Original Article

Helicobacter pylori Serology in a Sample of Iraqi Patients with Chronic Renal Failure

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Abstract

Background: The prevalence of gastrointestinal (GI) symptoms is high in patients with chronic renal failure. Peptic ulcer disease occurs in up to one-fourth of them. Many factors are implicated in its causation including *Helicobacter pylori* infection. **Objective:** The objective of the study was to determine the prevalence of *H. pylori* seropositivity in patients with GI symptoms and chronic renal failure compared with the prevalence of *H. pylori* seropositivity in patients with GI tract symptoms with normal renal function and to evaluate the importance of different factors that affect its prevalence depending on serological test for immunoglobulin level against *H. pylori*. **Materials and Methods:** This case–control study was done at the Department of Medicine, at Al Yarmook Teaching Hospital, Baghdad, Iraq. During the study period from January to June in 2004, ninety patients with chronic renal failure were interrogated for dyspeptic symptoms and 2 mL of blood was withdrawn for ELISA test for anti-*H. pylori* serological examination. Twenty-five dyspeptic patients with normal renal function were examined as well as control group. **Results:** from 90 patients with chronic renal failure, 42 patients were on hemodialysis and 48 patients were on peritoneal dialysis. There were 52 males and 38 females with age ranging 45.3 in male and female 43.1, respectively. The percentage of positive anti-*H. pylori* antibody was 60%. Only 44% of the control group had positive anti-*H. pylori* results. There was no statistically significant difference between anti-*H. pylori* positive and negative status in patients on hemodialysis, peritoneal dialysis, and control group regarding male and female gender. Again, there was no statistically significant difference in serpositivity in relation to epigastric pain and those without epigastric pain in the group of hemodialysis, peritoneal dialysis, and control group. Patients on peritoneal dialysis with dyspepsia of < 10 years had statistically significant seropositivity compared to those more than 10 years of epigastric pain. Those patients with hemodialysis and control group have no relation of seropositivity with dyspepsia duration. **Conclusions:** *H. pylori* serpositivity of patients with chronic renal failure was similar to that of the control. There is no relation between dyspepsia and *H. pylori* serpositivity. Long-term dialysis is associated with a decreased prevalence of *H. pylori*.

Keywords: Chronic renal failure, epigastric pain, *Helicobacter pylori,* seropositivity

Introduction

The prevalence of gastrointestinal (GI) symptoms is high in patients with chronic renal failure.[1]

Peptic ulcer disease occurs in up to one-fourth of patients with chronic renal failure. Some of the factors implicated in its causation include hypergastrinemia, secondary hyperparathyroidism, drugs, and recently *Helicobacter pylori* infection. The study in the latter has been few.[2] The patient on hemodialysis often suffers from xerostomia, parotitis, disturbance of taste, and gingival bleeding. Dialysis patients may be exposed to specific risk factors, such as the use of nonsteroidal anti-inflammatory agents or hypercalcemia, mainly as a result of hyperparathyroidism or inappropriately high dialysate calcium. Silent ulceration is not uncommon.

GI bleeding is one of the most common problems with frequent causes which may include the use of ulcerogenic drugs, with or without peptic ulceration, erosive gastritis, oesophagitis and duodenitis, Mallory–Weiss syndrome, and hemorrhagic diathesis.

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Nausea and vomiting in dialysis patients will usually be caused by uremia.[3,4]

Since peptic ulcer disease is frequent in patients with end-stage renal failure, preliminary reports have addressed the epidemiology of antibodies to *H. pylori* in patients on chronic hemodialysis, peritoneal dialysis, and renal transplant recipients.[5,6]

The aim of the study is to assess the relation of seropositivity of *H. pylori* in chronic renal failure patients to the prevalence of dyspeptic symptoms and compared to the control group of patients with upper GI symptoms with normal renal function as well.

Materials and Methods

From January to June 2004, ninety patients of different ages and sex with chronic renal failure with varied upper GI symptoms were studied in Al Yarmook Teaching Hospital, at the renal dialysis unit for the serological prevalence of *H. pylori* immunoglobulin IgG antibodies. In addition, 25 dyspeptic patients with matching age and sex but with normal renal function who were undergoing upper GI endoscopy procedure for dyspepsia were tested similarly for *H. pylori* antibodies. The patients were interrogated for their complaints besides other information about age, sex, residence, family size, source of drinking water, smoking habits, and drug history.

