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Helicobacter pylori infection in haemodialysis patients and renal transplant recipients

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Abstract

Background. It is known that *Helicobacter pylori* (Hp) plays an important role in gastritis and peptic ulcer disease in the general population. Although dyspeptic complaints are frequent in haemodialysis (HD) patients and renal transplant recipients, there are few reports regarding the prevalence of Hp and its possible effects on this group of patients. This study was performed to examine the prevalence of Hp infection in patients on regular HD treatment and to detect its role in the pathogenesis of dyspepsia in this group of patients.

Methods. Two hundred and one patients with dyspeptic complaints were included in the study. The groups consisted of 47 HD, 54 renal transplant recipients, and 100 non-renal disease patients. Upper gastrointestinal endoscopies were performed and gastric antral biopsies were obtained for urease test in all patients.

Results. Twenty-eight (60%) of the 47 HD and 38 (70%) of the 54 RTR were positive for Hp. Sixty-four (64%) of the 100 patients with various gastrointestinal complaints and known to have no renal dysfunction were positive for Hp. The Hp prevalences among the three groups were not significantly different ($P > 0.05$). The prevalence of Hp infection did not correlate with the haemodialysis duration nor the post-transplantation duration ($P > 0.05$). There was no correlation between the prevalence of Hp infection and duration of haemodialysis therapy or time post-transplantation.

Conclusion. These findings suggest that HD patients are not protected against Hp infection as the Hp prevalences are as high as that for the non-renal disease group. The increased dyspeptic complaints may be partly related to Hp infection.

Key words: *Helicobacter pylori*; haemodialysis patients; renal transplantation; gastrointestinal complaints

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Introduction

Today, *Helicobacter pylori* (Hp) is accepted as a causal factor of gastritis and peptic ulcer disease [1,2]. Gastrointestinal complaints are frequent in chronic renal failure patients on haemodialysis (HD) treatment and renal transplant recipients (RTR) [3]. Peptic ulcer prevalence has been reported to be as high as 22% in RTR [4].

Although upper gastrointestinal diseases and their complications are frequent in HD patients and RTR, only a few reports are available on the prevalence of Hp and its influence on dyspepsia. In a recent study from Germany, the prevalence of Hp was significantly lower in chronic uraemia patients than in non-uraemics. The authors concluded that uraemic patients seemed to be protected against Hp [5]. In other studies, however, the Hp prevalence was found to be higher (50–58%) [6,7]. Kashiwaga *et al*. found that Hp-positive subjects accounted for inuremic HD patients, but only 23.5% of the RTR were Hp positive [7].

The aim of the present study was to evaluate the prevalence of Hp positivity in HD patients and in RTR to evaluate its possible role in upper gastrointestinal complaints in these special groups of patients.

Subjects and methods

Two hundred and one patients with upper gastrointestinal complaints were included in this study. Patients who had taken antibiotics within 4 weeks were excluded from the study. The patients were grouped as follows: group 1, 47 HD patients; group 2, 54 RTR; and group 3, 100 non-renal disease (NRD) patients. Mean age and male/female ratios are shown in Table 1. Mean HD duration time for group 1 was 28.87 ± 28.92 months and mean post-transplantation time for group 2 was 50.7 ± 39.8 months (Table 1).

Upper gastrointestinal endoscopies were performed in all patients with Olympus GIF Q 230 videofibrescope and biopsies were obtained with Olympus FB 26 N biopsy forceps (Olympus KeyMed, UK). An antral mucosal biopsy was taken with sterile biopsy forceps from each patient for the detection of Hp by urease test. Freshly prepared 1 ml of 3.9% urea solution (Harnstoff Bouilcon Urea Broth) was used for the urease test. Hp was considered positive if the expected colour change occurred within 24 h.

The endoscope and the biopsy forceps were disinfected

Table 1. Demographical characteristics of patients

	Haemodialysis patients	Renal transplant recipients	Control group
Patients (*n*)	47	54	100
Mean age (years)	37.27 ± 14.08	37.7 ± 10.1	40.51 ± 13.60
Mean haemodialysis duration (months)	28.87 ± 28.92	–	–
Mean post-transplantation duration (months)	–	50.7 ± 39.8	–

using 2% gluteraldehyde with an automated disinfector (Auto-Disinfector 3, Olympus KeyMed, UK).

The demographic and clinical data were compared with Student's *t* and chi-squared tests.

Results

The mean age of the three groups and male/female ratios showed no statistical differences ($P > 0.05$).

The most frequent finding in RTR and NRD patient groups was gastritis (65 and 43% respectively). In contrast, gastritis was quite rare in the HD group (19%). Duodenitis was the most frequent finding in the HD group (38%). Duodenitis prevalence in the other two groups was similar (13 and 12%). Peptic ulcer rates were 8% in the HD group, 4% in the RTR group, and 22% in the NRD group.

