Medical Journal of the
Islamic Republic of Iran

Volume 5
Number 1,2
Bahar & Tabestan 1370
Spring & Summer 1991

THE ASSOCIATION OF *CAMPYLOBACTER PYLORI (HELICOBACTER PYLORI)* WITH GASTRITIS AND PEPTIC ULCER

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ABSTRACT

We studied the relationship between gastroduodenal inflammation and the presence of *Campylobacter pylori* from biopsy specimens of the gastric mucosa in 91 patients with gastritis with or without ulcers and 9 controls, healthy or suffering from other diseases.

68 of the patients were positive for the presence of *C. pylori* in their gastric mucosa. *C. pylori* was confirmed bacteriohistologically in 22 out of 31 cases with chronic gastritis, six of nine cases with gastric ulcer, 14 of 18 cases with duodenitis and 26 of 28 cases with duodenal ulcer.

The control group and five patients with gastric cancer, all were negative for the presence of *C.pylori.*

Our results are in agreement with the published data confirming the close association between chronic gastroduodenal inflammation and *Campylobacter pylori.*

MJIRI, Vol.5, No. 1,2, 19-22, 1991

INTRODUCTION

The presence of spiral germs in the gastric mucosa was observed several decades ago.[1] In 1983 Marshall & Warren demonstrated the association between *C. pylori* and gastroduodenal inflammation.[2] In the same study people without gastritis were essentially free of the organism.

These results have now been confirmed in numerous studies. Recent studies show nearly 100% association between *C. Pylori* infection with type B gastritis. This type of gastritis is uncommon in childhood and increases progressively during adulthood.

The present paper is the first Iranian bacteriological investigation which is based on the isolation and studying of *C. Pylori* using clinical and histological data.

MATERIALS AND METHODS

Taking and Transport of Material

Samples were taken from the gastric mucosa of 100 subjects who had come for chronic gastropathy (suspect ulcer included). Three mucosa samples were collected from one patient, one of which was introduced in formaldehyde 12% for histologic examination and another in thioglycolate broth (Campy-thio) with 0.16% agar as a conservation medium and the last was placed in Christeinsen's urea broth. All of the samples were examined on the same day.

Histologic Examination

The sections were stained with hematoxylin-eosin for determining the gastritis lesions, and Giemsa for observation of *C. pylori* within intracellular junctions of gastric epithelial cells.

The degree of alteration of the mucosal epithelium, glands, and, particularly, the presence and intensity of the lymphoplasmacytic infiltrate, characterizing chronic gastritis were studied.

Bacteriologic Procedures

A smear was obtained from one of the biopsy

Table -I. Structure of the age group according to pathological criteria

Syndrome diagnosed	Total No	Age group (years)							
		No	20	21-30	31-40	41-50	51-60	61-70	70
Gastritis	31	%	2	6	2	8	7	4	2
Duodenitis	18	%	-	4	4	4	2	3	1
Gastric ulcer	9	%	-	-	3	-	3	2	1
Duodenal ulcer	28	%	2	5	10	2	7	2	-
Gastric cancer	5	%	-	-	-	3	1	-	1
Normal	9	%	3	1	-	-	1	4	-

Table II. Distribution per age group

Group	Total No	Age group (years)							
		No	20	21-30	31-40	41-50	51-60	61-70	70
Male	67	No	4	12	13	11	18	13	5
		%	(4)	(12)	(13)	(11)	(18)	(13)	(5)
Female	24	No	3	4	6	6	3	2	-
		%	(3)	(4)	(6)	(6)	(3)	(2)	-
Total	100	No	7	16	19	17	21	15	-
		%	(7)	(16)	(19)	(17)	(21)	(15)	-

The study group age ranged from 14 to 81 years

specimens triturated under sterile conditions and used for microscopic examination and inoculation on media.

The rest of the sample was placed immediately in the endoscopy room, into a tube containing 1 ml of freshly prepared 10% W/V urea in deionized water at pH 6.8 including two drops of 1% phenol-red. In this "one-minute urease test" a positive result was recorded if the colour changed from yellow to pink within a minute.

Microscopic Examination

The smears were triple stained with Gram, carbol fusch in 0.2% and fuschin 1%. The latter proved more rapid and efficient hence it was used routinely both for smears from the sample and from culture. The stained smears were examined under immersion.

Cultures

The triturate was inoculated on plates with chocolate campylobacter selective agar supplemented with 7.5% sheep blood, and campylobacter selective supplement.

The plates were incubated at 37°C in a microaerophilic atmosphere for 5-7 days providing a high degree of humidity.

Identification

Identification was based upon evidence of the morphologic character of the smears from suspect cultures, and confirmed by oxidase, catalase and urease and hippurate hydrolysis tests, representing the basic identification criteria.

Biochemical characteristics of the isolates were performed on triple sugar iron agar for production of SH, SIM for production of Indole and motility, and for nitrate reduction, nitrate agar medium was used.

