



ORIGINAL ARTICLE

Barrett's esophagus and risk of esophageal adenocarcinoma: A retrospective analysis



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KEYWORDS

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Summary *Background and aim:* Barrett's esophagus (BE) is the most common cause or precursor of esophageal adenocarcinoma (EAC), a condition with a poor prognosis. This study aimed to investigate the clinical characteristics and risk of EAC in patients with BE.

Materials and methods: From January 2001 to December 2012, a total of 425 patients with histologically proven BE were identified and analyzed retrospectively. Patients' personal data (smoking, alcohol consumption), underlying systemic disease data (diabetes mellitus and hypertension), endoscopic findings (hiatal hernia, peptic ulcer, endoscopically suspected esophageal metaplasia, severity of reflux esophagitis, rapid urease test), and pathological findings (degree of dysplasia, *Helicobacter pylori* infection) were collected for further analysis.

Results: In this retrospective study, 15 patients were diagnosed with EAC. Only one patient was found to have EAC during endoscopic surveillance for BE. The majority of patients (14/15 patients) suffered alarm symptoms and were diagnosed to have BE and EAC concurrently. Meanwhile, EAC is already relatively at an advanced stage. The mean age for diagnosis of EAC in a patient with BE was 67.67 ± 9.92 years old. All patients were male. From a total of 15 patients, 33.3% (5 patients) demonstrated erosive esophagitis under endoscopy and 60% (3 of 5 patients) of these were classified as Los Angeles grade C or D disease.

Conclusion: Our study found that BE-associated EAC mostly occurred in older men. In the group with BE-associated EAC, the majority of patients were discovered due to alarm

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symptoms, at the same time as esophageal adenocarcinoma had already developed. Further prospective study is needed to stratify the risk of disease progression in BE patients.

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Introduction

Barrett's esophagus (BE) is the most common cause or precursor of esophageal adenocarcinoma (EAC) and has a poor prognosis. The overall risk of cancer developing in BE patients is estimated to be approximately 0.12–0.5% per year [1–4]. The prognosis is linked strongly to the stage of the tumor at the time of detection. The 5-year survival rate can be as high as 83–90% in the early stages, compared with only 10–15% in late-stage cancers [5–7]. Chronic esophageal acid exposure, being male, old age, visceral obesity, hiatus hernia, smoking, and alcohol consumption are risk factors for BE in Asia. *Helicobacter pylori* infection showed a protective effect on BE [8]. In Western countries, BE has been diagnosed in approximately 10–15% of patients undergoing an endoscopy for gastroesophageal reflux disease (GERD) symptoms [1]. Although GERD is less prevalent in Asia than in the West, its incidence is rapidly rising in Asia due to the change to Western-style eating habits [9]. EAC has increased progressively with an increased prevalence of GERD in Western countries; whereas in Asia, despite the increased prevalence of GERD, EAC has not increased accordingly [8,10]. However, esophageal squamous cell carcinoma is still the dominant cell type of esophageal cancer in Asian countries. Our retrospective study aimed to investigate the clinical characteristics and risk of EAC in patients with BE in Taiwan.

Materials and methods

Patient selection

A total of 425 patients, first diagnosed with BE histopathologically between 2001 and 2012, were identified retrospectively by reviewing pathological reports at Chang Gung Memorial Hospital, Linkou, Taiwan. These patients were analyzed using personal characteristics, including age, sex, smoking and alcohol usage, underlying systemic disease (diabetes mellitus and hypertension), and indications from endoscopic examination; endoscopic findings (hiatal hernia, peptic ulcers, severity of reflux esophagitis, rapid urease test, and endoscopically suspected esophageal metaplasia); and, pathological findings (degree of dysplasia, *H. pylori* infection). Rapid urease test was used to determine the presence of *H. pylori* and it depended on clinical indication. However, not all BE patients received the rapid urease test in this retrospective study. The patients were then analyzed using the above information to identify the risks for EAC in the Barrett's population. This study was carried out with preapproval by the Linkou Chang-Gung Memorial Hospital Institutional Review Board (102-2699B).

Endoscopy and definition of BE

Indications of the endoscopies were collected from the descriptions on the endoscopic official reports and comprised the typical reflux symptoms (including acid regurgitation and heart burn), abdominal pain, asymptomatic or surveillance of BE, gastrointestinal (GI) tract bleeding, chest pain, dysphagia, and other causes. Reflux esophagitis was diagnosed using endoscopy and classified into grades A–D using the Los Angeles (LA) classification [11,12]. Endoscopically suspected esophageal metaplasia (ESEM) was defined as a length of columnar epithelium that extended continuously from the gastric lumen to the esophagus and was recorded using Prague Barrett's C (circumferential) & M (maximal extent) criteria [13]. The length of BE was not measured using Prague Barrett's C & M criteria prior to 2006. The definition of BE using pathological criteria requires that intestinal metaplasia with goblet cells is present in the esophageal columnar-lined mucosa of the esophagus.

Statistical analysis

We performed statistical analyses on the acquired data using SPSS version 20.0 (Armonk, NY: IBM Corp). Nine variables, including sex, age, indication of esophagogastroduodenoscopy (EGD), smoking history, alcohol use, hiatal hernia, the presence of erosive esophagitis, and underlying diseases (diabetes and hypertension) were considered as potential risk factors for adenocarcinoma among the BE patients. Quantitative data were reported as means and standard deviation, whereas categorical data were expressed as proportions.

The data were analyzed using the Student *t* test for continuous variables, and Chi-square test for categorical variables.

Univariate analysis was performed to assess the effect of each variable. Logistic regression was used to identify individual correlations associated with adenocarcinoma risk. Using the backward stepwise method, variables with a *p* value < 0.05 were included in the multivariate logistic regression models. Odds ratios (ORs) and 95% confidence intervals (CIs) were estimated where appropriate. A two-sided *p* value < 0.05 was considered to be significant in all statistical tests.

Results

Barrett's population

In the total study population, 313 patients (73.6%) were males with a mean age of 57.04 ± 17.38 years, and the male-to-female ratio was 2.8:1. Adenocarcinoma was diagnosed in

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