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ABOUT COVER

Editorial Board Member of *World Journal of Clinical Cases*, Byung-Wook Kim, MD, PhD, Professor, Division of Gastroenterology, Department of Internal Medicine, Incheon St. Mary's Hospital, the Catholic University of Korea, Incheon 21431, South Korea

AIM AND SCOPE

World Journal of Clinical Cases (*World J Clin Cases*, *WJCC*, online ISSN 2307-8960, DOI: 10.12998) is a peer-reviewed open access academic journal that aims to guide clinical practice and improve diagnostic and therapeutic skills of clinicians.

The primary task of *WJCC* is to rapidly publish high-quality Autobiography, Case Report, Clinical Case Conference (Clinicopathological Conference), Clinical Management, Diagnostic Advances, Editorial, Field of Vision, Frontier, Medical Ethics, Original Articles, Clinical Practice, Meta-Analysis, Minireviews, Review, Therapeutics Advances, and Topic Highlight, in the fields of allergy, anesthesiology, cardiac medicine, clinical genetics, clinical neurology, critical care, dentistry, dermatology, emergency medicine, endocrinology, family medicine, gastroenterology and hepatology, geriatrics and gerontology, hematology, immunology, infectious diseases, internal medicine, obstetrics and gynecology, oncology, ophthalmology, orthopedics, otolaryngology, pathology, pediatrics, peripheral vascular disease, psychiatry, radiology, rehabilitation, respiratory medicine, rheumatology, surgery, toxicology, transplantation, and urology and nephrology.

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Baishideng Publishing Group Inc
7901 Stoneridge Drive, Suite 501, Pleasanton, CA 94588, USA
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Fax: +1-925-2238243
E-mail: editorialoffice@wjgnet.com
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Baishideng Publishing Group Inc
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ORIGINAL ARTICLE

Randomized Clinical Trial

Helicobacter pylori may be an initiating factor in newly diagnosed ulcerative colitis patients: A pilot study

Loai Mansour, Ferial El-Kalla, Abdelrahman Kobtan, Sherief Abd-Elsalam, Mohamed Yousef, Samah Soliman, Lobna Abo Ali, Walaa Elkhalawany, Ibrahim Amer, Heba Harras, Maha M Hagras, Mohamed Elhendawy

Loai Mansour, Ferial El-Kalla, Abdelrahman Kobtan, Sherief Abd-Elsalam, Mohamed Yousef, Samah Soliman, Lobna Abo Ali, Walaa Elkhalawany, Mohamed Elhendawy, Tropical Medicine and Infectious Diseases Department, Faculty of Medicine, Tanta University, Tanta 35127, Egypt

Ibrahim Amer, Hepatology and Gastroenterology Department, Faculty of Medicine, Kafr El-Sheikh University, Kafr El-Sheikh 33511, Egypt

Heba Harras, Pathology Department, Faculty of Medicine, Tanta University, Tanta 35127, Egypt

Maha M Hagras, Clinical Pathology Department, Faculty of Medicine, Tanta University, Tanta 35127, Egypt

ORCID number: Loai Mansour (0000-0002-0224-0759); Ferial El-Kalla (0000-0001-6190-0676); Abdelrahman Kobtan (0000-0002-3493-7657); Sherief Abd-Elsalam (0000-0003-4366-2218); Mohamed Yousef (0000-0002-2817-8017); Samah Soliman (0000-0002-1452-197X); Lobna Abo Ali (0000-0001-7668-0530); Walaa Elkhalawany (0000-0003-2316- 7615); Ibrahim Amer (0000-0003-3778-8826); Heba Harras (0000-0001-7851-9417); Maha M Hagras (0000-0001-7577-9221); Mohamed Elhendawy (0000-0003-3423-4406).

Author contributions: Mansour L, El-Kalla F, Kobtan A and Abd-Elsalam S designed the study; Ali LA, Elkhalawany W, Amer I and Harras H developed the methodology; El-Kalla F, Kobtan A, Abd-Elsalam S and Elhendawy M wrote the manuscript; Mansour L, El-Kalla F, Kobtan A, Abd-Elsalam S, Yousef M, Soliman S, Ali LA, Elkhalawany W, Amer I, Harras H, Hagras MM and Elhendawy M collected the data; Ali LA performed the analysis; all the authors participated sufficiently in the work and approved the final version of the manuscript.

