The Survey of *Helicobacter pylori* Infection in Infant

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Abstract: This present study was designed to determine the prevalence of *H. pylori* in infants and correlation of this infection with age. In a prospective descriptive study in Tabriz children hospital, we conducted analysis of children within age 2 year or younger who had *H. pylori* infection that were diagnosed with endoscopies and biopsy. Prevalence of infection was higher in the infants whose mothers had a low education level ($p = 0.045$). The *H. pylori* prevalence didn't differ between exclusively breastfeeding to six months and infants who had never breast fed (26.6% vs. 13.3%) ($p = 0.2$). We could not find any correlation between rate of infection and age of patients which used by regression model for analysis and t test ($p = 0.5$). Based on our study the prevalence of *H. pylori* infection in infants living in North West of Iran was low. We could not find any correlation between rate of infection and age of patients.

Key words: *H. pylori*, child, endoscopy, prevalence, age, infection

INTRODUCTION

Infection with *Helicobacter pylori* in the human stomach is highly associated with the gastritis and peptic ulcer disease (Kuipers *et al.*, 1995). The prevalence of *H.* pylori infection varies by ethnic group, geographic area, socioeconomic status and age (Ganga-Zandzou *et al.*, 2009; Moghaddam *et al.*, 2009). The routes of infection with *H. pylori* remain a major debate. In developing countries, the majority of people become infected during childhood. Additionally, variations in age at acquisition of *Helicobacter pylori* can produce different effects in the gastric mucosa, resulting in the development of atrophic gastritis with a high risk of gastric cancer (Blaser *et al.*, 1995). Furthermore the peak age of acquirement of *H. pylori* infection is unclear and it differs between the developed and developing world (Lindkvist *et al.*, 1996). The data on *H. pylori* prevalence are mostly based on serological studies. Serological tests had been reported to be frequently untrustworthy for the diagnosis of *H. pylori* infection in children (Megraud, 2005). The majority reliable method for diagnosing *H. pylori* infection is straight from endoscopic biopsies (Gold *et al.*, 2000).

The *H. pylori* prevalence in childhood reflects the prevalence that will be found in adulthood in a given age group. There is a great contrast between developed countries, where only very few children are infected and developing countries, where most children reach adulthood being *H. pylori* positive (Megraud, 2005). To build up a preventive strategy against *H. pylori* transmission, it is important to understand where and how the infection occurs. This present study was performed to design for estimation of *H. pylori* infection prevalence among infants less than 2 years old.

MATERIALS AND METHODS

We performed a prospective descriptive study of patients under two years old who were referred for upper endoscopy from all regions of northwest of Iran to Tabriz Children Medical Centers in the Tabriz, during 24 months and this research was conducted from 2005 to 2009. All children under 2 years old that needed endoscopy were enrolled in this study. The demographic data, presenting symptoms, endoscopic finding were recorded. Written informed consent was obtained from patient's parents. Exclusion criteria included patients with documented intake of antibiotic or proton pump inhibitor and if biopsy of tissue wasn't performed for any reason. All of children had upper endoscopies with sedation. At least 3 biopsies were routinely taken at antrum, of which 2 were sent for

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histological examination and 1 was sent for rapid urease test, regardless of endoscopic findings.

H. pylori infection was defined by both a positive rapid urease test and antral biopsy for the bacteria. Pathologists reviewed hematoxylin and eosin-stained slides prepared from formalin-fixed, paraffin-embedded gastric biopsy specimens. Analysis was defined according to criteria of Sydney system (Moghaddam *et al.*, 2009; Price, 1991; Oderda *et al.*, 2009).

Descriptive statistics and Chi-squire test were used to review the characteristics of patients. Statistical analysis was performed using STATA 7.0 statistical software (Stata Corporation, College Station, Tex).

RESULTS

We conducted analysis of children age 2 year or younger who were diagnosed by endoscopies and biopsy for *H. pylori* infection. Analysis of the data revealed that, 44 infants (54% boys and 46% girls) fulfilled the criteria and were recruited into study. All children were born in northwest of Iran and had been living there up to now. Their mean age was (7.77+3.51) months with range of 1-12 months. *H. pylori* infections were found in 8 infants (18.2%). There wasn't significant difference in the prevalence of infection between boys and girls ($\chi^2 = 48\%$, p = 1).

