Helicobacter pylori infection in North-East Poland between 1996 and 2011 on the base of histological examination

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A- Conception and study design; **B -** Collection of data; **C -** Data analysis; **D -** Writing the paper;
E- Review article; **F** - Approval of the final version of the article; **G** - Other (please specify)

ABSTRACT

Purpose: The aim of the study was to conduct a 15-year (1996-2011) observations on the frequency of *Helicobacter pylori* stomach infection in patients having performed gastroscopy in the Endoscopy Unit District Hospital of Białystok, Poland

Materials and methods: Out of the 27421 patients who underwent a gastroscopy in 1996-1997, 2000-2001, 2005-2006, and 2010-2011 years were selected 4216 subjects who had performed histological examination of gastric mucosal specimens for *H. pylori* infection. The mucosal specimens after placed in buffered formalin, were subjected to standard histological procedure, and stained with hematoxylin-eosin and Giemsa**.**

Results: Stomach infection with *H. pylori* was 73.36% (1996-1997), 48.60% (2000-2001), 33.61% (2005-2006) and 32.30% (2010-2011); only between the last two 2-year intervals the difference was not significant.

Conclusions: The results of current study indicate on steadily declining stomach infection with *H. pylori*.

Keywords: *Helicobacter pylori*, histology, gastric mucosa

DOI: 10.5604/01.3001.0012.1113

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Received: 03. 03.2018
Accepted: 06.04.2018
Progress in Health Sciences
Vol. 8(1) 2018 pp 22-26

INTRODUCTION

Helicobacter pylori by colonizing the gastric mucosa contributes to the mucosal inflammation, gastric and duodenal ulcers and gastric cancer [7-14]. *H. pylori* infection is most common in the third world and developing countries, much less frequently occurs in highly developed countries [16]. There was a tendency to decline *H. pylori* stomach infection with the progress of economic growth [1-5]. At least in part this is related to *H. pylori* eradication procedures, but also to the evident improvement of living standards [15]. There are a few studies indicating a rate of *H. pylori* stomach infection in Poland in the past [6,17,18]; the referenced publications used various tests documenting *H. pylori* status.

The aim of the study was to conduct a 15-year (1996-2011) observations on the occurrence of *H. pylori* stomach infection based on the histological assessment of endoscopic specimens of the gastric mucosa.

MATERIALS AND METHODS

Characteristics of patients

Out of the 27421patients who underwent a gastroscopy in 1996-1997, 2000-2001, 2005-2006, and 2010-2011 years in the Endoscopy Unit District Hospital of Białystok, were selected 4216 subjects who had performed histological examination of gastric mucosal specimens for *H. pylori* infection.

The assessment of* H. pylori *stomach infection

The endoscopic examinations were conducted with fiberoscopes of the Olympus company (GIF Q 20, GIF Q 30, GIF V2, GIF Q 145, GIF Q 165). During gastroscopy, two specimens were taken from the prepyloric and two from the body regions using the standard sterile biopsy forceps. The specimens were placed in buffered formalin, subjected to standard histological procedure, and stained with hematoxylin-eosin and Giemsa [19,20].

Statistical analysis

For statistical analysis χ^2 test was used (STATISTICA 7.1)

RESULTS

Of the 27421 patients who underwent gastroscopic examination in the analyzed period (1996-1997, 2000-2001, 2005-2006, 2010-2011), the microscopic assessment of gastric mucosal specimens for *H. pylori* was performed in 4216 (15.38%) subjects; 6.56%, 12.86%, 14.89% and 32.59% in the consecutive periods analyzed, respectively (Table 1).

Stomach infection with *H. pylori* was 73.36% (1996-1997), 48.60% (2000-2001), 33.61% (2005-2006,) and 32.30% (2010-2011); only between the last two intervals the difference was not significant (Table 2).

More than one gastroscopy in the same patient combined with the simultaneous histological evaluation of *H. pylori* infection was performed in 10.04%, 7.13%, 4.11%, and 2.81% of subjects in 1996-1997, 2000-2001, 2005-2006, and 2010-2011 years, respectively (Table 2).

Table 1. Characteristics of performed histological examinations of gastric mucosa specimens

Years	Number of performed histological examinations	Number of performed histological evaluations of *H. pylori* (%)
1996-1997	7900	518(6.56)
2000-2001	7637	982(12.86)
2005-2006	6536	973(14.89)
2010-2011	5348	1743(32.59)
Total	27421	4216(15.38)

Table 2. Characteristics of population having performed histological evaluation of *H. pylori*

Years	Men/Women	Age(years)	*H. pylori* infected population	*H. pylori* evaluation more than one time in analyzed 2-year period
1996-1997	313/205	49.86±14.70	380/518 (73.36%)	52/518 (10.04%)
2000-2001	563/419	59.72±15.14	447/982 (48.60%)[a]	70/982 (7.13%)
2005-2006	423/550	58.55±16.26	327/973 (33.61%)[a,b]	40/973 (4.11%)
2010-2011	768/975	60.63±16.08	563/1743 (32.30%)[a,b]	49/1743 (2.81%)

[a] P<0.001 vs 1996-1997; [b] P<0.001 vs 2000-2001

Only in 1996-1997 years, the largest number of microscopic evaluation of stomach infection with *H. pylori* was performed in the group 40-49 years old. In the next analyzed 2-year intervals, with the age of the patients increased the number of microscopic assessment of *H. pylori* (Table 3).