Susceptibility to nalidixic acid and cepholothin and other antimicrobial agents was tested on Columbia blood agar base.

RESULTS

The study group included 91 subjects, 76 males (76%) and 24 females (24%) and the patient's age ranged from 16 to 76 years (Table I and II). *C. pylori* was detected in 68 of 91 patients (77%) and none of the controls. The association of *C.pylori* with each syndrome diagnosed endoscopically and confirmed histologically was:

Group 1. Gastritis without ulcer - 31 patients diagnosed, *C. pylori* was confirmed in 22 cases (70%).

Group 2. Duodenitis without ulcer - 18 patients diagnosed, *C. pylori* was confirmed in 14 cases (78%).

Group 3. Gastric ulcer - 9 patients diagnosed, *C. pylori* was confirmed in six cases (67%).

Group 4. Duodenal ulcer - 28 patients diagnosed, *C. pylori* confirmed in 26 cases (93%).

Group 5. Gastric cancer - 5 patients diagnosed, *C. pylori* was absent.

Group 6. In all the controls *C.pylori* was absent (Table III).

Culture and Identification of *C. pylori*

Evidence of *C.pylori* was found in 68 cases (68%) of the 91 patients. In the group studied, *C. pylori* cultures developed after 5-7 days of incubation at 37°C in a microaerophilic atmosphere. The *C. pylori* colonies are small, 1-2 mm in diameter, regular and translucent, and sharply differentiated from the *C.jejuni* colonies.

The morphology of *C. pylori* on the smears prepared from cultures differs from that observed *in situ*, the germs appearing more frequently in the.from of long bacilli with few evident curves in "bullhorn" form. On aging or repeated passages they are difficult to recognize.

To define the species diagnosis, the morphologic and culture characteristics were completed by oxidase, catalase, urease and hippurate hydrolysis tests and other biochemical tests.

Susceptibility to Antimicrobial agents

The results show that *C.pylori* were sensitive to erythromycin, cephalothin, gentamicin, tetracycline and chloramphenicol and resistant to nalidixic acid and vancomycin.

Table III. Relation of the syndrome with the presence of *Campylobacter pylori*

crt no. of group	Category of group	No. exam	Bacteriologic confirmation			Pathology	Total positive		Total negative	
			Bacteriologic exam	Culture exam	Ureas exam		No	%	No	%
1	Gastritis	31	9	7	8	21	22	70.97	9	29.03
2	Duodenitis	18	5	4	8	14	14	77.7	4	22.3
3	Gastric ulcer	9	6	6	4	5	6	66.6	3	33.3
4	Duodenal ulcer	28	20	21	2	117	26	92.8	2	7.2
5	Gastric cancer	5	-	-	-	-	-	-	5	100
6	Normal	9	-	-	-	-	-	-	9	100
TOTAL		100	40	38	41	57	68	68	32	32

DISCUSSION

Our results confirm the association of *C.pylori* with gastritis, with or without ulcer.

The positivity indices of 70% in gastritis, 78% in duodenitis, 67% in gastric ulcer, and 93% in duodenal ulcer are in agreement to those of the authors mentioned in Table IV.

Similar to the finding of other authors, we also observed in our group a higher proportion of *C. pylori* associated with duodenal ulcer (93%) as compared with gastric ulcer (67%) and gastritis without ulcer (70%).

It is possible that this reduced positivity proportion in gastritis patients might be explained in that no differentiation was established between primary antral gastritis and gastritis due to a given cause such as type A gastritis in pernicious anemia, erosive gastritis and reflux of biliary acids that may disrupt the mucous and the viability of *C. pylori* in the subepithelial layers.

In conclusion, our data reveals the close relationship between *C. pylori* and type B chronic gastritis associated with or without ulcer.

At present, there are no data on the epidemiology of *C. pylori* infection and the host factors that lead to chronicity. Further studies of the effect of eradicating the organism on the natural history of gastritis and peptic ulcer disease are needed to assess its role in ulcer or infectious disease.

Table IV. Bibliographic data

Normal	Duodenal ulcer	Gastric ulcer	Gastritis	Year	Authors
-	100	66.7	-	1984	Langenberg, et al
0	95	74.3	75.8	1984	Mc Nulty, et al
-	-	-	73.4	1984	Meyrick, et al
5.3	-	-	34*	1985	Bohnen, et al
-	-	-	64	1985	Girdwood, et al
-	-	-	80	1985	Ishii, et al
14.3	-	-	69.2	1985	Lee, et al
10	-	-	90.9	1985	Lopez. Brea, et al
9	-	-	70.9	1985	Pearson, et al
15	-	-	69	1986	Buck, et al
6.2	94	33	89.5	1987	Csiszar, et al
-	98	77.8	77.4	1987	Hirschl, et al
-	-	-	47*	1987	Menge, et al
-	100	84.5	63.7	1988	Rusu, et al
-	92.8	66.6	70.79	1989	Our result

§Data exclusively obtained with culture (without microscopic exam)

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