In addition, patients with chronic renal failure were asked about the type of dialysis, causes of renal failure, complications of renal failure, drug history about calcium carbonate ingestion, one α, erythropoietin, average hemoglobin level, average blood urea and serum creatinine, serum calcium, and glomerular filtration rate. A blood sample of 2 mL was aspirated from every subject. The serum was tested for *H. pylori* antibodies produced by BIO-RAD FUJIREBIO, Inc. (PLATELIA® *H. pylori*) The principle of the test is to detect human IgG antibodies (anti-*H. pylori*) in serum by enzyme immunoassays. The microplates were sensitized with a semi-purified antigen extract that contains no flagellar antigens likely to cause cross-reactions. The serum specimens are dispensed into microplate walls. The microplate is washed to remove unbound IgGs, and human IgG antibodies to *H. pylori* are revealed by adding a peroxidase-labeled monoclonal antibody to human IgG.[7]

In adults, samples with an anti-*H. pylori* IgG titer <10 U/ml were diagnosed as sero-negative for *H. pylori*. Samples with an anti-*H. pylori* IgG titer ≥10 U/ml were diagnosed as sero-positive for *H. pylori*.[7]

Ethical consideration

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with patients' verbal and analytical approval before the sample was taken. The study protocol and the subject information and consent form were reviewed and approved by a local ethics committee.

Results

During the study period, ninety patients with chronic renal failure were studied. Forty-two patients were on hemodialysis and 48 patients were on peritoneal dialysis. There were 52 males and 38 females with age ranging 45.3 in male and 43.2 in female [Table 1].

Table 2 demonstrates the percentage of positive anti-*H. pylori* groups. Sixty percent (54/90) of total chronic renal failure patients had a positive serum for anti-*H. pylori* antibody, in which 59.5% (25/42) were within the hemodialysis subgroup and 60.4% (29/48) within the peritoneal dialysis subgroup. Only 44% (11/25) of the control group had positive anti-*H. pylori* results.

Table 3 shows that there was no statistically significant difference between anti-*H. pylori* positive and negative patients on hemodialysis, peritoneal dialysis, and control group regarding male gender, in which the percent was 64% (16/25), 55% (15/27), and 41.7% (5/12), respectively.

Similarly, in the female patient, the results show no statistically significant difference between anti-*H. pylori* positive and negative patients on hemodialysis, peritoneal dialysis, and control group in which it is 52.9% (9/17), 66.7% (14/21), and 46.2% (6/13), respectively.

Table 4 again demonstrates that there was no statistically significant difference in serpositivity in relation to epigastric pain (which is taken as a main complaint for dyspepsia group of symptoms) and those without epigastric pain in the group of hemodialysis, peritoneal dialysis, and control group. Seropositive patients with epigastric pain were 55.6% (10/18),

Table 1: The age and gender distribution

Age group (years)	Control			RF		
	n (%)	Gender		*n* (%)	Gender	
		Male	Female		Male	Female
<30	3 (12)	1	2	12 (13.3)	6	6
30–39	5 (20)	2	3	23 (25.6)	12	11
40–49	3 (15)	2	1	25 (27.8)	17	8
50–59	4 (16)	2	2	15 (16.7)	8	7
60–69	5 (20)	3	2	10 (11.1)	4	6
≥70	5 (20)	2	3	5 (5.6)	5	0
Total	25 (100)	12	13	90 (100)	52	38
Mean±SD (range)	50.80±16.23 (23–74)			44.42±13.71 (17–75)		

SD: Standard deviation, RF: Renal Failure

Table 2: The seropositivity of different study groups

	Control, *n* (%)	HD, *n* (%)	PD, *n* (%)	Total RF
Sero-positive	11 (44.0)	25 (59.5)	29 (60.4)	54(60)
Sero-negative	14 (56.0)	17 (40.5)	19 (39.6)	36 (40)
Total	25	42	48	
Compared to control, *P*	-	>0.05	>0.05	

Not significant. HD: Hemodialysis, PD: Peritoneal dialysis

66.7% (16/24), and 44% (11/25) in hemodialysis, peritoneal dialysis, and control group, respectively. Seropositive patients without epigastric pain were 62% (15/24) and 54% (13/24) in hemodialysis and peritoneal dialysis, respectively.

Table 5 demonstrates the relationship between serpositivity and duration of dyspepsia. Patients on peritoneal dialysis with dyspepsia of < 10 years had statistically significant seropositivity 73.7% (14/19) compared to those more than 10 years' duration of epigastric pain 40% (2/5).

In contrast, those patients with hemodialysis and control groups had no statistically significant difference in seropositivity and dyspepsia duration.

