



Prevalence of Barrett's esophagus in Lebanon

ESOPHAGUS

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ABSTRACT

Background/Aims: To determine the prevalence of Barrett's Esophagus (BE) in a tertiary care center in Lebanon and to compare IT with regional and global data.

Materials and Methods: All esophagogastroduodenoscopies (EGDs) performed between January 2003 and October 2013 at the American University of Beirut Medical Center (AUBMC) were reviewed, and cases of endoscopically suspected esophageal metaplasia (ESEM) were identified. Definite BE was considered only if histologically proven intestinal metaplasia was present.

Results: Totally, 16,787 patients underwent EGD; 219 patients (1.3%) were labeled as having ESEM. Only 41 patients had biopsyproven BE (18.7% of ESEM and 0.24% of total patients). The mean age of the patients with BE was 58.1 years [Standard deviation (SD) =13.7] and 78% were men. Of the 41 patients, 14 (34.1%) had long-segment BE (LSBE) (>3 cm) while 27 had short segment Barrett's Esophagus (SSBE) (≤3 cm). Hiatal hernia was identified in 54% of the patients, more commonly in those with LSBE. Only four patients had low-grade dysplasia, and none had high-grade dysplasia.

Conclusion: The prevalence of BE in Lebanon is much lower than that in Western countries. The reasons for this East-West divide are unknown and require further investigation.

Keywords: Barrett's esophagus, reflux, metaplasia, Lebanon, prevalence, Middle East

INTRODUCTION

Barrett's esophagus (BE) is a condition in which the esophageal squamous epithelium is partially replaced by metaplastic columnar epithelium. It is an uncommon complication of long-standing gastroesophageal reflux disease (GERD); however the severity and frequency of heartburn were not useful in predicting the development or extent of metaplasia (1). Some endoscopists diagnose BE based on the appearance of salmon-colored tongues of mucosa extending proximal to the gastroesophageal (GE) junction. However, the American Gastroenterological Association (AGA) guidelines require the presence of specialized intestinal metaplasia (with goblet cells) on pathology for definitive diagnosis (2). The "Montreal Definition and Classification of Gastroesophageal Reflux Disease" describes the term endoscopically suspected esophageal metaplasia (ESEM) as "having endoscopic findings consistent with Barrett's esophagus awaiting histological evaluation," and recommends against the use of the term "Barrett's esophagus" in such patients (1).

In one study conducted in Germany, on surveillance endoscopy of patients with ESEM after 2.5 years of index endoscopy, only 11% showed evidence of BE on endoscopy and histology, whereas 42% had neither gross nor microscopic evidence of BE and 46% persistently had the appearance of "BE" at endoscopy but without demonstrating intestinal metaplasia on biopsy (3). Another recent prospective study showed that only 29% of patients with ESEM showed evidence of intestinal metaplasia on follow-up endoscopies after 2 years (4). Thus, ESEM should be labeled as "Barrett's esophagus" only when columnar epithelium is demonstrated on biopsies, with a note on the pathological presence of intestinal-type metaplasia, if detected (1).

Barrett's esophagus is considered to be a pre-neoplastic condition. Long-segment BE (LSBE) is considered to be the most important distinguished risk factor for developing esophageal adenocarcinoma (1). However, surveillance strategies are highly debatable. The true epi-

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demology of BE is difficult to discern because most cases are asymptomatic and only diagnosed incidentally or later during the course of the disease. The prevalence of BE was mostly evaluated in patients undergoing esophagogastroduodenoscopy (EGD) for a specific indication, mostly dyspepsia or GERD. The prevalence was also studied in unselected populations undergoing EGD for any indication or in completely asymptomatic patients (5). To date, there are no data regarding the epidemiology of BE in Lebanon. Similarly, data from Middle East countries are scarce. The purpose of our retrospective study was to determine the prevalence of BE in unselected patients undergoing upper endoscopy in our population and to compare it to data from region and the Western world.

MATERIALS AND METHODS

The medical records of patients undergoing EGD for any indication at the American University of Beirut Medical Center (AUBMC) between January 2003 and October 2013 were retrospectively reviewed. All EGDs were performed using either Pentax (Pentax Medical, Tokyo, Japan) or Olympus (Olympus, Tokyo, Japan) video-endoscopes. BE was endoscopically suspected by the presence of the characteristic salmon-colored tongues of mucosa extending above the Z-line. Patients with ESEM were identified, and their pathology results (if obtained) were reviewed to confirm the presence of intestinal metaplasia. Patients were subdivided into short-segment BE (SSBE) or LSBE depending on the endoscopists' estimation of columnar-mucosal extension length (less than or more than 3 cm). The following endoscopic findings were also recorded: presence of hiatal hernia (HH), erosive esophagitis, and gastritis or *H. pylori* infection. Pathologically proven BE was defined as the presence of specialized intestinal metaplasia with the presence of goblet cells. The grade of dysplasia, if present, was also documented. Patient demographics were recorded, including indications for endoscopy, smoking, and alcohol history. The institutional review board at the AUBMC approved the study for ethical research. Informed consent was obtained from all participants. SPSS version 20.0 (SPSS Inc., Chicago, Illinois, United States) was used for data entry and statistical analysis.