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Correspondence to: Sherief Abd-Elsalam, MD, PhD, Associate Professor, Tropical Medicine and Infectious Diseases Department, Faculty of Medicine, Tanta University, El-Geish Street, Tanta 35127, Egypt. sherif_tropical@yahoo.com
Telephone: +20-10-95159522

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Abstract

AIM

To directly visualize *Helicobacter pylori* (*H. pylori*)

by the highly sensitive and specific technique of immunohistochemical staining in colonic tissue from patients newly diagnosed with ulcerative colitis (UC).

METHODS

Colonoscopic biopsies from thirty patients with newly diagnosed UC and thirty controls were stained with Giemsa stain and immunohistochemical stain for detection of *H. pylori* in the colonic tissue. Results were confirmed by testing *H. pylori* Ag in the stool then infected patients were randomized to receive either anti *H. pylori* treatment or placebo.

RESULTS

Twelve/30 (40%) of the UC patients were positive for *H. pylori* by Giemsa, and 17/30 (56.6%) by immunohistochemistry stain. Among the control group 4/30 (13.3%) and 6/30 (20 %) were positive for *H. pylori* by Giemsa and immunohistochemistry staining respectively. *H. pylori* was significantly higher in UC than in controls (P = 0.04 and 0.007). All Giemsa positive patients and controls were positive by immunohistochemical stain. Four cases of the control group positive for *H. pylori* also showed microscopic features consistent with early UC.

CONCLUSION

H. pylori can be detected in colonic mucosa of patients with UC and patients with histological superficial ulcerations and mild infiltration consistent with early UC. There seems to be an association between UC and presence of *H. pylori* in the colonic tissue. Whether this is a causal relationship or not remains to be discovered.

Key words: Ulcerative colitis; Immunohistochemical staining; Inflammatory bowel disease; *Helicobacter pylori*; Giemsa stain

Core tip: Ulcerative colitis (UC) is a disease of the colon with an unidentified cause. It has been hypothesized that *Helicobacter pylori* (*H. pylori*) infection may play a role in inflammatory bowel disease pathogenesis due to their comparable immunological features**.** *H. pylori* can be detected in colonic mucosa of patients with UC and patients with histological superficial ulcerations and mild infiltration consistent with early UC. There seems to be an association between UC and presence of *H. pylori* in the colonic tissue. Whether this is a causal relationship or not remains to be discovered.

Mansour L, El-Kalla F, Kobtan A, Abd-Elsalam S, Yousef M, Soliman S, Ali LA, Elkhalawany W, Amer I, Harras H, Hagras MM, Elhendawy M. *Helicobacter pylori* may be an initiating factor in newly diagnosed ulcerative colitis patients: A pilot study. *World J Clin Cases* 2018; 6(13): 641-649 Available from: URL: http://www.wjgnet.com/2307-8960/full/v6/i13/641.htm DOI: http://dx.doi.org/10.12998/wjcc.v6.i13.641

INTRODUCTION

Ulcerative colitis (UC) is an inflammatory bowel disease (IBD) of the colon with an unidentified cause. Genetic and environmental elements, in particular the gut bacteria appear to play a role in its development[1]. It has been hypothesized that *Helicobacter pylori* (*H. pylori*) infection may play a role in IBD pathogenesis due to their comparable immunological features[2].

The association between *H. pylori* and UC is subject to much dispute. The impact of bacteria on development of colonic inflammation is supported by the fact that germ-free mice show no signs of bowel inflammation, also among patients with IBD a favorable response may be seen to antibiotic treatment and fecal diversion[3]. On the other hand, some researchers have reported a lower incidence of *H. pylori* in UC patients than in healthy individuals. This may be explained by the immunopathological characteristics of UC and use of antibiotics, sulphasalazine and 5-aminosalicylic acid[4,5].

Many of the studies on the relation between *H. pylori* and UC were based on the presence of the organism in the stomach, a positive serology or breath test in patients with UC[6-8].

Regarding detection of *H. pylori* in UC colonic tissue, most of the studies are based on finding DNA by PCR. The findings could therefore be contested as contaminant DNA could pass to the colon in the faecal stream from food[9].

Therefore we aimed to directly visualize *H. pylori* by the highly sensitive and specific technique of immunohistochemical staining in colonic tissue from patients newly diagnosed with UC who had not received any prior specific treatments.

MATERIALS AND METHODS

This study is a randomized; double blinded, pilot study. A sum of 164 patients referred to the lower endoscopy unit at the Tropical Medicine and Infectious diseases department, Tanta University Hospital; starting from January 2017 till January 2018; were screened for participation in this study.