Table 3. Number of subjects with groups of different age having performed histological evaluation of *H. pylori*

Age/years	1996-1997	2000-2001	2005-2006	2010-2011
<30	38 (7.36%)	31 (3.15%)	64 (6.58%)	118 (6.77%)
30-39	87 (16.86%)	57 (5.80%)	60 (6.17%)	91 (5.22%)
40-49	145 (28.10%)	186 (18.94%)	149 (15.31%)	181 (10.38%)
50-59	98 (18.99%)	172 (17.51%)	189 (19.42%)	364 (20.88%)
60-69	111 (21.51%)	233 (23.73%)	234 (24.05%)	393 (22.55%)
>70	37 (7.17%)	303 (30.86%)	277 (28.47%)	596 (34.19%)

Stomach infection with *H. pylori* decreased in all age groups in consecutive two-year periods; the decrease was slowest in the group 40-49 years old, 73.10%, 59.14%, 44.97%, 37.60%, respectively, and fastest in the group of patients over 70 years, 73.00%, 40.92%, 26.71%, 27.40%, respectively (Table 4).

Table 4. *H. pylori* infection rate (%) in relation to distinguished age groups

Age/years	1996-1997	2000-2001	2005-2006	2010-2011
<30	76.30	51.61	37.50	37.30
30-39	65.50	49.12	35.00	36.30
40-49	73.10	59.14	44.97	37.60
50-59	76.50	56.98	38.62	34.10
60-69	77.50	43.35	29.06	33.30
>70	73.00	40.92	26.71	27.40
Total	73.36	48.60	33.61	32.30

DISCUSSION

In the years 1996-2011, the stomach infection with *H. pylori* evaluated microscopically decreased in the Endoscopy Unit of District Hospital in Bialystok, Poland, from 73.36% to 32.30%. There are two main reasons for this phenomenon, i.e. progressive rapid socio-economic development of the region and a large-scale eradication of the bacterium *H. pylori* as a consequence of European and Polish gastroenterologists recommendations [7-14]. The results corresponding with our own results were obtained in many other countries experiencing rapid socio-economic growth [1-5].

The total number of histological examinations of the gastric mucosal specimens decreased in the Endoscopy Unit between 1996 and 2011 years, but this was related to the declining number of performed gastroscopies. Despite the decreasing number of gastroscopies, the rate of microscopic evaluation of *H. pylori* infection increased. This trend should be evaluated positively, although still only 1/3 of the histological examinations of mucosal specimens were enriched with the assessment of *H. pylori* infection. In the years 1996-2011, histopathology unit did not routinely performed microscopic assessment of endoscopic specimens of the gastric mucosa for the presence of *H. pylori*. In the diagnosis of *H. pylori* infection of the gastric mucosa specimens, rapid urease test has played and still plays a pivotal role in the Endoscopy Unit.

In the years 1996-1997, the number of patients in distinguished age groups varied, but infection rates showed no significant differences in these groups. It must be assumed that the main group of subjects endoscoped in this period consisted of those with peptic ulcer disease qualified for *H. pylori* eradication therapy [7,11,22]. The largest group of patients aged 40-49 years, and the highest number of control gastroscopic examinations performed in 1996-1997 years, probably in order to evaluate the effectiveness of eradication therapy, seems to confirm this hypothesis.

In 2000-2001 and subsequent years, the number of endoscoped patients over 60 years old increased. This phenomenon seems to be completely natural, because of the higher incidence of stomach cancer at the age over 55 and other pathologies of the upper gastrointestinal tract being a consequence of regular use of aspirin and non-steroidal anti-inflammatory drugs. In this age group, we observed

the lowest rate of *H. pylori* infection of the stomach. The largest number of subjects in this age group and the lowest rate of its *H. pylori* infection compared to other age groups may explain in part declining rate of stomach infection observed in all study population.

Gastroscopy examinations were performed in patients using a variety of drugs including proton pump inhibitors. However, by taking mucosal specimens both from the prepyloric and corpus areas, the probability of error resulting from the variable location of bacteria in the stomach following treatment with proton pump inhibitors is rather small [21].

CONCLUSIONS

The results of previous studies on the stomach infection with *H. pylori* which used various diagnostic methods suggest a steadily declining infection rates in Poland [6,17,18]. The current study clearly confirms this observation. However, the studies limited to a small group of patients analyzed in one endoscopy unit does not allow to conclude that the observed changes in the frequency of infection among patients living in a relatively small area of the country reflect the changes that have occurred in the whole population. Nevertheless, considering the results of other similar studies carried out abroad, one can not rule out that declining infection with *H. pylori* took place also in Poland.

Conflicts of interest

None declared.

Funding

The study was supported by the Medical University of Białystok, grant no. 3 – 18628L. The study was approved by the Ethical Committee of the Medical University of Białystok and each subject gave informed written consent before participation in the study.

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