

Helicobacter pylori prevalence and its association with endoscopic findings in renal transplant candidates

Böbrek nakli alıcı adaylarında *Helicobacter pylori* prevalansı ve endoskopik bulgularla ilişkisi

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Background and Aims: *Helicobacter pylori* infection is closely associated with the development of peptic ulcers, gastric cancer and gastric MALT lymphoma. Its prevalence is high in patients with normal renal function in Turkey and is thought to be one of the major risk factors for gastrointestinal symptoms. It is unclear however, whether *Helicobacter pylori* infection is directly associated with gastrointestinal mucosal lesions in patients with chronic renal failure. **Materials and Methods:** The aim of this study was to evaluate the endoscopic findings of renal transplant candidates and to assess the prevalence of *Helicobacter pylori* infection. We retrospectively analysed the data of 64 renal transplant candidates' endoscopies and antrum biopsy results for *Helicobacter pylori* infection. **Results:** Sixty-one patients were included in the study. Forty-one (64%) patients were male and 23 (36%) female; at the time of endoscopy mean patient age was 44.7±13.0 (range, 18-67); mean duration of dialysis was 43.0±42.7 (range, 6-189) months; 5 (8%) patients had gastric or duodenal ulcers; 55 (86%) patients had gastritis; 1(1.8%) patient had esophagitis; and 8 (13%) patients had normal endoscopic findings. Endoscopic antral biopsy revealed that 9 (14%) patients were *Helicobacter pylori* positive, whereas 55 (86%) patients were *Helicobacter pylori* negative. Among the endoscopic findings, only peptic ulcer was closely associated with *Helicobacter pylori* infection. There was no correlation between dialysis type or duration and the presence of *Helicobacter pylori* infection. **Conclusions:** Renal transplant candidates have significantly lower *Helicobacter pylori* prevalence than the normal population. *Helicobacter pylori* infection is closely associated with the presence of peptic ulcers in renal transplant candidates. There are factors other than *Helicobacter pylori* infection associated with esophagogastroduodenal lesions in patients with chronic renal failure.

Key words: *Helicobacter pylori*, chronic renal failure, renal transplantation

Giriş ve amaç: *Helicobacter pylori* enfeksiyonu peptik ülser, gastrik kanser ve gastrik MALT lenfoma ile yakın ilişkilendirilmiştir. Türkiye'de normal böbrek fonksiyonu olan hastalarda *Helicobacter pylori* prevalansı yüksek olup *Helicobacter pylori* enfeksiyonu üst gastrointestinal sistem bulguları olan hastalarda majör risk faktörü olarak düşünülmektedir. Buna rağmen kronik böbrek yetmezlikli hastalarda *Helicobacter pylori*'nin gastrointestinal mukozal lezyonlarla ilişkisi net olarak bilinmemektedir. Bu çalışmanın amacı böbrek nakli alıcı adaylarındaki endoskopik bulguları değerlendirmek, bu hastalardaki *Helicobacter pylori* prevalansını saptamak ve endoskopik bulgularla *Helicobacter pylori* prevalansı arasında ilişki olup olmadığını belirlemektir. **Gereç ve Yöntem:** Bu amaçla hastanemizde böbrek nakli yapılmış olan 64 hastanın nakilden hemen önceki hazırlık aşamasında yapılan endoskopik bulguları, endoskopik antrum biyopsilerinde hızlı üreaz testi ile saptanan *Helicobacter pylori* sıklığı analiz edilmiştir. **Bulgular:** Çalışmaya 64 hasta alınmıştır. Hastaların 41'i (%64) erkek ve 23'ü (%36) kadın hasta idi, hastaların yaş ortalaması 44.7±13.0 (18-67) olup, ortalama diyaliz süreleri 43,0±42,7 (6-189) ay idi, endoskopide 5 (%8) hastada gastrik veya duodenal ülser, 55 (%86) hastada gastrit, 1(%1.8) hastada özofajit, 8 (13%) hastada ise normal endoskopik bulgular izlenmiştir. Endoskopik antral biyopsilerde 9 (%14) hastada *Helicobacter pylori* pozitif, buna karşın 55 (%86) hastada *Helicobacter pylori* negatif saptanmıştır. Endoskopik bulgular arasında sadece gastrik veya duodenal ülser varlığı *Helicobacter pylori* enfeksiyonu ile istatistiksel olarak anlamlı olarak ilişkilendirilmiş diğer endoskopik bulgular ise *Helicobacter pylori* enfeksiyonu olan ve olmayan hastalarda benzer oranlarda görülmüştür. Diyaliz tipi ve diyaliz sürelerinin *Helicobacter pylori* varlığı ile ilişkisi bulunamamıştır. **Sonuç:** Böbrek nakli alıcı adaylarındaki *Helicobacter pylori* prevalansı normal topluma göre belirgin oranda düşüktür. *Helicobacter pylori* enfeksiyonu endoskopide yalnızca peptik ülser varlığı ile yakın ilişkilendirilmiş olup peptik ülser dışı endoskopik bulgular *Helicobacter pylori* dışı faktörler ile ilişkilendirilebilir.