Inclusion criteria included patients with newly diagnosed UC. Exclusion criteria included patients with contraindication or allergy to any of the drugs included in our study as well as those taking proton pump inhibitors and antibiotics during the 6 wk prior to entry in the trial. Also, pregnant and lactating women and patients suffering from major illnesses such as liver cirrhosis, renal impairment, and gastrointestinal malignancies were excluded from the study.

Diagnosis of UC was based on clinical symptoms, endoscopic and histological findings. Patients without IBD who were undergoing colonoscopy for other reasons and who proved negative for endoscopic findings related to UC were taken as controls. The control group patients were referred to our endoscopy unit for complaints of chronic diarrhea, anemia, abdominal pain, bleeding per

rectum, presence of occult blood in stool and anal pain. A full medical history was taken from all participating patients, they were examined clinically, and clinical and demographic data were recorded.

Full length colonoscopy was performed for all patients, using Pentax colonoscopies. Colonoscopic biopsies were obtained from rectal, sigmoid, descending, transverse, ascending colonic, and cecal mucosa of each patient. All colonic endoscopic biopsy specimens were fixed in 10% buffered formalin, processed and cut at 4 μm and used for histological diagnosis and detection of *H. pylori*.

Histological examination

Histological assessment of the degree of inflammation in UC was evaluated according to Gupta *et al*[9] as follows: Mild cases were those where lymphocytes and plasma cells expanded the lamina propria, with neutrophilic infiltration of surface/crypt epithelium and/or presence of crypt abscesses in fewer than 50% of crypts. In moderately active cases, inflammation and crypt abscesses were present in above 50% of crypts. Severely active cases were characterized by erosions or ulceration.

Giemsa stain for H. pylori

The metachromatic Giemsa solution was added to the slides and allowed to stain for twenty minutes, and then differentiation was performed with a weak acid solution, followed by grades of alcohol. The *H. pylori* organism appears as spiral-shaped, rods or coccoid forms stained with blue color, and the background has varying shades of pink and pale blue color[10].

Immunohistochemical stain for H. pylori

Tissue sections were stained with immunohistochemical stain using a polyclonal antibody directed against the whole *H. pylori* organism (Rabbit polyclonal antibody (Thermo scientific ready to use staining®). Negative controls were sections treated as above, but instead of incubation with the primary antibody, they were incubated with 1% bovine serum albumin/PBS. The *H. pylori* organism appeared as spiral-shaped, rods or coccoid forms stained with a brown color.

Testing for H. pylori antigen in the stool

Monoclonal antibody testing for *H. pylori* Ag in stool was performed for confirmation following detection of the organism in colonic tissue by both Giemsa and Immunohistochemical methods.

Testing for *H. pylori* antigen in the stool was done to confirm infection and to assess cure after therapy. Successful eradication of *H. pylori* was confirmed by a negative result 4 wk after the end of treatment.

Stool specimen collection and storage

Fresh fecal samples were collected into stool sample collection containers. It is required to collect a minimum of 1-2 mL liquid stool sample or 1-2 g solid sample. The collected fecal sample was transported to the lab in a frozen condition (-20 ℃). If the stool sample was collected and tested the same day, it is allowed to be stored at 2 ℃-8 ℃.

H. pylori stool Ag was measured with enzyme linked immunosorbent assay (ELISA) kit (catalogue no. HPY35-k01, Eagle Biosciences, Inc., United States) by sandwich technique and the color change was measured spectrophotometrically at a wavelength of 450 nm.

Randomization of positive UC patients

Patients with UC and positive for *H. pylori* by immunohistochemistry staining and *H. pylori* antigen in the stool were randomly assigned to receive either triple therapy for *H. pylori* or placebo for 2 wk plus mesalazine 4 g daily. The recruited patients were randomized utilizing a computerized random number generator to select randomly permuted blocks and an equal allocation ratio. To ensure concealment; envelopes which were sequentially numbered, opaque and sealed were utilized. Elkhalawany W and Soliman S recruited and enrolled participants. The treatment administered was not known for both the investigators and the patients. The received treatment and placebo were identical in labeling and appearance. Compliance was determined through asking the patients and recovery of empty medication envelopes.

Patients were randomized into two groups: Group Ⅰ: patients receiving triple anti *H. pylori* drugs including clarithromycin 500 mg twice daily, amoxicillin 500 mg twice daily and omeprazole 40 mg twice daily for 2 wk and Group Ⅱ: patients receiving placebo for 2 wk. Both groups received mesalazine 4 g daily.

