

UPPER GASTROINTESTINAL TRACT EVALUATION IN CHILDREN WITH END STAGE RENAL FAILURE

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Gazi Medical Journal 1999; 10 : 106-109

SUMMARY

Purpose : Gastrointestinal system involvement is common in uremic patients. The aims of this study were to determine the gastrointestinal symptoms and to investigate the frequency of esophagitis, gastritis, peptic ulceration and *Helicobacter pylori* (HP) infection in children with end stage renal failure (ESRF).
Methods : Seven girls and 10 boys (8-19 years of age, mean, 13.6±3.4 years) were investigated. Three of these children had symptoms of dyspepsia. Twenty-eight age-matched children who had no symptoms of dyspepsia served as controls. **Results :** Nine patients in the ESRF group had endoscopic findings such as antral erythema and nodularity (%52.9). In the control group, six children had antral erythema and nodularity (21.4%) ($p<0.01$). None in either group had esophagitis or peptic ulceration. HP positive antral gastritis by culture and/or histopathology was present in 8 patients in ESRF group (47%) as compared to 15 children in the control group (58%). **Conclusion :** Children with ESRF showed a similar prevalence of esophagitis, peptic ulceration and HP positive gastritis as compared to the control group, suggesting that uremia is not a risk factor for HP colonization in childhood.

Key Words : Adolescence, Endoscopy, Kidney Failure, Duodenal Diseases, *Helicobacter Pylori*.

INTRODUCTION

Gastrointestinal system involvement, such as esophagitis, gastritis, duodenitis and peptic ulcer disease, are frequent complications of end stage renal failure (ESRF) in adults (1-3). It has been well established that gastric *Helicobacter pylori* (HP) infection is the major pathogenetic factor for gastritis and peptic ulcer disease in the general population. It has also been suggested

that this microorganism may play a role in the pathogenesis of some of the gastrointestinal manifestations in ESRF (4, 5).

The object of the present study was to evaluate a sample of children with ESRF with respect to gastrointestinal symptoms, endoscopic and histological findings. In addition, we aimed to determine the frequency of esophagitis, gastritis, peptic ulceration and HP infection in this group of patients. The patients were

compared with a sample of children who were referred to endoscopy for reasons other than dyspepsia or abdominal pain.

MATERIAL AND METHODS

Patients: Seven girls and 10 boys (8-19 years old; mean 13.6 ± 3.4 years) with ESRF (3 predialysis, 12 on continuous ambulatory peritoneal dialysis and 2 on continuous cyclic peritoneal dialysis program) were studied. The primary diagnosis of the patients were as follows: pyelonephritis and congenital abnormalities (7), membranoproliferative glomerulonephritis (3), systemic lupus erythematosus (1), amyloidosis (1), cystinosis (1), juvenile nephronophthisis (1), Alport syndrome (1), unknown (2). All patients were questioned whether they had any dyspeptic symptoms such as nausea, vomiting, heartburn, early satiety or epigastric pain. Patients on acid-suppressive or on antibiotic therapy were excluded. Informed consent was obtained from the patients and/or parents.

Controls: Eight girls and 20 boys (5-18 years old; mean 11.0 ± 3.0 years) served as controls. These patients were referred to endoscopy either to evaluate portal hypertension or celiac disease. None had symptoms of dyspepsia.

Endoscopy and biopsies: Esophagogastroduodenoscopy was performed under local anesthesia or intravenous midazolam, after an overnight fast, using an Olympus GIFP30 gastroscope. Endoscopic appearances, such as erythema, exudation, petechia, nodularity, friability, erosions or ulceration were recorded. Multiple biopsies were taken from antrum and corpus of the stomach.

Histological evaluation: Formalin fixed gastric biopsies were stained with H&E and sent for histopathological examination and HP identification.

Microbiological evaluation: Culture of the gastric biopsy specimens was performed on selective blood agar plates (no 2 Columbia agar, Oxoid Ltd, London, England), supplemented with horse blood, 5% by volume and Skirrow supplement; Oxoid) under microaerophilic conditions. Gram negative, oxidase, catalase and urease positive spiral, curved rods were identified as HP. HP infection was regarded as

positive if results of culture and/or histopathological assessment were positive.

Statistics: Data were expressed as mean \pm standard deviation where appropriate. Chi square analysis was used to compare values of patients and controls. A p value <0.05 was considered as significant.

