Endoscopic Findings and Helicobacter pylori in Children on Long-Term Hemodialysis

Fakhroosadat Mortazavi and Mandana Rafiey
Department of Pediatric Nephrology,
Department of Pediatric Gastroenterology, Faculty of Medicine,
Liver and Gastroenterology Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

Abstract: The aim of this study is to evaluate the prevalence of GI symptoms, endoscopic abnormalities, histologic gastritis and Helicobacter pylori infection in children with End Stage Renal Disease (ESRD) undergoing maintenance hemodialysis. Upper endoscopy and gastric biopsy were performed in 31 consecutive ESRD children from 2002-2007, before renal transplantation. H. pylori status was determined by urease test and histology. The mean age of patients was 11±3.3 years (4-16 year). The mean duration of dialysis was 12.4±11 months (1.5-54 months). Seventeen patients (54.8%) were symptomatic. Twenty patients (64.5%) had endoscopic abnormalities. Antral erythema, esophagitis, antral nodularity and diffuse gastritis were common endoscopic findings. Endoscopic abnormalities were more common in symptomatic patients than asymptomatic patients (p<0.05). Twenty patients (64.5%) were H. pylori positive. There was no statistical correlation between age, sex, serum creatinine level, presence of any symptoms and endoscopic abnormalities with H. pylori positivity. The mean duration of dialysis in H. pylori negative patients was significantly longer in comparison with H. pylori positive patients. High prevalence of endoscopic abnormalities and H. pylori infection in both symptomatic and asymptomatic patients emphasize the necessity of upper GI evaluation in ESRD children before renal transplantation.

Key words: End stage renal failure, Helicobacter pylori, gastroduodenal lesions

INTRODUCTION

Gastrointestinal (GI) disorders are common in patients with end stage renal disease (ESRD). Upper endoscopy in stable adult dialysis patients reveals abnormalities in up to 51%. Gastritis, duodenitis and mucosal erosions are the most common findings (Lew et al., 2001). The pathogenesis of uremic GI lesions is not understood. Multiple factors may be involved in development of GI lesions including uremia, multiple drug taking, dietary restrictions, hypergastrinemia and Helicobacter pylori infection. Current evidences strongly suggest that H. pylori is a major factor in pathogenesis of peptic diseases in general population (Gur et al., 1999). It has been estimated that approximately 60% of the world population is colonized with this organism (Aydemir et al., 2005). It is suggested that increased gastric urea concentration in renal failure and high urea activity of the bacterium, converting urea to ammonia, provides protection against the low pH of the gastric juice (Watanabe et al., 2003). However the relationship between H. pylori and peptic disease in patients with renal failure is not documented. Prevalence of H. pylori in Iranian adult patients with ESRD has been reported as high as 58.8 and 63% (Sotoudemanesh et al., 2003; Khedmat et al., 2007). Although there are many studies on gastroduodenal lesions and H. pylori in adult ESRD patients, data concerning children with ESRD is insufficient. The aim of this study is to assess the prevalence of GI symptoms, endoscopic abnormalities and H. pylori infection in children undergoing maintenance hemodialysis and determine the value of upper GI assessment in children awaiting renal transplantation.

MATERIALS AND METHODS

In this descriptive-analytic study performed from January 2002 to December 2007 in Children's Hospital of Tabriz, all children with ESRD on chronic hemodialysis that waiting for renal transplantation were investigated. A questionnaire was completed for each patient including history of renal disease and GI symptoms. Upper GI endoscopy performed in all patients by an experienced pediatric endoscopist with an Olympus GLF XP20 device, under appropriate sedation. Two gastric antral biopsies were taken for urease test and histologic assessment. Two other samples, one from duodenum and one from esophagus, were taken for histologic examination.

Corresponding Author: Dr. Fakhroosadat Mortazavi, Children's Hospital of Tabriz, Sheshgelen Street Tabriz, Iran
Tel: 0098 411 5262280 Fax: 0098 411 5262279

1840
Formalin fixed biopsy samples were stained with hematoxylin and eosin. Histological examination was done by one pathologist as recommended by Sydney working group report on gastritis (Price, 1991). Helicobacter pylori positivity was defined as the presence of histologically proven micro-organism and positive urease test. Patients who had received antibiotics, nonsteroidal anti-inflammatory drugs, $H_2$ receptor blockers and proton pump inhibitors for 4 weeks prior to endoscopy were excluded. We treated $H. \text{pylori}$ positive patients with omeprazol 20 mg once daily, amoxicillin 50 mg/kg/day and metronidazol 20 mg/kg/day for 14 days. Drug dosages were adjusted for glomerular filtration rate. Urease breath test was performed 2 weeks after termination of treatment to evaluate the eradication of $H. \text{pylori}$. The research ethics committee of Tabriz University of Medical Sciences approved the study and informed consent was obtained from all parents. Statistical analysis was performed using the SPSS 14 software for windows. Chi square and independent t-test were used to compare the groups. Pearson test was used for correlations. p-value less than 0.05 was considered significant.