Before starting the trial, the study received approval by the institutional Ethical Committee of the Faculty of Medicine, Tanta University (code approval No: 30640/12/15). This trial was registered on clinicaltrials.gov (ClinicalTrials.gov Identifier: NCT02423395).

Assessments

Baseline evaluation included thorough history taking, full clinical examination and laboratory testing. All patients were followed weekly during the period of treatment. Patients' were called weekly through their telephone numbers and were asked about the frequency, and severity of motions and if any side effects for the assigned treatment occurred during the previous week. After the end of therapy testing for *H. pylori* antigen in stool was done to assess cure.

Outcomes

The primary outcome of the trial was the number of patients with UC who achieved remission at the end of 2 wk of triple therapy for *H. pylori*. The secondary outcome was the prevalence of *H. pylori* in patients newly diagnosed with UC.

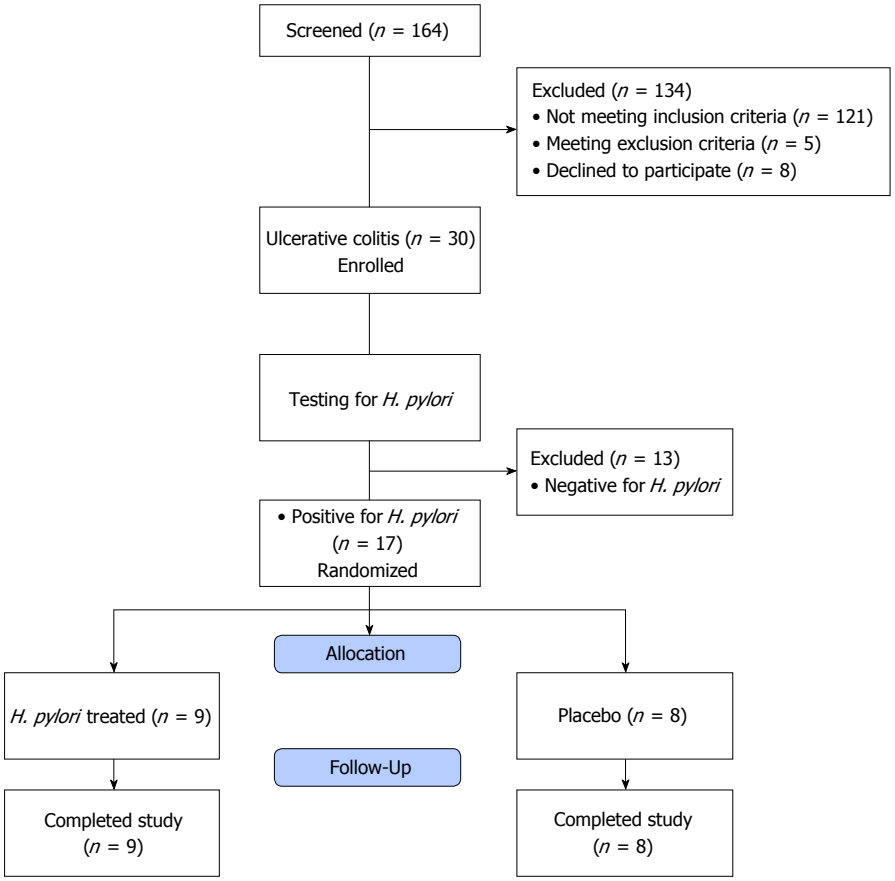

Figure 1 Study analysis population. *H. pylori*: *Helicobacter pylori*.

Statistical analysis

Results were collected, tabulated and statistically analyzed by an IBM compatible personal computer with SPSS statistical package version 20 (SPSS Inc. released 2011. IBM SPSS statistics for windows, version 20.0, Armonk, NY: IBM Corp., United States). Student's *t*-test is of significance was performed to compare quantitative variables between two groups of normally distributed data, while Mann Whitney's test was performed to compare quantitative variables between two groups of abnormally distributed data. χ^2 test was performed to examine association between qualitative variables., Fischer's Exact test with Yates correction was used when cells were fewer than five. Z test was used to compare two proportions in two groups. A *P*-value of < 0.05 was considered statistically significant.

RESULTS

In sum, 164 patients were screened for study participation. One hundred and thirty-four patients were excluded from the study. One hundred and twenty-one patients did not fulfill the inclusion criteria, 5 fulfilled the exclusion criteria and 8 declined to participate. Thus, 30 patients with newly diagnosed UC were enrolled in this study. They were 18 males and 12 females; their mean age was 38.9 ± 14.7 years (Figure 1).

