Helicobacter Pylori Infection In Gastrectomy Specimens

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Abstract

The gastrectomy specimens of 46 patients were re-examined microscopically.
Twenty-eight of the 31 patients with malignant gastric tumors had gastric carcinoma. Seven (25%) of these had H. pylori infection.
Nine patients had gastric ulcer and six had duodenal ulcer. The prevalence of H. pylori infection in this group (of benign diseases) was 47% (7/15).
The prevalence of H. pylori infection is lower than expected in H. pylori-related gastric diseases. The difference between the prevalences of H. pylori infection in benign and malignant gastric diseases was not statistically significant.
Our conclusions are that diffuse type gastric garcinoma is more correlated with H. pylori infection than the intestinal-type and that the diffuse-type gastric carcinoma tends to occur closer to pylorus than does the intestinal-type. This differs from those of the reviewed literature. We therefore suggest that H. pylori-related diseases in Turkey may have extraordinary features and that more extensive studies be carried out.

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BACKGROUND

After having been isolated by Marshall and Warren in 1982 and shown to be associated with duodenal ulceration, Helicobacter pylori has been claimed to be responsible in the pathogenesis of chronic gastritis, gastric carcinoma and gastric non-Hodgkin lymphoma ($_1$). H. pylori is more prevalent among people living in lower socioeconomic conditions and thus in the developing world ($_2$). About half of the population in industrialized countries and more than 90% of people in developing countries are infected with H. pylori ($_3$).

We investigated the characteristics of benign and malignant diseases of the stomach, that are known to be associated with H. pylori infection.

MATERIALS AND METHODS

We retrospectively examined the surgical specimens of 31 patients with malignant gastric tumors (7 female + 24 male) and 15 patients with peptic ulcer disease (4 female + 11 male), who had been hospitalized in the Second Department of General Surgery, Ministry of Health Ankara Training and Research Hospital, Ankara, Turkey between January 1st, 1993 and August 1st, 1998 and had been treated with gastrectomy (15 total and 31 partial).

These specimens were fixed in 10% formaline solution for 48 hours and embedded in paraffin blocks. This material was cut into 6 (m-thick sections, incubated in 50 (C for 12 hours, deparaffinized with xylol, dehydrated with ethyl alcohol and hydrated with deionized water and stained with hematoxylin-eosin.

All specimens were re-examined for the presence of H. pylori. Histoclinical assessment and H. pylori density determinations were made according to Lauren ($_4$) and Sydney ($_5$) classifications respectively (TABLE 1).

Figure 1

TABLE 1: Grades of H. pylori Density in Gastric Carcinoma Specimens According to Sydney Classification

DENSITY	EXPLANATION
0	*H. pylori* absent
1	Individual organisms or small groups covering less than one third of the mucosal surface
2	Between 1 and 3
3	The presence of large groups of organisms on the surface and upper pits of more than two thirds of mucosal surface examined

RESULTS

MALIGNANT TUMORS OF THE STOMACH

Of the 31 patients who had a malignant tumor of the stomach, 28 had gastric carcinoma, two had gastric sarcoma and one had gastric lymphoma.

Of the sarcomas, one was in the corpus and the other sarcoma demonstrated extensive involvement. The lymphoma was located in the corpus. The locations of gastric carcinomas are shown in (TABLE II).

Figure 2

TABLE 2: Location of the Gastric Carcinomas

LOCATION	NUMBER OF PATIENTS (%)
Cardia	1 (4)
Fundus	2 (7)
Corpus	8 (29)
Antrum	15 (54)
Wide-spread	2 (7)
TOTAL	**28 (100)**

Of the gastric carcinomas, 14 (50%) were intestinal and 14 (50%) were diffuse. Clinical staging of the patients' tumors were performed according to TNM classification ($_6$) as shown in (TABLE 3).

Figure 3

TABLE 3: Clinical Stages of the Gastric Carcinoma Cases

STAGE	NUMBER OF PATIENTS (%)
IA	1
IB	1
II	9
IIIA	14
IIIB	3
TOTAL	**28**

H. pylori was absent in the two patients with gastric sarcoma. The patient treated with gastric lymphoma was infected with H. pylori. We detected H. pylori infection in seven (25%) patients with gastric carcinoma whereas H. pylori was not found in the remaining 21 (75%) patients with this disease. According to Sydney classification, the density was "1" in the lymphoma and six gastric carcinomas, "2" in one gastric carcinoma and "0" in the 21 gastric carcinoma specimens.

BENIGN DISEASES OF THE STOMACH

The patients with benign diseases of the stomach are shown in TABLE IV. Two of these patients had gastric polyps.

