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Comparative studies on epithelial lesions at gastric cardia and pyloric antrum in subjects from a high incidence area for esophageal cancer in Henan, China *

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Abstract

AIM To investigate the pathogenesis of gastric cardia and the distal part of stomach cancer and to further characterize the histopathogenesis model for gastric cardia cancer from the high-risk population for esophageal cancer.

METHODS Mass survey with endoscopic mucosa biopsy and histopathological examination were carried out on 226 subjects aged above 30 years. Three biopsies were collected one each from the middle part of the esophagus, the gastric cardia and the pyloric antrum. The biopsy tissue was fixed with 85% alcohol and paraffin-embedded.

RESULTS The incidence of intestinal metaplasia and dysplasia at gastric cardia epithelium was higher than that at the pyloric antrum from the subjects in the same area. And there were high incidences of both esophageal and gastric cardia cancer, but a low incidence of gastric cancer at the distal part of the stomach.

CONCLUSION There might be different etiology and pathogenesis of gastric cardia and pyloric cancer at the distal part of the stomach.

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INTRODUCTION

Gastric cardia cancer is one of the most common malignancies in the population at high-incidence areas for esophageal cancer in Henan, China. In spite of the mechanism for this coincidence of high incidence of esophageal and gastric cardia cancer in this special population, the evidence indicated that the pathogenesis and the risk factors of gastric cardia carcinogenesis are quite different from those of distal part of gastric adenocarcinoma. Another characteristic for gastric cardia cancer in this special population is the discordant higher incidence of gastric cardia cancer and much lower incidence of distal part stomach cancer. It appears very important to compare the pathogenesis in gastric cardia and distal part of the stomach cancers, which will facilitate the understanding of the factors and mechanisms of carcinogenesis of esophagus and gastric cardia in this area. The specific aim of this study is to further characterize the pathogenesis model of gastric cardia cancer by comparing the lesions at gastric cardia and pyloric antrum in the symptom-free subjects from the high incidence area for both esophageal and gastric cardia cancer.

MATERIALS AND METHODS

Subjects

All the subjects were from Loucun Village, Henan Province, a high incidence area for esophageal cancer, subjects (n = 226) aged above 30 years without gastrointestinal symptoms were selected randomly. The biopsied tissues were fixed in 85% alcohol, embedded in paraffin and cut in 5 μm for HE staining.

Endoscopic biopsy examination

Three biopsies were obtained one each from the middle part of the esophagus, the gastric cardia and the pyloric antrum.

Histopathological analysis

Histopathological diagnosis for gastric cardia and pyloric antrum epithelia were made according to the previously established criteria. Based on the cell

morphology and tissue structure, the epithelia were divided into normal, the epithelial cells differentiated well, without obvious inflammatory cell infiltration; chronic superficial gastritis, an inflammation manifested by mild lymphocyte and plasma cell infiltration; chronic atrophic gastritis, mucosal glandular morphology eradicated partially or completely by connective tissues with interglandular space infiltrated mainly by plasma cells and lymphocytes; dysplasia, characterized by nuclear atypia with or without architectural abnormalities in the gastric epithelium, but without invasion; and intestinal metaplasia, columnar absorptive cells and mucous goblet cells of intestinal phenotype partially replace portions of the gastric mucosa.

Table 1 Histological results of gastric cardia and pyloric mucosa biopsy

Sites	Cases	Normal(%)	Chronic superficial gastritits (%)	Chronic atrophic gastritis (%)	Intestinal metaplasia (%)	Dysplasia (%)
Gastric cardia	226	117(51)	54(23)	36(16)	12(7)	8(3)
Gastric pyloria	226	128(57)	43(19)	46(20)	7(3)	2(1)

RESULTS AND DISCUSSION

The histopathological results of gastric cardia and pyloric mucosa biopsy of 226 subjects from the high incidence area for esophageal cancer are listed in Table 1. The results show that the incidence of intestinal metaplasia and dysplasia in gastric cardia was significantly higher than that in pyloria in the subjects from the same area, although the incidence of chronic superficial gastritis and chronic atrophic gastritis in gastric cardia was similar to that in gastric pyloria. This observation suggested that different factors and mechanism might be involved in the carcinogenesis of gastric cardia carcinoma and pyloric carcinoma in the area, which was consistent with the previous results that there was a high incidence of gastric cardia cancer, but low incidence of distal part of stomach cancer in the high incidence area for esophageal cancer.

Gastric adenocarcinoma is one of the most common malignant diseases in China and was previously considered as the cancer occurring at the distal parts of the stomach and the adenocarcionma occurring at gastric cardia was usually included, and classified into the type of esophageal cancer. However, the pattern of gastric cancer has changed over the past decades. In contrast to the decrease in cancer incidence from the distal part of the stomach, the adenocarcinoma incidence from the gastric cardia and the esophageal and gastric cardia junction increased dramatically, especially in western countries[1-4]. This phenomenon was particularly obvious in the high-incidence area for esophageal cancer in northern China. Retrospective analysis for esophageal and gastric cardia cancer occurrence in Linzhou City (originally known as Linxian) from 1987-1995 indicated that gastric cardia cancer accounted for 45% of all the cancers from digestive tract, and esophageal cancer 55%[5].

It is worth emphasizing that both the incidences of esophageal and gastric cardia carcinomas were higher among the subjects from the high-incidence area for esophageal cancer, while the incidence of distal gastric carcinoma was very low. It suggested that different factors and mechanism of carcinogenesis were involved in these two kinds of tumors. Recent reports showed that the infection of *Helicobacter pylori* was different between the gastric cardia and pylori. Therefore, further studies of the molecular basis for cardia and pyloria epithelial pathogenesis will be of great importance in the understanding of molecular mechanism and the etiological factors of carcinogenesis in the gastric cardia cancer.

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