ORIGINAL ARTICLE

ENDOSCOPIC BIOPSY PROVEN CO-INFECTION OF HELICOBACTER PYLORI AND GIARDIA LAMBLIA IN ADULT POPULATION OF KARACHI CITY

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ABSTRACT

Background: Worldwide, the prevalence of pathogenic bacterium Helicobacter pylori (H.pylori) and the protozoan parasite Giardia lamblia (G. lamblia) is well known. It is more common in densely populated area with poor sanitation in developing countries as compared to developed countries. Although the prevalence of these organisms is widely studied in our population but our study is a unique kind in its way where we have determined co-infection of H.pylori and G. lamblia in gastric and duodenal biopsies respectively. To know the prevalence of H. pylori, G. lamblia and their co-infection in endoscopic biopsy specimen received at Dr. Tahir laboratory, Hamdard Medical University, Karachi.

Methods: This prospective study was conducted in the department of Histopathology at Dr. Tahir Laboratory, Hamdard Medical University, Karachi during January 2016 - December 2017. All the consecutive cases of gastric and duodenal biopsies from the same patient received during 2 years were reviewed. The data obtained were subjected to descriptive statistical analysis using SPSS version 22.

Results: A total of 187 gastric and duodenal biopsies (males = 99/52.9%, females = 88/47.0%) (age range = 22 to 71 years) were received through 2 years of duration. Out of 187 cases, H.pylori was found in 120 (64.1%) gastric biopsies, torphozoites of G.lamblia were seen in 42 (22.4%) duodenal biopsies, co-infection of H.pylori and G.lamblia was positive in 15 (8.0%)cases whereas no infection was observed by these organisms in 10 (5.3%) cases.

Conclusion: This study concludes a high prevalence of H. pylori & G. lamblia in our population. Moreover, the study also noted co-infection of these organisms in the study area.

Keywords: H. pylori, G. lamblia, co-infection.

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INTRODUCTION

Worldwide, gastrointestinal diseases are major causes of morbidity and mortality, particularly in low income countries. Co-infections involving different pathogens are commonly seen. Several bacteria, viruses and parasites are the causative agents of these infections. Potential association between H.pylori and G. lamblia has been reported by several studies from different settings.[1-4] However, literature shows negligible reports from Pakistan mentioning co-infection of H. pylori and G. lamblia.

H.pylori is a gram negative bacterium which colonizes the gastric mucosa of its human host. It gives rise to vague symptoms such as dyspepsia, epigastric pain, nausea, vomiting and has been associated with chronic gastritis, peptic ulcers and gastric cancer.[5] Developing countries including Pakistan show markedly high prevalence of H. pylori

infection (70-90%) as compared to developed countries (25-50%).[6-11] Several non invasive and invasive diagnostic tests for H. pylori are implicated. Invasive tests include culture, gram stain & special stain, detection of urease activity and polymerase chain reaction (PCR) using gastric biopsy specimen. While noninvasive methods consist of urea breath tests (UBT), serology and H. pylori stool antigen test (HpsAg).

G. lamblia is one of the most common protozoans isolated from gastrointestinal tract. Clinical manifestations of giardiasis are abdominal pain, diarrhea and dyspepsia. Epidemiological surveys have shown that giardiasis is more common in children with prevalence of 2-5% in developed countries in comparison with high prevalence rate of 20-40% in developing countries including Pakistan.[12,13] Diagnosis of giardiasis is done by investigating different samples that includes stool examination, duodenal aspirate sampling or endoscopic biopsy which are subjected to conventional microscopic methods or highly sensitive and specific methods including Enzyme linked immunoassay (ELISA) or PCR.

In this study we aim to study the prevalence of H. pylori, G. lamblia & their co-infection in adult population at a tertiary care centre of Karachi city.

METHODS

The study was conducted in the department of Histopathology at Dr. Tahir Laboratory, Hamdard Medical University, Karachi during the period of 2016 to 2017. After patients' consent, all the consecutive cases of gastric and duodenal biopsies from the same patient received during this period were included in the study. Demographic variables including name, age and gender were recorded. All the biopsies were routinely grossed, processed and sections were stained with Hematoxylin and eosin (H and E) to highlight the morphology of the tissue. Additionally, to improve the specificity for the diagnosis of H. pylori and G. lamblia, the sections were subjected to special stains such as Periodic Acid Schiff (PAS) & Giemsa. The data obtained was subjected to descriptive statistical analysis using SPSS version 22.

RESULTS

A total of 187 gastric and duodenal biopsies (males = 99/52.9%, females = 88/47.0%) (age range = 22 to 71 years) were received through 2 years of duration. Out of 187 cases, H. pylori was found in 120 (64.1%) gastric biopsies, trophozoites of Giardia lamblia were seen in 42 (22.4%) duodenal biopsies, co infection of H. pylori and G. lamblia was positive in 15 (8.0%) cases whereas no infection was observed by these organisms in 10 (5.3%) cases. (Table 1; Figures 1 and 2)

Table 1: Distribution of H.pylori & G. lamblia co infection.