Indication for endoscopy were: acute GI bleeding (27.3%), chronic vomiting (40.9%) and other conditions including: foreign body, abdominal pain, esophageal atresia, vomiting 9.1% and malabsorbsion (15.9%) (Table 1). A review of antral biopsy specimens showed that all *H. pylori* infected children had chronic active gastritis. Among patients with negative *H. pylori* infection (36), only 8% had chronic mild inflammation. Reflux esophgitis also was seen in 65.1% of patients.

Prevalence of infection was higher in the infants whose mothers had a low education level (p = 0.045). The prevalence of *H. pylori* infection didn't differ between children with exclusively breastfeeding for more than six months and children who had never breast fed (26.6% vs. 13.3%) (p = 0.2). We could not find any correlation between rate of infection and age of patients based on the regression model and t-test (p = 0.5).

Table 1: Indication for endoscopy

indication	Percentage
Acute GI bleeding	97.3
Chronic vomiting	40.9
Malabsorption	15.9
Foreign body	9.1
Abdominal pain	9.1
Esophageal atresia	9.1
Vomiting	9.1

DISCUSSION

As mentioned in the literature review *H. pylori* has been isolated world wide but it is more frequently recorded from patients in developing countries (Rafeey and Nikvash, 2007; Glassman, 1992; Dler-Shohet *et al.*, 1996). Many studies have described an increasing prevalence of *H. pylori* infection with increasing age in asymptomatic people around the world (Rodrigues *et al.*, 2006; Okuda and Fukuda, 2009; Ertem *et al.*, 2003; Rothenbacher *et al.*, 2002). This present study was designed to determine the prevalence of *H. pylori* infection in infants and correlation of this infection with age of patients.

Transmission of infection may occur in many ways for example: inadequate hygiene such as common use of spoons and pre mastication of children food and level of mother's education (Rodrigues *et al.*, 2006).

Breast feeding has a protective effect against many infective agents. A number of studies had shown a protective effect of breast feeding against acquisition of *H. pylori* infection (Rodrigues *et al.*, 2006). In this study breast feeding had no statistically significant protective effect (p = 0.2) and this finding didn't support the previous research.

Another study suggested that breast feeding didn't protect against *H. pylori* infection and was associated with a tendency to wards increased infection in children with or without breast feeding more than 6 months (Tam *et al.*, 2009).

This increasing risk of *H. pylori* infection could be associated with mother's education but it isn't associated with washing their hands prior to breast feeding or mother's kiss or cleaning their nipples or pacifier with saliva.

In our study 86% of infants whose mother's education was less than high school were infected, compared to 14% of infants with more highly educated mothers. Parental education level has been shown to be inversely correlated with seroprevalence of children (Dler-Shohet *et al.*, 1996).

In a chinese study 6.9% of children under going endoscopies had an ulcer and in half of them (46.5%) *H. pylori* infection was not found (Tam *et al.*, 2009). Although, in this study we had high prevalence of acute gastrointestinal bleeding in patients at presenting time, only one case had erosive gastritis.. In another study, prevalence of *H. pylori* infection in infants was 12.8% and it was 19.4% in toddlers (Kawakami *et al.*, 2008). In the present study, prevalence of *H. pylori* infection in children under 2 years old confirmed by biopsy was low (18.2%). Surprisingly present studies did not show any

correlation between prevalence of infection and increasing age of patients. Our detection of *H. pylori* infection was based on direct methods (Endoscopic biopsy) rather than seroprevalence. serology is an indirect method that has been considered to be recurrently unreliable in children (Gold *et al.*, 2000). Thus, we believe that our study evaluates exactly the occurrence of active *H. pylori* infection in infants less than two years old.

Based on our study the prevalence of *H. pylori* infection in infants living in North West of Iran was low. Further longitudinal studies, especially in developing countries are needed to identify how and when a child becomes infected. Extended information about *H. pylori* acquisition may improve prevention programs.

ACKNOWLEDGMENTS

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