Anahtar kelimeler: *Helicobacter pylori*, kronik böbrek yetmezliği, böbrek nakli

INTRODUCTION

Helicobacter pylori (*H. pylori*) is the most abundant human pathogen, infecting an estimated 50% of the global population. *H. pylori* infection is closely associated with gastrointestinal diseases such as peptic ulcer disease, gastric hyperplastic polyps, gastric adenoma, gastric cancer,

and gastric mucosa associated lymphoid tissue lymphoma. The overall *H. pylori* prevalence in Turkey is 82.5% in adults over 18 years old (1). Gastrointestinal symptoms are frequent in patients with chronic renal failure (CRF) (2), and include nausea, dyspepsia, appetite loss, epigas-

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tric discomfort, and heartburn. These symptoms not only decrease the quality of life in patients but negatively impacts nutrition status, contributing to the development of malnutrition, a potent predictor of morbidity and mortality. As a part of the renal transplantation preparatory schedule, upper gastrointestinal endoscopy is done to detect esophagogastroduodenal mucosal lesions before transplantation in our hospital.

The aim of this study was to evaluate the endoscopic findings of renal transplant candidates and to assess the prevalence of *H. pylori* infection in those patients.

MATERIALS and METHODS

We retrospectively analysed the data of 64 renal transplanted patients' endoscopic findings and antrum pathologies for *H. pylori* infection. Patients who were previously on maintenance hemodialysis (HD), or peritoneal dialysis and were renal transplant candidates were included in this study. All patients underwent an esophagogastroduodenoscopy (EGD) before renal transplantation as part of the transplantation preparatory schedule and the endoscopic findings were noted. Following on overnight fast, patients were prepared by topical anesthesia with lidocaine and intravenous midazolam and propofol. Under EGD, all gastrointestinal lesions were recorded and an antral mucosal biopsy was taken with biopsy forceps for a fast urease test for *H. pylori* using 1 mL of freshly prepared 3.9% urea solution (Harnstoff Bouillon Urea Broth). A patient was considered *H. pylori* positive if the expected color change occurred within 24 hours. This study was a single center study in an academic hospital, performed in accordance with Good Clinical Practice and the declaration of Helsinki.

Statistical analysis

For statistical analysis, SPSS 15.0 for Windows was used. Descriptive statistics and categorical variables were expressed as number and percentile; mean numeric variables were expressed as mean \pm standard deviation (SD). Mann Whitney U test was used for the comparison between the two groups. The difference between the categorical variables was tested with χ^2 (chi-square test) test. A *P* value <0.05 was considered statistically significant.