Thirty patients without IBD who were undergoing colonoscopy for other reasons and who proved negative for endoscopic findings related to UC were taken as controls. They were 20 males and 10 females, their mean age was 49.4 ± 4.1 years.

Clinical manifestations of all participants in the study are demonstrated in Table 1. Patients with UC had significantly higher rates of abdominal pain, bloody diarrhea, chronic non-bloody diarrhea, fatigue, tenesmus and anemia than those in the control group. Laboratory investigations of the studied groups are shown in Table 2. Patients with UC had significantly lower hemoglobin concentrations and platelet count but higher WBC counts than those of the control group. Both 1st and 2nd hour erythrocyte sedimentation rate (ESR) levels were significantly higher in UC patients. None of the patients included in the study had any gastric complaints and therefore upper GI endoscopy was not performed.

Colonoscopy for the 30 patients of the control group proved unremarkable for 22 patients, revealed internal piles in 7 patients and a rectal polyp in one. Among the control group; 14 patients (46.67%) had a normal mucosal appearance, while 11 (36.66%) proved to have microscopic findings of chronic non-specific colitis, 5 patients (16.66%) had early microscopic features of UC in the form of superficial ulcerations and mild infiltration.

Among the UC group patients 12/30 (40%) of the

Table 1 Clinical manifestations of all participants in the study *n* (%)

Clinical manifestations	Ulcerative colitis (*n* = 30)	Control (*n* = 30)	*P* value
Abdominal pain	26 (86.6)	20 (66.6)	0.120
Bloody diarrhea	24 (80)	0 (0)	< 0.001[a]
Chronic non bloody diarrhea	6 (20)	22 (73.3)	< 0.001[a]
Fatigue	16 (53.3)	5 (16.6)	0.006[a]
Tenesmus	20 (66.6)	5 (16.6)	< 0.001[a]
Bleeding per rectum	0 (0)	8 (26.6)	0.007[a]
Constipation	0 (0)	4 (13.3)	0.120
Rectal pain	2 (6)	5 (16.6)	0.420
Anemia	24 (80)	9 (30)	0.001[a]

[a]*P* value of < 0.05 is considered statistically significant.

Table 2 Laboratory investigations of the studied groups

		Ulcerative colitis (*n* = 30) mean ± SD	Control (*n* = 30) mean ± SD	*P* value
CBC	HB g/dL	9.52 ± 3.44	11.42 ± 2.02	0.010[a]
	Platelets 10^3/mL	140.62 ± 83.91	195.7 ± 87.23	0.004[a]
	WBC cells/mL	8.65 ± 4.25	4.35 ± 2.58	< 0.001[a]
Liver functions	Bilirubin mg/dL	0.84 ± 0.41	0.75 ± 0.38	0.380
	Albumin g/dL	3.24 ± 1.42	3.82 ± 1.31	0.100
	AST IU/L	26.01 ± 12.00	21.1 ± 10.1	0.090
ESR	1st h	37.20 ± 18.10	15.03 ± 7.41	< 0.001[a]
	2nd h	46.12 ± 19.32	23.41 ± 9.13	< 0.001[a]

[a]*P* value of < 0.05 is considered statistically significant. ESR: Erythrocyte sedimentation rate; WBC: White blood cell; AST: Aspartate transaminase.

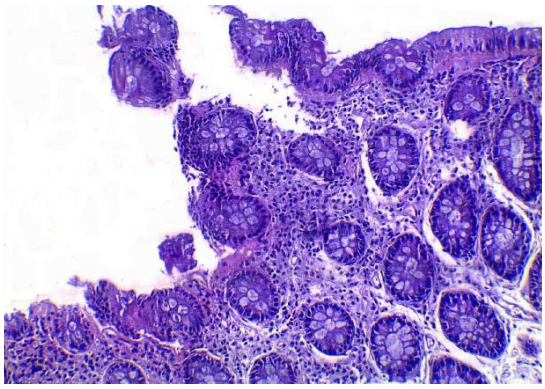

Figure 2 Demonstrates diffuse mononuclear inflammatory infiltrate in lamina propria and neutrophilic infiltration of the intestinal mucosa with ulceration of the surface epithelium as early changes of ulcerative colitis (HE: × 200).