RESULTS

Three patients in the ESRF group had symptomatic dyspepsia (epigastric pain or occasional nausea and vomiting). Nine patients in the same group had endoscopic findings such as antral erythema and nodularity (52.9%). None had esophagitis or peptic ulceration. Six children in the control group had antral erythema and nodularity (21.4%). None had esophagitis or peptic ulceration. Antral gastritis was reported histopathologically in 10 patients in the ESRF group (58.8%), and in five of them HP was identified. In the control group, antral gastritis and HP were present histopathologically in 15 patients (53%). Microbiologic assessment of the gastric biopsy specimens revealed that HP was positive in seven children in the ESRF group (41.1%) while it was positive in 10 children in the control group (35.7%). Overall, HP infection, defined as HP positivity by histopathological and/or microbiological assessment, was determined in eight patients in the ESRF group (47%), and in 15 patients in the control group (53%). The difference between the patients and the control group was not statistically significant. Antral gastritis was documented histopathologically in all cases in whom HP was identified either by microbiology or histopathology. Only two of the eight patients with ESRF who had HP positive antral gastritis were found to have symptoms of dyspepsia.

Endoscopic, histopathological and microbiological findings of the patient and the control groups are shown in table 1.

DISCUSSION

Gastrointestinal symptoms and various types of gastrointestinal system involvement are relatively common in adult patients with ESRF (1). It has been shown in a number of studies that esophagitis, delay in gastric emptying, gastritis, duodenitis, and peptic ulcer can be found in these patients (1, 3, 5, 6).

Table 1: Endoscopic, histologic and microbiologic findings of the patient and the control groups.

	Patients		Control	
	(n:17)	(%)	(n:28)	(%)
Endoscopic findings				
esophagitis	none	-	none	-
antral erythema/nodularity	9	52.9	6	21.4
peptic ulceration	none	-	none	-
Histologic findings				
antral gastritis	10	58.8	15	53
Helicobacter pylori	5	29.4	15	53
Microbiologic findings				
Helicobacter pylori culture	7	41.1	10	35.7
Overall Helicobacter pylori infection	8	47	15	53

It has been reported that 18% to 77% of adult patients with chronic renal failure had symptoms of GI disturbance (5,7). The high prevalence of GI complaints were mainly reported in patients undergoing haemodialysis, and it has been documented that as the duration of dialysis increases, the number of patients with GI symptoms also increases (5,8). In the present study, we found that symptoms of dyspepsia were not a major concern in children with ESRF (17.5%). Children in our study group were not on haemodialysis program, and this might have an influence on their GI symptomatology. In addition, the low prevalence of the GI complaints in our group might be both due to their relatively younger age compared to adults and also due to our small sample size.

Endoscopic observations in our study differed between the patient group and the controls although esophagitis and peptic ulceration were not seen in either of the groups. Endoscopic findings such as antral erythema and nodularity were significantly higher in the ESRF group, compared to the control group (52.9% and 21.4%, respectively; $p < 0.01$). Endoscopic studies in asymptomatic uremic adults also showed a much greater prevalence of gastroduodenal pathology, compared to normal subjects (6).

Current evidence strongly suggests that gastric HP infection is the major pathogenic factor for gastritis and peptic ulcer disease in the general population. Successful eradication of HP has been shown to reduce the risk of peptic ulcer recurrence dramatically (9,10). It has been suggested that this microorganism may play a role in the pathogenesis of some of the GI manifestations in ESRF (4,5). This is thought to be due to the increased gastric urea

concentrations in patients with renal failure and high urease activity of the bacterium, converting urea to ammonia, which provides protection against the low pH of the gastric lumen (7,11). Indeed, some studies have shown a high prevalence of HP in uremic adults (12,13). In contrast, it has also been reported that there is no difference in the prevalence of HP in ESRF and control group (5,7,14). In the present study, children with ESRF showed a similar prevalence of HP infection to the control group, suggesting that uremia is not a further risk factor for HP colonization. HP infection is generally acquired early in childhood (15). Most infected individuals do not develop symptoms, although antral gastritis has been reported to be present in all infected subjects (16). In our study, a strong correlation between the presence of antral gastritis and HP colonization was also encountered. HP infection and antral gastritis due to this microorganism in our series of children with ESRF seem to show the same epidemiological pattern as that found in our control group of children. In conclusion, the suggestion that HP can play an important role in the pathogenesis of frequent gastroduodenal disease in uremic patients was not confirmed by our study.

Moorthy and Chesney first drew attention to uremic children for the possibility of increased prevalence of peptic ulcer disease in this patient population (17). They have reported two children with peptic ulcers among 23 children in a period of four years' observation. However, we have not seen peptic ulcer endoscopically in our children with ESRF. This may be both due to a small sample size and also due to our cross sectional study design. Nevertheless, we believe that these patients must be followed up with respect to

gastrointestinal symptoms.

In summary, we recommend that children with ESRF, either symptomatic or asymptomatic, should be endoscopically evaluated periodically, especially before renal transplantation procedure. Patients with HP positive antral gastritis should be medically treated so as to avoid peptic ulcer disease, which could lead to life threatening haemorrhage.

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