RESULTS

Sixty-four patients were included in the study. Forty-one (64%) patients were male and 23 (36%) were female; mean patient age was 44.7 ± 13.0 (range, 18-67); demographic information is shown in Table 1. Endoscopic findings are shown in Table 2. Some of the patients had

more than one endoscopic finding on EGD. Of the 64 patients, antral biopsies revealed that 9 (14%) patients were *H. pylori* positive, whereas 55 (86%) patients were *H. pylori* negative. When we compared patients with and without *H. pylori* infection in regard to age, sex, dialysis duration and dialysis type, there were no differences between the two groups. In comparing endoscopic findings, peptic ulcer was seen more in patients with *H. pylori* infection than in patients without *H. pylori* infection, 33% versus 3.6%. The difference was statistically significant ($p < 0.017$) (Table 3). The other endoscopic findings were similar in both groups. There was also no statistically significant difference in endoscopic findings between hemodialysis patients or peritoneal dialysis patients (Table 4).

Tablo 1. Demographic findings of renal transplant candidates

Age (year) Mean \pm SD (min-max)	44,7 \pm 13,0 (18-67)	
Sex (%)	Female	23 (35,9)
	Male	41 (64,1)
Dialysis type (%)	HD**	56 (87,5)
	PD**	8 (12,5)
Dialysis duration (month) Mean \pm SD (min-max)	43,0 \pm 42,7 (6-189)	

PD**: Periton dialysis. HD**: Hemodialysis.

Tablo 2. Endoscopic findings of renal transplant candidates

	n (%)
Hiatal hernia	6 (9,4)
Esophagitis	1 (1,6)
Peptic ulcer	5 (7,8)
Gastritis	55 (85,9)
Normal endoscopic findings	8 (13%)
<i>Helicobacter pylori</i> infection	9 (14,1)

DISCUSSION

Dyspeptic symptoms are common in patients with CRF who undergo maintenance dialysis. In the general population it is accepted that *H. pylori* plays an important role in the pathogenesis of chronic gastritis and gastric ulcers. While the prevalence of gastroduodenal mucosal lesions in patients with CRF has been shown to be equivalent to or higher than that seen in healthy patients (3,4), there is conflicting data for the prevalence of *H. pylori* infection in patients receiving chronic ambulatory peritoneal dialysis, chronic hemodialysis and renal transplantation (5-9).

Table 3. Comparison of patients with and without *Helicobacter pylori* infection

		<i>Helicobacter pylori</i>		p
		Absent	Present	
Age		44,8±12,9	44,1±14,5	0,884
Sex (%)	Female	21 (38,2)	2 (22,2)	0,470
	Male	34 (61,8)	7 (77,8)	
Dialysis type (%)	PD**	8 (14,5)	0 (0,0)	0,587
	HD**	47 (85,5)	9 (100)	
Dialysis duration (month)		46,4±45,0	22,4±13,2	0,108
Hiatal hernia		4 (7,3)	2 (22,2)	0,196
Esophagitis		1 (1,8)	0 (0,0)	1,000
Peptic ulcer		2 (3,6)	3 (33,3)	0,017
Gastritis		46 (83,6)	9 (100)	0,337

PD**: Periton dialysis. HD**: Hemodialysis.

Table 4. Comparison of renal transplant candidates according to the dialysis type

	Dialysis Type		P
	PD**	HD**	
Hiatal hernia	1 (12,5)	5 (8,9)	0,567
Esophagitis	0 (0,0)	1 (1,8)	1,000
Peptic ulcer	0 (0,0)	5 (8,9)	1,000
Gastritis	6 (75,0)	49 (87,5)	0,312

PD**: Periton dialysis. HD**: Hemodialysis.

H. pylori is a gram negative spiral flagellate bacillus that usually resides in the gastric mucosa and can cause chronic active gastritis and peptic ulcer disease. The reported frequency of anti-*H. pylori* antibody in patients with renal failure ranges from 21-64% (10-13).