RESULTS

Between January 2003 and October 2013, 16,787 patients had EGDs performed at our institution. The main indications were heartburn, dyspepsia, anemia, and other less common indications. BE was endoscopically suspected in 219 patients (1.30%). Of these 219 patients (Figure 1), 170 (77.63%) had biopsies obtained and documented (Table 1). In total, 41 patients (0.24% of all patients) had pathologically-proven BE (defined as the presence of intestinal metaplasia/goblet cells). Fourteen patients underwent surveillance for BE at our institution with a mean of 2.6 endoscopies per patient performed over a period of up to 7 years. Four patients had evidence of new-onset low-grade dysplasia at the follow-up examination (with a median follow-up period of 5 years). No patients had evidence of high-

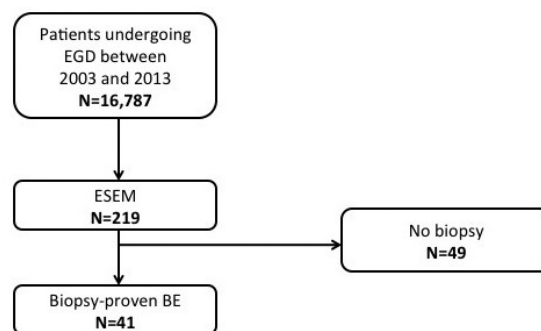


Figure 1. Flow diagram of the study patients.

Table 1. Statistics of procedures and findings per year

Year	Number of patients undergoing EGD	ESEM	No biopsies	BE on pathology
2013	1.964	30 (1.53%)	1	9
2012	2.129	26 (1.22%)	0	9
2011	1.675	25 (1.49%)	2	11
2010	1.475	21 (1.42%)	1	7
2009	1.346	25 (1.86%)	7	9
2008	1.212	22 (1.82%)	11	5
2007	1.325	18 (1.36%)	11	2
2006	1.245	14 (1.12%)	5	3
2005	1.495	15 (1.00%)	6	1
2004	1.572	12 (0.76%)	3	4
2003	1.349	11 (0.82%)	2	4
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TOTAL	16,787	219 (1.30%)	49	64 (0.38%)*

*Refers to 41 (0.24%) patients (23 out of 64 had >1 biopsy as part of surveillance) (EGD: esophagogastroduodenoscopy; ESEM: endoscopically suspected esophageal metaplasia; BE: Barrett's esophagus)

Table 2. Clinical characteristics of patients with short-segment Barrett's esophagus versus those with long-segment Barrett's esophagus

	SSBE (n=27)	LSBE (n=14)
Sex (M:F), (% males)	21:6 (78%)	11:3 (79%)
Mean age (years)	57.1	60
<i>H. pylori</i> positive	6/21 (28%)	1/9 (11%)
Presence of hiatal hernia	12/27 (44%)	10/14 (71%)
Smoker	5/23 (22%)	1/7 (14%)
Daily alcohol intake	4/22 (18%)	3/9 (33%)

(SSBE: short-segment Barrett's esophagus; LSBE: long-segment Barrett's esophagus)

grade dysplasia or malignancy on surveillance endoscopy. The majority (78%) of patients with confirmed BE were males (32 males vs. 9 females), and the mean age was 58.1±13.7 years. LS BE (>3 cm, range 3.5-15 cm) was identified in 14 patients (34.1%). *H. pylori* status was available in 30 patients, 7 of whom tested positive (23.3%). Table 2 shows the major characteristics in patients with LSBE compared to those with SSBE.