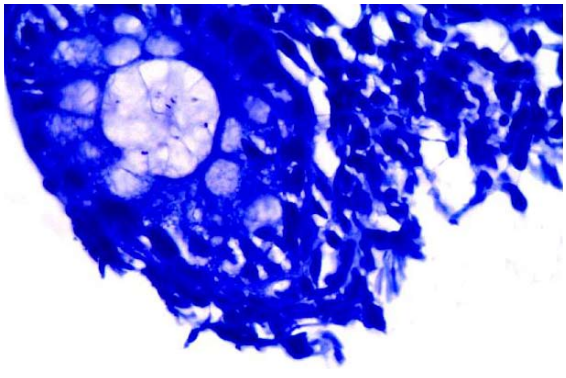

Figure 3 Giemsa staining of the previous case showing *Helicobacter pylori* positive rod shape organisms (Giemsa stain: × 1000).

patients were positive for *H. pylori* by Giemsa staining, whereas 17/30 (56.6%) were positive for *H. pylori* by immunohistochemistry stain confirmed by testing *H. pylori* Ag in the stool.

In the control group 4/30 patients (13.33%) of the patients were positive for *H. pylori* by Giemsa staining (Figures 2 and 3), whereas 6/30 (10%) were positive for *H. pylori* by immunohistochemistry stain, yet even though the yield of immunohistochemical staining was higher than with Giemsa staining, this did not reach statistical significance (Table 3, Figures 4 and 5). Both Giemsa and immunohistochemical stains had significantly higher positive results for *H. pylori* in UC group than the control group ($P = 0.04$ and $P = 0.007$ respectively (Table 4).

It was interesting to note that 4 of the control cases that proved to have *H. pylori* showed microscopic features consistent with early UC even though there was no evidence of this on endoscopy. Those 4 patients were advised for follow up programme. All Giemsa positive patients were positive by immunohistochemical staining for *H. pylori*. Histopathological diagnosis in relation to *H. pylori* staining in the control group patients is demonstrated in Table 5. Patients with UC and positive for *H. pylori* ($n = 17$) were randomly assigned to receive either triple therapy for *H. pylori* ($n = 9$) or placebo ($n = 8$) for 2 wk (Figure 1).

There were no significant differences in baseline ESR, C reactive protein (CRP), and number of motions per day between the *H. pylori* treated and the placebo group ($P > 0.05$). In the *H. pylori* treated group, ESR, CRP, and number of motions per day were significantly

Table 3 Comparison between Giemsa stain and Immunohistochemical stain in detection of *Helicobacter pylori* in all patients

Detection of *H. pylori*			
Ulcerative colitis		**Control**	
Giemsa stain	Immunohistochemical stain	Giemsa stain	Immunohistochemical stain
12/30 (40%)	17/30 (56.6%)	4/30 (13.3%)	6/30 (20%)
$P = 0.30$		$P = 0.72$	

H. pylori: *Helicobacter pylori*.

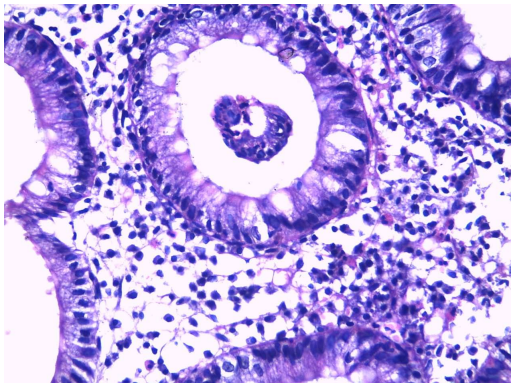

Figure 4 Ulcerative colitis showing crypt abscess and diffuse mononuclear inflammatory infiltrate in lamina propria with eosinophilia (HE: × 400).

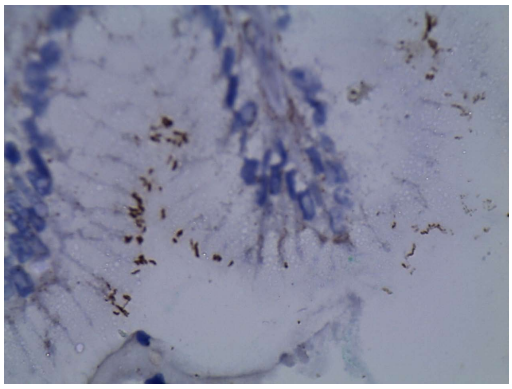

Figure 5 Immunoperoxidase staining showing *Helicobacter pylori* positive organisms stained brown in color (immunoperoxidase stain: × 1000).

decreased after 2 wk of therapy when compared to baseline ($P < 0.001$). Two patients out of 9 still had blood streaks in stool after 2 wk of therapy. There was no significant change following treatment with placebo (Table 6). The regimen was well tolerated by all patients and mild side effects were reported in 1 patient who had nausea. All patients in the *H. pylori* treated group had negative *H. pylori* antigen in stool 4 wk after the end of therapy.

