

Change of *Helicobacter pylori* prevalence in a decade among children undergoing endoscopy

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SUMMARY: Yaman A, Kuloğlu Z, Kahveci A, Sayıcı A, Ensari A, Kansu A. Change of *Helicobacter pylori* prevalence in a decade among children undergoing endoscopy. Turk J Pediatr 2016; 58: 579-582.

Our aim was to investigate the trend of *H. pylori* infection among children during the last decade by a retrospective analysis. Reports of children in whom esophago-gastroduodenoscopy was performed at our institution during two periods 2002-2003 and 2012-2013 were separated into Group I and Group II, respectively. Pathology reports were investigated for gastritis, atrophy and *H. pylori* presence.

A total of 380 children, 131 in Group I and 249 in Group II were recruited in the study. *H. pylori* positivity was found to be higher in Group I (% 48.1 and % 23.1, respectively, $p < 0.001$). Gastritis and atrophy were associated with *H. pylori* and both were more prevalent in Group I ($p < 0.001$). Our study demonstrates that *H. pylori* prevalence is decreasing in a pediatric population undergoing EGD in Ankara. This is the most recent study regarding pediatric *H. pylori* prevalence change in Turkey that we know of.

Key words: *H. pylori* prevalence, children, endoscopy.

Helicobacter pylori infection is still one of the most common human infections. It is estimated that by mid adulthood 40%-80% of the population is infected worldwide where the prevalence in developing countries tends to be higher¹. Prevalence exceeding 85% may be seen among young adult populations living in underdeveloped countries². In a recent nationwide epidemiological study in Turkey among adults, *H. pylori* prevalence was 82.5%³. Most recent *H. pylori* prevalence study involving Turkish children have reported a prevalence of 49%⁴.

Decrease in *H. Pylori* prevalence over decades is a uniform finding worldwide⁵⁻⁸. Two European studies from The Netherlands and Finland found *H. pylori* prevalence decreasing from 50% to 20% and 31%, respectively. Less developed countries like Greece and Estonia also experienced decreasing *H. pylori* prevalence in both adults and children. Literature studying trends of *H. pylori* prevalence in Turkey is scarce; only one study was found exploring the change of *H. pylori* prevalence in Turkey.

The study was conducted in 1990 and 2000 among children aged 7-14⁹. The prevalence decreased from 78.5 % to 66.3 % but using serum based serology as the method of *H. pylori* detection rendered the results somewhat unreliable because of differing sensitivities and persistence of antibodies in serum long after the dissolution of infection¹⁰.

The aim of our study was to evaluate the prevalence change of *H. Pylori* infection, gastritis and gastric atrophy in children undergoing esophagogastroduodenoscopy (EGD) in Ankara within a 10- year period.

Material and Methods

This is a retrospective study which reviews the records of all EGD performed at the Pediatric Gastroenterology Division, Ankara University, Ankara, Turkey during two periods (January 2002-December 2003 and January 2012-December 2013), ten years apart. Children who underwent EGD during the period of January 2002-December 2003 were defined as Group I, whereas children who underwent EGD

during the period of January 2012-December 2013 were defined as Group II.

A total of 590 children, 294 children in Group I and 296 children in Group II underwent EGDs during study periods. Gastric biopsies were available in 131 (44.6%) and 249 (84.1%) EGDs in Group I in Group II, respectively. Finally a total of 380 patients, 66.6% girls were enrolled in the study. The mean age was 12.3 ± 4.7 years.

Endoscopies were performed by two pediatric gastroenterologists and fellows under sedation. At least two biopsy specimens were obtained each from gastric antrum and corpus (body). Gastric biopsies were submitted for histology, stained with hematoxylin and eosin along with Giemsa for *H. pylori* and assessed by an expert pathologist for the presence of gastritis according to the updated Sydney classification¹¹. All children who had antrum biopsy were included in the study. Data collected retrospectively included age, gender and histologic findings using the patients EGD and pathology reports. Each pathology report contains histological description, Sydney classification and pathological diagnosis of tissue specimen. Patients were defined as *H. pylori* infected when histology was positive for *H. pylori*.

Ethical approval was obtained from ethical board of Ankara University.

Statistical Analysis

A chi-square test was used for categorical variables. Student t test was used for normal continuous variables. All p values were two tailed and >0.05 considered nonsignificant. SPSS 16® was used for statistical analysis.

Results

Although no differences were observed

considering age and gender between the groups, *H. pylori* positivity, gastritis and gastric mucosal atrophy were significantly different. The prevalence of *H. pylori* was significantly higher in Group I (48.1%) than Group II (23.1%) ($p < 0.001$). Also in Group I, gastritis and gastric mucosal atrophy was significantly higher than Group II ($p < 0.001$). The demographic and histopathological data of the analyzed group I and II are shown in Table I.