Discussion

The presence of *H. pylori* in the gastric mucosa of humans is associated with dyspepsia, peptic ulcers, and gastric carcinoma.[8,9] However, a clear discrepancy between the number of infected individuals and patients with clinical symptoms exists. In our study, we could not demonstrate a statistically significant difference between the prevalence of *H. pylori* in chronic renal failure patients (60%) and control group (40%) ($P > 0.05$). This finding is similar to the work carried by Karari *et al*. in Nairubi where they carried out a prospective study of 77 consecutive patients with chronic renal failure and dyspepsia, compared with consecutive age, sex, and socioeconomically matched 77 controls (no chronic renal failure) with dyspepsia and they found that there were no statistically significant difference and concluded that dyspepsia in patients with or without chronic renal failure was due to multiple causes and over 50% were attributed to *H. pylori*.[2] However, when we compare hemodialysis and peritoneal dialysis subgroups [Table 3], we find similarly there is no statistically significant difference in seropositivity of *H. pylori* in the two groups. However, this is not similar to the finding of Schoonjans *et al*. in Belgium were they studied 66 patient with hemodialysis and 28 patients with peritoneal dialysis. They found that the prevalence of *H. pylori* was highest in hemodialysis (46.2%) compared to 28.6% in patients with peritoneal dialysis ($P < 0.02$) and noted that the physiopathological mechanism and clinical impact of these findings merit further investigation.[10]

The findings in Table 4 show that there is no statistically significant difference in seropositivity in relation to epigastric pain (which is taken as the main complaint of dyspepsia) and those without epigastic pain in the group of hemodialysis, peritoneal dialysis, and control group which is similar to the result of Abou-Saif and Lewis, where they indicated that the prevalence of dyspepsia, ulcer disease, and *H. pylori* gastritis is not significantly different from the general population.[11] Regarding the relation of duration of dyspepsia and serpositivity [Table 5], the less prevalence of seropositivity, could be explained on the basis of more prevalence of chronic gastritis with reduced acid output. This is similar to the finding of Nakajima *et al*., from Japan, where they studied 25 patients with chronic renal failure who had not received dialysis and 51 patients receiving dialysis and found that in the nondialysis patients, the prevalence of *H. pylori* positive patients was 56%, while in the dialysis patients, the percentage was 27.5%. They concluded that long-term dialysis decreases the prevalence of *H. pylori*, which may be due to decrease acid output due to chronic gastritis.[12]

Table 3: The seropositivity related to the gender of different study groups

	Control, *n* (%)	HD, *n* (%)	PD, *n* (%)
Female			
Sero-positive	6 (46.2)	9 (52.9)	14 (66.7)
Sero-negative	7 (53.8)	8 (47.1)	7 (33.3)
Compared to control	-	*P*>0.05	*P* >0.05
Male			
Seropositive	5 (41.7)	16 (64.0)	15 (55.6)
Seronegative	7 (58.3)	9 (36.0)	12 (44.4)
Compared to control	-	*P* >0.05	*P* >0.05

Not significant. HD: Hemodialysis, PD: Peritoneal dialysis

Table 4: The seropositivity by epigastric pain

	Control, *n* (%)	HD, *n* (%)	PD, *n* (%)
With epigastric pain			
Seropositive	11 (44.0)	10 (55.6)	16 (66.7)
Seronegative	14 (56.0)	8 (44.4)	8 (33.3)
Compared to control, *P*	-	>0.05	>0.05
Without epigastric pain			
Seropositive	-	15 (62.5)	13 (54.2)
Seronegative	-	9 (37.5)	11 (45.8)
Compared to control, *P*	-	>0.05	>0.05

Not significant. HD: Hemodialysis, PD: Peritoneal dialysis

Table 5: The seropositivity by epigastric pain duration

	Control, *n* (%)	HD, *n* (%)	PD, *n* (%)
<10 years			
Seropositive	7 (33.3)	7 (53.8)	14 (73.7)
Seronegative	14 (66.7)	6 (46.2)	5 (26.3)
P		>0.05	<0.01*
>10 years			
Seropositive	4 (100)	3 (60.0)	2 (40.0)
Seronegative	-	2 (40.0)	3 (60.0)
P		>0.05	>0.05

*Significant difference. HD: Hemodialysis, PD: Peritoneal dialysis

Conclusions

H. pylori serpositivity of patients with chronic renal failure was similar to that of the control. There is no relation between dyspepsia and *H. pylori* serpositivity. Long-term dialysis is associated with a decreased prevalence of *H. pylori*.

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Conflicts of interest

There are no conflicts of interest.

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