DISCUSSION

The role of *H. pylori* in IBD is a subject of much study and remains unresolved as yet. A number of studies have suggested that *H. pylori* infection plays a role in protection from occurrence of IBD[11,12]. Sonnenberg and Genta[13] in 2012 reported that presence of the organism in the stomach had an inverse association with IBD. There is much diversity among these studies, and most of the mare dependent on detection of the organism in gastric biopsies, breath test analysis or serum antibody testing.

On the other hand some studies have indicated a link between IBD and *H. pylori*; *H. pylori* was detected in 36.7% of IBD patients using a biopsy urease test and 30% using H and E staining of colonic tissue from IBD patients[14]. Streutker *et al*[15] detected *H. pylori* ribosomal DNA in colonic tissue from 5 of 33 (15.15%) UC patients. Multiple techniques for *H. pylori* detection in colonic tissue are available; the hematoxylin and eosin stain has been found to be the most unreliable for diagnosis of *H. pylori* infection[16].

Giemsa staining for *H. pylori* detection is well known to be a reliable, easy to perform and inexpensive technique to detect the spiral forms and therefore is usually considered as the stain of choice[17]. Immunohistochemistry is more precise in diagnosis as it uses an anti *H. pylori* antibody that reacts with the somatic antigens of the whole organism and can detect low density infections as well as non spiral coccoid forms of the organism which are non culturable and very difficult to detect[18-21].

H. pylori is highly prevalent in Egypt with rates of up to 88% in the normal population, making use of the urea breath test or ELISA of no benefit to our study[22-24]. Studies utilizing PCR PCR-only studies can be criticized as there is a possibility that contaminant environmental DNA transited to the colon from food could affect the results[9].

Therefore we aimed at directly visualizing the organism in colonic tissue using the two most reliable methods, Giemsa staining and immunohistochemical staining for *H. pylori*. We studied patients newly diagnosed with UC who had not previously received 5-aminosalicylates or sulphasalazine as it has been suggested in studies on gastric infection that they block adhesion of *H. pylori* to the mucosa and inhibit replication of the bacterium[25,26].

In our UC patients, *H. pylori* was detected in 12/30 (40%) by Giemsa staining, and 17/30 (56.6%) by immunohistochemistry stain. This was significantly higher than among our controls of whom 4/30 (13.3%) proved to have *H. pylori* in their colonic biopsies by Giemsa staining and 6/30 (20%) by immunohistochemical staining ($P = 0.04$ and $P = 0.007$ respectively)

Table 4 Comparison between ulcerative colitis patients and controls regarding presence of *Helicobacter pylori* as detected by Giemsa and immunohistochemical staining

Detection of *H. pylori*			
Giemsa stain		**Immunohistochemical stain**	
Ulcerative colitis	Control group	Ulcerative colitis	Control group
12/30 (40%)	4/30 (13.3%)	17/30 (56.6%)	6/30 (20%)
$P = 0.04$[a]		$P = 0.007$[a]	

[a]*P* value of < 0.05 is considered statistically significant. *H. pylori*: *Helicobacter pylori*.

Table 5 Histopathological diagnosis in relation to *Helicobacter pylori* staining in control group patients

Histopathological diagnosis	Giemsa stain		Immunohistochemical stain	
	***H. pylori* positive (*n* = 4)**	***H. pylori* negative (*n* = 26)**	***H. pylori* positive (*n* = 6)**	***H. pylori* negative (*n* = 24)**
Normal 14/30 (46.67%)	0	14	0	14
Chronic nonspecific colitis 11/30 (36.66%)	1	10	2	7
Early microscopic features of UC 5/30 (16.66%)	3	2	4	3

H. pylori: *Helicobacter pylori*; UC: Ulcerative colitis.

Table 6 Erythrocyte sedimentation rate, C reactive protein, number of motions per day in the *Helicobacter pylori* treated and placebo group at baseline and after 2 wk of treatment