In both Group I and II, *H. pylori* positive patients were older (13.4 ± 3.6 years) than *H. pylori* negative counterparts (11.8 ± 5 years) ($p < 0.001$). The prevalence of antral gastritis and gastric mucosal atrophy were significantly related with *H. pylori* positivity ($p < 0.001$) (Table II) Exploring *H. pylori* positivity in age groups of five, we found that in Group I, rate of *H. pylori* positivity is statistically significant in each age group ($p < 0.05$), while in Group II the difference is insignificant ($p > 0.05$) (Figure 1).

Discussion

Our single-center retrospective study showed that the current prevalence of *H. pylori* in 2013 is significantly lower compared to the prevalence of *H. pylori* in 2003. Decrease in the prevalence of *H. pylori* infection was reported in European countries like Finland, Denmark, Germany among others previously^{12,13}. A study from Finland showed a decrease in serum *H. pylori* IgG positivity from 56 to 31 percent in adults⁵. Likewise the prevalence dropped from 21 to 10 percent in a Dutch study concerning children. Both studies were conducted between the 70's and the 90's. In the developing world, the trend was similar yet *H. pylori* prevalence was higher. In a large cohort of Brazilian children *H. pylori* was investigated by rapid urease test and positivity decreased from 60.4 to 30.4 percent in a decade from 1993 to

Table I. Patient Characteristics with Respect to Timing of Endoscopy.

	Group I (n=131)	Group II (n=249)	p
Age, years	12.1 ± 4	12.4 ± 5	0.521
Sex (Female), n (%)	89 (67.9)	164 (65.9)	0.386
<i>H. pylori</i> positivity, n (%)	63 (48.1)	59 (23.7)	<0.001
Antral gastritis, n (%)	99 (75.6)	88 (35.3)	<0.001
Atrophy, n (%)	54 (41.2)	7 (2.8)	<0.001

Table II. Patient Characteristics with Respect to *H. Pylori* Presence.

	Children with <i>H. pylori</i> (+) (n=122)	Children with <i>H. pylori</i> (-) (n=258)	p
Age, years	13.4 ± 3.6	11.8 ± 5	< 0.01
Sex (Female), n (%)	86 (70.5)	167 (66)	0.295
Antral gastritis, n (%)	114 (93.4)	73 (28.3)	< 0.001
Atrophy, n (%)	42 (34.4)	19 (7.4)	< 0.001

2002¹⁴. Two findings are striking in these studies; decreasing prevalence through time and lower prevalences in developed countries. The reasons of decline of *H. pylori* infection have not been fully clarified yet. In Finland, decrease of *H. pylori* infection is believed to be due to the "screen and treat" project¹⁵. In Czech Republic, decline in *H. pylori* prevalence is explained by the profound socio-economic changes after the fall of communist regimes¹⁶. Poor living standards, low socioeconomic status, overcrowded families and low education of parents are still major risk factors of *H. pylori* infection. Considering risk factors, it is not surprising to see lower rates of infection where socioeconomic standards are higher. However, several studies from developing countries like Uganda, Brazil and Middle East region showed that the prevalence of *H. pylori* declined in children despite persisting poor hygiene, low standard of living and bitter socioeconomic conditions¹⁴.

Epidemiologic studies concerning change of *H.pylori* prevalence in Turkey is few. In the serology based study conducted with school children in Ankara, *H. pylori* prevalence was shown to decrease from 78.5% in 1990 to 66.3% in 2000⁹. Other cross sectional studies reported differing results. Latest pediatric studies revealed percentages between 23.6% and 50%. Looking at the studies dating back to early 2000's, *H. pylori* prevalence in children was uniformly above 40 %^{4, 17-21}.

Explaining the decrement in *H.pylori* prevalence in our center is not easy. Relatively favourable and improving socioeconomic conditions may be the main reason. Gross domestic product per capita of Turkey almost tripled during the same period which may explain this trend²².

Prevalence studies of *H. pylori* is usually conducted by serology or urea breath test. These methods are noninvasive, easier to conduct and have a lower cost compared to EGD and histopathology. Urea breath test and *H. pylori* antigen in stool has high, sensitivity, accuracy and specificity evaluated against biopsy-based tests but *H. pylori* IgG in serum is not reliable for use in children¹⁰. Our data is based on histopathology which is the gold standart for *H.pylori* diagnosis. Moreover, our findings confirmed the association of gastric mucosal atrophy and *H. pylori* infection as in previous studies²³⁻²⁵. We also observed an increased infection rate in older age groups. This was consistent with the literature where the rate of infection increases with age²⁶. *H. pylori* positivity above 15 years was significantly lower in Group 2 compared to Group 1. This may be due to the tendency of *H.pylori* acquisition age increase in recent years.

Some weak points of the study need to be addressed. Nearly half of the pathology reports of antral biopsies in group 1 could not be reached due to archiving problems but as the reports were lost randomly, we think it is still not a biased sample. Site of biopsy was not standardized. Pathology specimens were evaluated by the same institution but by different professionals. Proton pump inhibitor and antibiotic usage before EGD could not be ruled out.

In conclusion, the prevalence of *H.pylori* infection in the children in our center has declined over the past 10 years. This decrease can be explained mostly by the relatively improving socio-economic status. However, it is necessary-also to consider the environmental and human host factors.

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