Figure 4

TABLE IV: The Patients with Benign Diseases of the Stomach

DISEASE	NUMBER OF PATIENTS (%)
Gastric ulcer	9 (60)
Duodenal ulcer	6 (40)
total	**15 (100)**

Seven patients (47%) with a benign disease of the stomach had H. pylori infection. H. pylori was absent in the remaining eight patients (53%).

According to Sydney classification, the grade of H. pylori density was "1" in six (40%) patients and "2" in one patient with a benign disease. Eight patients in whom H. pylori was absent in this group were graded as "0".

STATISTICAL ANALYSIS

Statistical analysis of this study was performed using SPSS for Windows 7.5 software. The following correlations were found although their Spearman coefficient are weak:

The closer the gastric carcinoma is located to the pylorus, the more likely it presents as diffuse histological type. As the clinical stage increases, the chances that the gastric carcinoma is diffuse also increases.

The prevalence of H. pylori infection increases as the location of the gastric carcinoma approaches the pylorus. H. pylori infection is more prevalent in diffuse-type gastric carcinoma than the intestinal-type. H. pylori infection becomes more prevalent as the stage increases.

H. pylori density diminishes as the location of the gastric carcinoma shifts to pylorus. H. pylori density is lower in intestinal-type gastric carcinoma than the diffuse-type. As the clinical stage increases, H. pylori density increases.

According to Fischer's exact chi-square test, there is no difference in the prevalence of H. pylori infection and peptic ulcer disease (p=0.18369).

DISCUSSION

Investigators have reported different prevalence rates of H. pylori infections in gastric carcinoma specimens. Whereas the prevalence in Japan, where gastric carcinoma is the most common cancer, is 90% ($_{7}$), a group of investigators in Holland has found a lower prevalence (58.5%) (5). The prevalence in our study is 25%. Turkey is a developing country and the following two factors may account for our prevalence, that is even lower than that reported in a developed counry like the United States (approximately 30%) ($_{8}$):

Although in many studies it is concluded that intestinal-type gastric carcinoma had a stronger association with H. pylori infection than the diffuse-type, there are studies which supports our conclusion that diffuse-type carcinoma has a stronger relationship with H. pylori infection ($_{9}$).

Acoording to the results of our study, H. pylori is more closely associated with more distally-located gastric carcinomas than the proximally-located ones and this is supported by other studies ($_{10}$).

In contrast to the reviewed literature, diffuse-type gastric carcinoma tends to arise closer to the pylorus instead of fundus.

The association between H. pylori and gastric lymphoma has been proven by the complete regression of the tumor when the patients are treated with antimicrobials effective against H. pylori ($_{11}$). It is notable that our only patient with gastric lymphoma was infected with H. pylori.

CONCLUSION

This study reveals that in Turkey some characteristics of the associations of gastric diseases with H. pylori may be different from those reported in the oncology literature. More studies with larger patient groups are needed to check the validity of these results.

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References

1. Marshall, B.J., Warren, J.R.: Unidentified curved bacilli in the stomach of patients with gastritis and peptic ulceration, Lancet 1984; i: 1311
2. Dunn, B.E., Cohen, H., Blaser, M.J.: Helicobacter pylori, Clin. Microbiol. Rev. 1997; 10:720
3. Monath, T.P., Lee, C.K., Ermak, T.H., Gwendolyn, A.M, Weltzin, R.A., Giannasca, P.J., et al.: The search for vaccines against H. pylori, Infect. Med. 1998; 15:539
4. Lauren, P.: The two histological main types of gastric carcinoma: diffuse and so-called intestinal type carcinoma, Acta. Pathol. Microbiol. Scand. , 1965; 64: 31
5. Craanen, M.E., Blok, P., Dekker, W.: Helicobacter pylori and early gastric cancer, Gut 1994; 35:372
6. Kocaoglu, H., Karaayvaz, M., Demirci, S.: Mide kanserleri. In Klinik Cerrahi Onkoloji, Ünal, A., editor, Ankara, Türkiye Klinikleri Yayinevi, 1997, p 472.
7. Shibata T, Imoto I, Ohuchi Y, Taguchi Y, Tagaji S, Ikemura N et al.: Helicobacter pylori infection in patients with gastric carcinoma in biopsy and surgical resection specimens. Cancer 1996; 77:1044
8. Hui-Min Z, Wakisaka N, Maeda O, Yamamoto T: Vitamin C inhibits the growth of a bacterial risk factor for gastric carcinoma: Helicobacter pylori. Cancer 1997; 80:1897
9. McFarlane GA, Munro A: Helicobacter pylori and gastric cancer. Br J Surg 1997; 84:1190
10. Kikuchi S, Wada O, Nakajima O, Nishi T, Kobayashi O, Konishi T, et al.: Serum anti-Helicobacter pylori antibody and gastric carcinoma among young adults. Cancer 1995; 75:2789
11. http://www.harrisonsonline.com/server-java/Arkhold/harrisons/.../updt1220.htm

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