symptomatic subjects [12] while chronic infection may present with dyspeptic symptoms that may be confused with other gastrointestinal and/or biliary disorders [13,14]. Previous studies have suggested that *G. intestinalis* may cause nonulcer dyspepsia as the sole manifestation of infection [15]. Immunodiagnostic assays are

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available for the detection of Giardia as stool or duodenal aspirate ELISA antigen test, which is 98.4% sensitive and 100% specific; the positive and negative predictive value was 98.7% [16].

The objective of this study was to determine the prevalence of giardiasis in stool and duodenal aspirate of patients with NUD, assess symptomatic benefit of therapy, and compare the diagnostic tools for giardiasis utilizing stool and/or duodenal aspirates microscopic evaluation versus ELISA testing.

Patients and methods

Recruitment of patients

We selected patients for the present study from those with dyspepsia who were referred to the gastroenterology clinic at King Fahad Hospital, Al-Madinah Almounawarha, Saudi Arabia, from September, 2009 to June, 2010, according to Rome II Diagnostic Criteria for Non Ulcer (Functional) Dyspepsia [4].

Patients who met the following criteria for at least 12 weeks within the preceding 12 months:

- Persistent or recurrent symptoms (pain or discomfort centred in the upper abdomen).
- No evidence of organic disease (including an upper gastrointestinal endoscopy) that is likely to explain the symptoms.
- No evidence that dyspepsia is relieved exclusively by defecation or associated with the onset of a change in stool frequency or stool form (i.e., not irritable bowel syndrome).

Adapted with permission from Drossman DA, et al., eds. Rome II: the functional gastrointestinal disorders: diagnosis, pathophysiology, and treatment: a multinational consensus. 2d ed. McLean, Va.: Degnon Associates, 2000.

Patients were excluded if they had previously been found to have peptic ulcer disease, had endoscopic evidence of oesophagitis, other gastrointestinal disease, were taking nonsteroidal anti-inflammatory drugs (other than low-dose aspirin), had undergone gastric resection, were pregnant, or had tested positive or had been treated for H. pylori infection.

Evaluation of patients

The patients were asked to stop taking any antisecretory drug before the initial clinic visit. A standardized interview was used to determine each patient's symptoms and the duration of symptoms (less than 12 months, or more than 12 months), and a physical examination was conducted.

The severity of the dyspepsia during the 6 months preceding the visit was assessed with Glasgow Dyspepsia Severity Score [17]. This scale evaluates the frequency of symptoms (maximal score, 5); the effect of dyspepsia on normal activities (2); the number of days of work missed because of dyspepsia (2); and the frequency of medical consultations (2), home visits by a physician (2), tests for dyspepsia (2), use of over-the-counter medications (2), and use of prescribed medications (3). Scores can range from 0 to 20, with higher scores indicating more severe dyspepsia. Quality of life was assessed with a 36-item Medical Outcomes Study Short-Form General Health Survey (SF-36), which examines eight aspects of the quality of life: general and mental health, physical function, social function, physical and emotional health, pain, and vitality. Scores on each of the eight aspects can range from 0 (worst) to 100 (best) [18]. After clinical assessment, microscopic stool analysis was done for all and any positive cases with parasites other than Giardia were excluded from the study. All patients underwent upper gastrointestinal endoscopy and those with endoscopic evidence of current or previous peptic ulcer disease or H. pylori infection were excluded. Concomitant stool and/or duodenal aspirate samples from cases with NUD were submitted for ELISA antigen test for *G. intestinalis*. Patients who tested positive for giardiasis (Group 1) were assigned to receive Tinidazole 2.0 g, single dose (with 92% median efficacy and 86–100% efficacy range) [19] plus omeprazole for 4 weeks, and the remaining patients (Group 2) were assigned to receive omeprazole alone for 4 weeks. One month after therapy, frequency of dyspepsia symptoms, Glasgow Dyspepsia Severity Score, and the quality of life were reassessed for both groups and Stool ELISA antigen test for *G. intestinalis* for Group 1, was performed.

The study was approved by the Taibah University ethics committee, and all patients gave written informed consent.

Statistical analysis

Analyses, using SPSS version 12, were performed with respect to the main study aim. An independent *t*-test was used to compare normally distributed continuous variables. Fisher's exact test was used to analyse dichotomized variables. $P \leqslant 0.05$ was considered statistically significant.

Results

Between September, 2009 and June, 2010, we enrolled 109 patients (66 males, 43 females, age range:18–57 years) with endoscopic diagnosis of NUD out of 278 consecutive patients with dyspepsia attending the gastroenterology outpatient clinic at King Fahad Hospital, Al-Madinah Almounawarha, Saudi Arabia. The reasons for exclusion were endoscopic evidence of duodenal or gastric ulcer or oesophagitis (35 patients), a positive test for H. pylori (56 patients), previous treatment for H. pylori (21 patients), other parasitic infestations found on stool analysis (26 patients), inability to tolerate endoscopy (11 patients), use of nonsteroidal anti-inflammatory drugs (9 patients), and pregnancy or a serious medical condition (21 patients).

ELISA testing of stool (19%) and duodenal aspirates (19%) had significant better results than microscopic ones in stool (11%) or duodenal aspirates (7%) (Table 1).

The two groups were well matched with respect to age, sex, initial results on Glasgow Dyspepsia Severity Score, prevalence of previously prescribed antisecretory-drug therapy, prevalence of smoking, predominant symptom at presentation, and quality of life (Table 2).

There was resolution of symptoms (defined as a score of 0 or 1) in 17 patients (81%) in Group 1 versus 31 of 88 patients (35%) in Group 2 – this difference is statistically significant. The other highly significant difference between the two groups was in Glasgow Dyspepisa severity score and in quality of life score (Table 3).

Discussion

ELISA testing of stool and duodenal aspirate of the 109 patients with NUD was positive for *G. lamblia* in 21 (19.3%) patients. We also, found that faecal ELISA is equivalent to duodenal aspirate ELISA, and both are superior to stool and duodenal aspirate microscopy in diagnosis of giardiasis. Stool or duodenal aspirate ELISA antigen test is 98.4% sensitive and 100% specific with positive and negative predictive value of 98.7% [16]. Accordingly, we relied on faecal ELISA in follow up of group 1 after treatment.

Zafar et al., 1991 found *G. lamblia* trophozoites in 9% of aspirates and 1.8% duodenal biopsies, [20] while Javed Yakoob et al., 2005 found that 44% (96/220) patients were *Giardia* positive [21]. In studies from other areas of Saudi Arabia, the prevalence of *Giardia*