In our study, the rate of *H. pylori* infection was found to be lower in patients with CRF than in patients with normal renal function (1), similar to results found in the literature. Although nearly 90% of the patients had some esophago-gastroduodenal mucosal lesions, only 14 % had *H. pylori* infection, suggesting factors other than *H. pylori* such as hypergastrinemia or hyperammonemia are related to mucosal lesion pathogenesis. The lower *H. pylori* infection rates suggests to us that the eradication of *H. pylori* with time in patients with CRF is probably due to the previous use of antibiotics. We studied the effect of the duration of dialysis with the presence of *H. pylori* infection in our patients but there was no correlation. The only factor associated with *H. pylori* infection was the presence of peptic ulcer on EGD; in these cases, we suggest the investigation of *H. pylori* infection in renal transplant candidates. The difference in our study compared to other reports was the diagnosis of *H. pylori* infection with endoscopic biopsy and the use of the fast urease test instead of serum an-

tibody titer, which can remain elevated despite transient decreases in the bacterial load even for long periods after the disappearance of *H. pylori* (14).

It has been reported that urea concentrations of six mmol/L or higher can inhibit the growth of *H. pylori* (15); thus the high levels of urea nitrogen and gastric juice urea reported in patients receiving dialysis may possibly inhibit the growth of *H. pylori*. In a study conducted by Sugimoto et al (16), *H. pylori* prevalence (with serological test) was found at 48.6%, which was significantly lower than the prevalence of 78.5% seen in patients with normal renal function. They also found that mean duration of dialysis treatment was significantly shorter in *H. pylori* positive patients than *H. pylori* negative patients. The authors attributed the low prevalence of *H. pylori* infection in dialysis patients to high urea levels that inhibited *H. pylori* growth in the stomach – the high levels of proinflammatory cytokines in dialysis patients causing the progress of gastric atrophy, increasing the pH, and likely eradicating *H. pylori* via the use of antibiotic in chronic dialysis patients during the initial treatments.

In another study from Japan conducted by Moriyama et al (17), *H. pylori* prevalence in hemodialysis patients was found at 40% and authors had compared the esophago-gastroduodenal mucosal lesions between patients with and without *H. pylori* infection. They found that gastric erosions increased as the patients become *H. pylori* negative and reflux esophagitis increased in *H. pylori* positive patients. In that study they found no difference in hemodialysis duration between patients with and without esophago-gastroduodenal mucosal lesions. They only found longer hemodialysis duration in patients with reflux esophagitis, suggesting that with *H. pylori* eradication, gastric erosions develop more in patients on hemodialysis due to increase in gastric acid secretion; they concluded that

H. pylori infection is protective against esophagogastric mucosal lesions in patients CRF. In a Turkish study, Sezer et al found *H. pylori* infection in 10% of patients with chronic renal failure; they found no association between dialysis duration and *H. pylori* infection (18). Hence, there are conflicting reports about the effect of long term hemodialysis on the prevalence of *H. pylori* infection. Some reports suggest that there is no effect from duration of dialysis on the prevalence of *H. pylori* infection and others suggest that *H. pylori* prevalence decreases with long term dialysis. The explanation for the lower *H. pylori* prevalence in patients on long term hemodialysis is due to the increased prescription of antibiotics and higher serum antibiotic concentration than the normal population, and to aluminum containing anti-acids and uremia, which can change bacterial colonization of the upper gastrointestinal tract (10,18-20).

Gastroduodenal mucosal lesions occur both due to *H. pylori* infection and humoral abnormalities such as hypergastrinemia, hyperammonemia, dysregulation of endocrine

or paracrine peptides (eg. Cholecystokinin, neurotensin, glucagon), and alterations in electrolytes (eg: hypercalcemia) in patients with CRF (21,22). In our study, comparing patients with and without *H. pylori* infection, peptic ulcer were seen more in patients with *H. pylori* infection than patients without *H. pylori* but the other esophagogastric duodenal mucosal lesions were seen in similar rates in both groups, supporting the aforementioned factors with *H. pylori* in the pathogenesis of mucosal lesions.

In conclusion, although nearly 90% of the renal transplant candidates had some esophagogastric duodenal mucosal lesions, the prevalence of *H. pylori* infection was lower in patients with CRF than in the normal population, suggesting that there are factors other than *H. pylori* in the pathogenesis of esophagogastric duodenal mucosal lesions. Only peptic ulcer disease is closely associated with *H. pylori* infection in patients with CRF, thus in the presence of peptic ulcer disease, *H. pylori* infection should be investigated and treated.

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