Hp was present in 28 of the 47 HD patients (60%), 38 of the 54 RTR patients (70%), and 64 of the 100 NRD patients (64%). The differences between these groups were not significant ($P > 0.05$).

The endoscopic findings and Hp status of the groups are shown in Tables 2 and 3.

HD duration and post-transplantation time did not affect the Hp status in the HD and RTR groups ($P > 0.05$) (Table 4).

Discussion

Most HD patients and RTR suffer from gastrointestinal complaints. Peptic ulcer prevalence in HD patients is comparable with that in the general population. However, the frequency of peptic ulcer and its related complications, increases after renal transplantation [8]. In a study from Spain, 79 gastrointestinal complications in 480 RTR were reported. The most frequent complication was upper gastrointestinal bleeding (2.9%). Gastritis, oesophagitis and peptic ulcer were other common complications. Interestingly, 67% of the peptic ulcer patients developed bleeding, which is a much higher incidence than that observed in the general population [9]. In two recently published articles, it was clearly demonstrated that Hp eradication reduced the reoccurrence of bleeding in peptic ulcers [10,11].

A close relationship exists between the presence of Hp and gastritis and peptic ulcer disease [1]. Although gastrointestinal complaints are very frequent in HD patients and RTR, there are few reports on Hp prevalence in these patient groups. However, in a study by Teenan *et al.*, no relationship between Hp colonization ans cyclosporine or prednisolone levels were observed [12]. One might expect a high Hp prevalence among renal transplant recipients secondary to immunosuppressive therapy. In our study, Hp prevalence among renal transplant recipients was 70%. Teenan *et al.* and Davenport *et al.* reported 48 and 29% respectively [12,13].

Pretransplantation risk factors for subsequent development of peptic ulcer remain to be identified and

Table 3. Hp prevalence in each group

	Hp (+) (%)	Hp (–) (%)	Total
Group 1 (HD)	28 (60)	19 (40)	47
Group 2 (RTR)	38 (70)	16 (30)	54
Group 3 (NRD)	64 (64)	36 (36)	100

Table 4. Relationship of Hp prevalence with duration of time post-renal transplantation and with duration of haemodialysis therapy

	Hp (+)	Hp (–)	*P*
Duration after renal transplantation (months)	54.52 ± 38.57	41.87 ± 42.83	0.1458 ($P > 0.05$)
Duration of dialysis in haemodialysis patients (months)	25.39 ± 21.69	29.57 ± 34.14	0.3052 ($P > 0.05$)

Table 2. Endoscopic findings in each group

	Group 1		Group 2		Group 3	
	(HD) *n*:47	(%)	(RTR) *n*:54	(%)	(NRD) *n*:100	(%)
Gastritis	9	(19)	35	(65)	43	(43)
Gastric ulcer	1	(2)	–	–	–	–
Duodenitis	18	(38)	7	(13)	12	(12)
Duodenal ulcer	3	(6)	2	(4)	22	(22)
Oesophagitis	1	(2)	2	(4)	–	–
Oesophageal varices	1	(2)	–	–	–	–
Hiatus hernia	–	–	–	–	4	(4)
Normal	16	(34)	17	(31)	22	(22)

should be managed properly. Although there are few reports on the prevalence of Hp in the HD population and the role of Hp infection, there are some clues indicating an increase in Hp prevalence among patients undergoing haemodialysis treatment [6,14]. However, Jaspersen *et al.* found that Hp prevalence among haemodialysis patients was significantly lower than in the healthy population [5]. In our study the Hp prevalence was rather high, but very similar to non-renal disease patients (60 *vs* 64%, $P > 0.05$).

In North America and other developed countries, Hp infection is rare before the third decade. After this time, the rate of Hp rises, and over 50 years of age the seropositivity rate reaches approximately 40–60%. In developing countries, Hp positivity in the first decade reaches 50% or more. After 50 years of age this rate becomes almost 100%. Socioeconomic status and ethnic groups play important roles in Hp frequency [15,16].

There are various epidemiological studies regarding Hp infection in Turkey. Özden *et al.* found Hp positivity to be 81% in the general population [17]. This rate is similar to values in developing countries. In Özden's study, Hp frequency among the 7–11, 13–18, and 19–24 age groups were 79, 83 and 75% respectively. This rate was 94% in the 40–65 age group. It seems that there is a positive correlation between Hp frequency and age [17].

In this study we could find no significant differences between the HD, RTR and NRD groups with respect to Hp frequency. Prevalence rates found in our HD and RTR are in close proximity to the values found in epidemiological studies performed in our country. The prevalence rates reported in Turkey may be due to environmental factors and unsolved sanitation problems.

In conclusion, Hp prevalence was high in all three groups. It seems that haemodialysis patients and renal transplant recipients are not protected against *Helicobacter pylori* infection. The increased rate of gastrointestinal complaints in haemodialysis patients and in renal transplant recipients may be partly due to increased *Helicobacter pylori* infection rate.

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