	***H. pylori* treated (*n* = 9)**			**Placebo (*n* = 8)**		
Parameters	**Baseline**	**After 2 wk**	***P*-value**	**Baseline**	**After 2 wk**	***P*-value**
ESR (1st)	38.56 ± 9.81	22.33 ± 5.55	< 0.001	37.50 ± 7.82	32.75 ± 6.34	0.203
ESR (2nd)	64 (54.25-73.25)	32 (30.5-37.5)	< 0.001	65.63 ± 11.51	58.75 ± 9.33	0.211
CRP	24 (22.5-36)	12 (6-12)	0.001	25.75 ± 9.29	24.12 ± 9.68	0.737
No. of motions per day	8 (6.75-9)	3 (2-3.25)	< 0.001	7.63 ± 1.41	6.88 ± 1.64	0.343

Data are presented as median (interquartile range) or mean and standard deviation. CRP: C reactive protein; ESR: Erythrocyte sedimentation rate.

and indicates a possible link between *H. pylori* and UC.

These numbers are much lower than those of *H. pylori* prevalence in the Egyptian population and therefore do not reflect the prevalence of *H. pylori* in general. We believe the link between the two conditions to be logical as focal cryptitides are usually associated with *H. pylori* infection and they are characteristic of UC too[8]. The main pathological features of UC are continuous, superficial inflammation of the colorectal mucosa, with cryptitides and crypt abscesses[27].

In the control group of our study, four of the six cases in whom *H. pylori* was detected had a pathological pattern resembling early UC in the form of superficial ulcerations and mild infiltration raising the question of the possible effect of the infection on colonic tissue by inducing a local inflammatory response.

The chronic inflammation in UC could be caused by increased cellular production of nitric oxide (NO) in response to the *H. pylori* lipopolysaccharide as well as direct mucosal damage caused by urease and cytotoxins. Platelet activation and aggregation can lead to formation of microthrombi epithelium causing infarction and development of ulcers[28-30].

In our study, immunohistochemistry appeared to be a more reliable technique for tissue diagnosis of *H. pylori* infections there were more cases diagnosed by immunohistochemical staining than Giemsa; 56.6% *vs* 40% in the UC group ($P = 0.30$) and 20% *vs* 13.3% among the control cases ($P = 0.72$), however the difference did not reach statistical significance.

H. pylori can be detected in colonic mucosa of patients with UC and patients with histological superficial ulcerations and mild infiltration consistent with early UC. There seems to be an association between UC and presence of *H. pylori* in the colonic tissue. Whether this is a causal relationship or not remains to be discovered.

ARTICLE HIGHLIGHTS

Research background

Ulcerative colitis (UC) is an inflammatory bowel disease (IBD) of the colon with an unidentified cause. Genetic and environmental elements, in particular the gut bacteria appear to play a role in its development. It has been hypothesized that *Helicobacter pylori* (*H. pylori*) infection may play a role in IBD pathogenesis due to their comparable immunological features.

Research motivation

The association between *H. pylori* and UC is subject to much dispute. The impact of bacteria on development of colonic inflammation is supported by

the fact that germ free mice show no signs of bowel inflammation, also among patients with IBD a favorable response may be seen to antibiotic treatment and faecal diversion.

Research objectives

To directly visualize *H. pylori* by the highly sensitive and specific technique of immunohistochemical staining in colonic tissue from patients newly diagnosed with UC.

Research methods

Colonoscopic biopsies from thirty patients with newly diagnosed UC and thirty controls were stained with Giemsa stain and immunohistochemical stain for detection of *H. pylori* in the colonic tissue. Results were confirmed by testing *H. pylori* Ag in the stool then infected patients were randomized to receive either anti *H. pylori* treatment or placebo.

Research results

Twelve/30 (40%) of the UC patients were positive for *H. pylori* by Giemsa, and 17/30 (56.6%) by immunohistochemistry stain. Among the control group 4/30 (13.3%) and 6/30 (20%) were positive for *H. pylori* by Giemsa and immunohistochemistry staining respectively. *H. pylori* was significantly higher in UC than in controls (P = 0.04 and 0.007). All Giemsa positive patients and controls were positive by immunohistochemical stain. Four cases of the control group positive for *H. pylori* also showed microscopic features consistent with early UC.

Research conclusions

H. pylori can be detected in colonic mucosa of patients with UC and patients with histological superficial ulcerations and mild infiltration consistent with early UC. There seems to be an association between UC and presence of *H. pylori* in the colonic tissue. Whether this is a causal relationship or not remains to be discovered.

Research perspectives

There seems to be an association between UC and presence of *H. pylori* in the colonic tissue. Whether this is a causal relationship or not remains to be discovered.

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