**RESULTS**

Thirty one children (20 boys and 11 girls) were investigated during 6 years. The mean age of patients was 11±3.5 years (range: 4-16 year). The mean duration of hemodialysis was 12.4±11 months (range: 1.5-54 months). Mean serum creatinine prior to hemodialysis session was 7.2±1.9 mg dL$^{-1}$ (range: 3.9-9.7 mg dL$^{-1}$). Etiology of ESRD has been shown in Table 1. Seventeen patients (54.8%) had GI symptoms (Table 2). Mean age of symptomatic patients (13±2.7 years) was significantly higher than mean age of asymptomatic patients (8.3±3.1 year) (p<0.05). Twenty patients (64.5%) had one or more abnormal endoscopic findings (Table 3). Sixteen of symptomatic patients (16/17 = 94%) had abnormal endoscopic findings while only 4 of asymptomatic patients (4/14 = 29%) had endoscopic abnormalities (p<0.05). Epigastric pain was the most common symptom and antral erythema was the most common endoscopic finding. There was no statistical correlation between the age, sex, duration of dialysis and creatinine level with the presence of endoscopic abnormalities.

$H. \text{pylori}$ was detected in 20 patients (64.5%). There was no significant difference in $H. \text{pylori}$ positivity between symptomatic and asymptomatic patients (70.6% versus 57%) (p>0.05). The mean duration of hemodialysis in $H. \text{pylori}$ negative patients (21.2±13.9 months) was longer than duration of dialysis in $H. \text{pylori}$ positive ones ($7.6±4.9$ months) (p<0.05). Rate of $H. \text{pylori}$ positivity in patients with endoscopic abnormalities (15/20 = 75%) was higher than its rate in patients with normal endoscopy (5/11 = 45.4%), however the difference was not significant (p>0.05). There was no statistical correlation between the age, sex, and creatinine level with $H. \text{pylori}$ positivity.

In histopathologic study, chronic gastritis followed by esophagitis and duodenitis were the most common findings (Table 4). Urea breath test after treatment in $H. \text{pylori}$ positive patients revealed eradication of $H. \text{pylori}$ in 14 (14/20 = 70%) patients. The 6 patients who didn’t respond to first line therapy were treated with clarithromycin and amoxicillin.

**DISCUSSION**

GI symptoms are said to be common in patients with ESRD. Some studies on adults have reported the prevalence of GI symptoms as high as 77 and 79% (Cano et al., 2007). Cano et al. (2007) observed that the frequency of abdominal pain was 70% in uremics, 21% in
medical outpatients and 16% in healthy control group. Emir et al. (2000) studied 37 children with ESRD and showed that 40% of patients had GI symptoms before endoscopy and 80% of symptomatic and 23% of the asymptomatic patients had GI lesions on upper endoscopy. In this study 54.8% of patients were symptomatic and similar to Emir’s study symptomatic patients had significantly higher rate of endoscopic abnormalities than asymptomatic patients. These findings indicate that most GI complaints in children with ESRD have an organic origin. However 29% of our asymptomatic patients also had abnormal findings on endoscopy which if not detected, may increase the risk of post transplant complications.

In most studies in adults and children mucosal erosions are the predominant finding in endoscopy and ulcers are uncommon (Emir et al., 2000). In this study 64.5% of patients had endoscopic abnormalities and mucosal lesions were the most common finding and ulcer was found only in one patient. So the results of endoscopy in this study are similar to other studies.

It has been shown that H. pylori is closely involved in the development of peptic diseases. However there are conflicting reports about its real role in pathogenesis of uremic GI lesions in ESRD patients. In some studies in adults and children there was no difference in the prevalence of H. pylori in ESRD and control group (Abou Saif et al., 2000; Olmos et al., 2003; Al-Mueilo, 2004). Even in some studies on adults the prevalence of H. pylori in dialysis patients was significantly lower than nondialysed CRF patients and normuremic group (Kang et al., 1999; Nakajima et al., 2004; Tsukada et al., 2003). Nardone et al. (2005) observed high frequency of peptic lesions and H. pylori in uremics in comparison with dyspeptic normuremic patients (2005). In this study rate of H. pylori positivity was 64.5%. Although the prevalence of H. pylori positivity in children of our area is not detected, in our recent study on children who underwent upper GI endoscopy for abdominal pain, its rate was 46% (Rafeey et al., 2004). The relatively high incidence of H. pylori in ESRD patients may be due to their low socioeconomic condition. In this study the mean duration of dialysis in H. pylori negative patients was significantly longer than duration of dialysis in H. pylori positive patients. This finding has also been reported by Nakajima et al. (2002). It seems that long term dialysis decreases the prevalence of H. pylori. The reduction of gastric acid secretion related to chronic gastritis, or frequent antibiotic consumption may be involved in this rate reduction. In conclusion this study shows a high frequency of endoscopic abnormalities and H. pylori positivity in both symptomatic and asymptomatic ESRD children. So, clinical symptoms are not adequately reliable for prediction of GI lesions. Pretransplant detection and treatment of upper GI lesions is crucial for prevention of serious complications after transplantation.

ACKNOWLEDGMENT

The authors would like to thank Dr. Babollah Gassemi for the histopathological examination of biopsy samples.

REFERENCES