	H.Pylori +ve	H. Pylori -ve	Total
G.lamblia +ve	15	42	57
G. lamblia -ve	120	10	130
Total	135	52	187

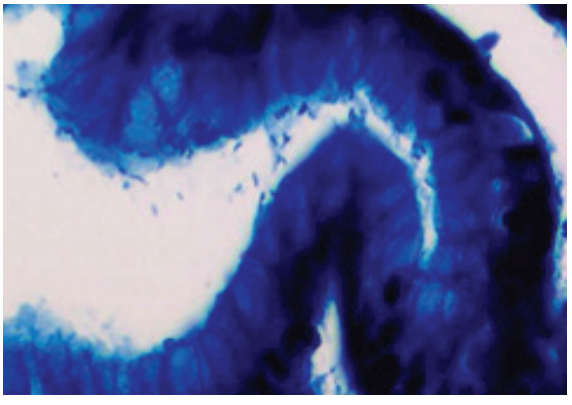

Figure 1: Stomach biopsy 40X (Giemsa stain) highlighting H. pylori organism.

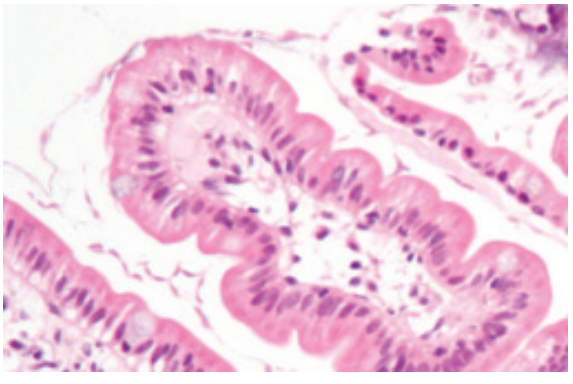

Figure 2: Duodenal biopsy 20X (H&E stain) showing trophozoites of G. lamblia organism.

DISCUSSION

Developing countries are frequently diagnosed with co-infection by several different pathogens. H. pylorus is recognized as the most important causative factor of gastric disorders. G. lamblia is considered as the commonest protozoan infection in humans. Similar mode of transmission of H. pylori and G. lamblia and their strong correlation to socio economic status, explains their probability of co-infection.[14]

The present study showed high prevalence of H. pylori to be 64.1% in gastric biopsies. This is in accordance with other studies in our region and as

well as from other developing countries where high prevalence of H. pylori is recorded.[14-17]We found no significant difference between H. pylori infection and gender whereas significant association was seen with increasing age which is in agreement with another study done in Pakistan.[16]The current study revealed 22.4% prevalence of giardiasis in duodenal biopsies. This result was similar to results obtained by Ahmed et al. and Eltayeb et al. where they detected G. lamblia in stool samples using direct wet mount & formal ether concentration technique (FECT).[18,19] On contrary, studies done in Pakistan which recorded giardiasis in duodenal biopsies show large variation from 1.8% to 44%.[15,20] The reasons responsible for this variation might be due to the size of endoscopic biopsy, staining technique and indiscrimination use of antibiotics and antiamoebic drugs in Pakistan.[20] However, our study is in line with the range of prevalence rate of giardiasis in developing countries (20-40%) and also with other studies from our country where we found higher rates of G. lamblia in males as compared to females.[15,21,22]

The present study revealed 8% co-infection by H. pylori and G. lamblia. Similarly, Ahmed et al. mentioned prevalence rates of co-infection with H. pylori and G. lamblia were (5%) in subjects under study by using direct wet mount while 9% by FECT.[19] These results are in disagreement with the results of Iranian study who observed that co-infections of H. pylori & G. lamblia were found in 4 patients out of 130 (3.8%).[23] Moreover, several studies observed three fold higher risk of concomitant H. pylori and G. lamblia infections compared to non-concomitant infection.[2-4,24]Some investigators reported co-infection of H. pylori with gastric giardiasis which was invariably associated with gastric atrophy, intestinal metaplasia and even with gastric carcinoma.[14,15]A plausible hypothesis is that gastric atrophy and intestinal metaplasia which are well known complications of H. pylori infection may facilitate G. lamblia colonization in stomach.[25,26] Another factor might be the presence of bile reflux which acts as a primary growth factor stimulant for Giardia.[14]

In recent years synergistic microbial infections have gained a tremendous impact. In this, one microbe creates a favorable environment for other. In our study we found a synergistic infection of H. pylori and G. lamblia. The possible microbial interplay among these organisms and to understand their interaction with host immune response indeed needs to be further investigated.

CONCLUSION

This study concludes a high prevalence of H. pylori and G. lamblia in our population. Moreover, we also conclude that co-infection of these organisms is also noted in the study area.

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