Table 3. Summary of epidemiological studies on BE prevalence from the Middle East region

Study	Origin	Type	Population studied	Number of patients	Prevalence
Gadour 1999 (10)	KSA	Retrospective	All indications	2.572	0.31%
Fireman 2001 (11)	Israel	Prospective	All indications	112	8%
Nasseri-Moghaddam 2003 (12)	Iran	Prospective	Dyspepsia	344	5%
Ahmed 2004 (13)	Sudan	Prospective	Chronic GERD	105	10.60%
Toruner 2004 (14)	Turkey	Prospective	Dyspepsia	395	7.40%
Bafandeh 2005 (15)	Iran	Prospective	Chronic GERD	1.248	2.40%
Yilmaz 2006 (16)	Turkey	Retrospective	All indications	18.766	1.5% ESEM, 0.4% BE
Rezailashkajan 2007 (17)	Iran	Prospective	All indications	501	0.20%
Bayrakci 2008 (18)	Turkey	Prospective	Chronic GERD	160	2%
Fouad 2009 (19)	Egypt	Prospective	Chronic GERD	1.000	7.30%
Odemis 2009 (20)	Turkey	Prospective	All indications	1.000	1.20%
Khamechian 2013 (21)	Iran	Prospective	Dyspepsia	1.144	5.4% ESEM, 3.7% BE
Current study	Lebanon	Retrospective	All indications	16.787	1.30% ESEM, 0.24% BE

(GERD: gastroesophageal reflux disease; ESEM: endoscopically suspected esophageal metaplasia; BE: Barrett's esophagus)

DISCUSSION

In Western countries, the reported frequency of BE is 1%-3% of unselected patient populations undergoing endoscopy (6). To date, three large population-based cohorts have studied the prevalence of BE in different general populations. In a Swedish prospective study by Ronkainen et al. (5), an upper endoscopy was performed on a random sample of 1000 adults, detecting BE in 16 individuals (1.6%), of whom only 5 were considered to have LSBE (0.5%). Similarly, population-based studies from Italy and China showed a BE prevalence of 1.3% and 1.9%, respectively (7,8). On the other hand, in a prospective study that included 961 colonoscopy patients (mean age=59 years) who underwent additional EGD, an overall BE prevalence of 6.8% was observed, with the majority (5.5%) having SSBE in those aged 40 years or more irrespective of any previous episodes of heartburn (9).

This is the first study addressing the epidemiology of BE in Lebanon. Moreover, data regarding the epidemiology of BE in the Middle East region are scarce. We performed a literature search on Pubmed for relevant articles and found few studies from Egypt, Iran, Israel, Saudi Arabia, Sudan, and Turkey with most of these epidemiological studies conducted in Turkey and Iran (Table 3) (10-21). The prevalence of BE in individuals presenting for chronic reflux evaluation was the highest ranging between 2% and 10.6%.

This retrospective study addressed the prevalence of BE in all patients presenting for endoscopy at a single tertiary care center over a period of 11 years. The prevalence of ESEM and biopsy-proven BE was found to be 1.3% and 0.24%, respectively. These numbers are comparable to regional studies of unselected population undergoing endoscopy for any given indication. For example, Yilmaz et al. (16) performed a retro-

spective study with a similar methodology and showed very similar results (ESEM in 1.5% and BE in 0.23%). Interestingly, the prevalence in BE in these studies seems to be much lower than that of western countries, suggesting that this precancerous condition is less common in the Middle East. Moreover, the rate of progression into higher grades of dysplasia was exceedingly low in the portion of patients who had surveillance EGDs. This can be attributed to many factors that warrant further investigation, such as the characteristics of the Mediterranean/Middle eastern diet, genetic factors, high prevalence of *H. pylori* in this region, and perhaps, the wide use and availability of over-the-counter PPIs.

In our study, hiatal hernias of varying sizes were documented in approximately half of the patients and were more common in those with LSBE. This suggests a possible role of hiatal hernias in the pathogenesis, most likely by increasing the acid reflux. Our data also showed a male predominance of BE in our population; however, no definitive conclusion can be drawn from this finding due to the small sample size. Another interesting finding was the low concordance between endoscopic suspicion based on appearance (ESEM) and the pathological result. More than two-thirds of the patients with ESEM were not found to have BE on histological examination. This might be due to poor or inaccurate biopsy sampling techniques or due to histological demonstration of gastric metaplasia rather than the currently-used definition that mandates the demonstration of intestinal metaplasia and goblet cells. Also, there might be an overrated suspicion of BE by the endoscopists, particularly in cases with irregular Z-line or severe esophagitis. These patients should not be labeled as having BE and should not be subjected to surveillance protocols (4). Lastly, the low prevalence of BE in our region and possibly a low rate of BE progression adds to the controversy regarding surveillance strate-

gies that are globally suggested, and the need for more region-specific data to help develop local and regional guidelines and recommendations to limit the economic, medical, social, and psychological consequences associated with the overdiagnosis and misconceptions regarding this entity.

In conclusion, BE is a rare finding in this non-selected Lebanese population. The prevalence of BE in Lebanon is comparable to that in the Middle East and much lower than that in Western countries. The endoscopic diagnosis of BE is problematic and requires pathological confirmation.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of IRB ID: IM.RB.02.

Informed Consent: N/A.

Peer-review: Externally peer-reviewed.

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