

## The role of hiatal hernia in patients with endoscopic erosive esophagitis

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### ABSTRACT

**Aim:** This study aimed at determining the prevalence of hiatal hernia (HH) in patients with endoscopic erosive esophagitis (EE).

**Background:** Gastro-esophageal reflux disease (GERD) is one of the most common problems all over the world. This may lead to erosive esophagitis. Previous studies have demonstrated that HH has an important role in the pathogenesis of reflux disease. The rising prevalence of GERD among Iranians necessitates more comprehensive studies about the underlying etiologies. This study aimed at determining the prevalence of HH in patients with endoscopic erosive esophagitis (EE).

**Patients and methods:** In a case-control setting, 454 patients with gastrointestinal problems referred to the endoscopy unit of Tabriz Imam Hospital were evaluated during a 24-month period. Two hundred and twenty seven patients determined to have EE and 227 patient with non-ulcer dyspepsia (NUD) enrolled as the control group. The presence of HH was assessed during the endoscopic procedure. The possible risk factors for EE also elucidated.

**Results:** HH was confirmed in 94.3% of the case group comparing with the rate of 30% in the controls (OR=38.49, 95%CI: 20.55-72.11;  $p<0.001$ ). The male patients were significantly dominant in the case group (130 patients vs. 92 patients;  $p<0.001$ ). The presence of HH was an independent risk factor for the EE. The age of patients with EE and concurrent HH was significantly lower than that in the patients without it (42.13 years vs. 55.08 years;  $p=0.001$ ). There was no significant relation between the presence of HH and the gender of patients with EE.

**Conclusion:** This study showed that HH is a common concomitant finding in patients suffering from heartburn due to EE. Thus considering this pathological entity is necessary, especially in younger patients.

**Keywords:** *Hiatal hernia, Esophagitis, Endoscopy.*

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### INTRODUCTION

Nowadays, gastroesophageal reflux disease (GERD) is one the most common problems all over the world. It is believed that the interference of the disease with the quality of life is almost equal to irritable bowel syndrome (IBS). This idea that the disease in developing countries is not as prevalent as in the western counterparts is

challenged (1, 2). A recent study in Iran has proved that the incidence of the GERD has dramatically increased during the past decades. It has been suggested that it may be partly due to the changes in nutritional behavior or so-called westernization in the country. However it is not a fully justifiable cause (3). In some circumstances, it is proposed that infection with helicobacter pylori may provide a protective effect against GERD (4, 5). The infection rate has also been reported to be very high even among normal

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Iranian population (6, 7). In a normal person, the principle antireflux mechanisms include presence of a normally-acting lower esophageal sphincter (LES) and diaphragmatic crura, and anatomical position of gastroesophageal junction beneath the diaphragmatic hiatus. So, it is clear that insufficiency of diaphragmatic crura may lead into GERD, a pathological condition which is seen in hiatal hernia (1). It has been shown that the presence of hiatal hernia accompanied with symptoms of GERD would increase the incidence of esophagitis, Barrett's esophagus and esophageal adenocarcinoma (2). This study aimed at evaluating the prevalence of hiatal hernia in patients with endoscopic erosive esophagitis and investigating a possible relation between these two conditions.

## PATIENTS and METHODS

In a case-control study, 227 patients with endoscopically-proven erosive esophagitis (EE) (as the case group) and 227 patients with dyspepsia without heartburn (non-ulcer dyspepsia) and candidates for upper endoscopy (as the control group) were enrolled during 24 months (2006-2008) in Imam Hospital, Tabriz- Iran. Endoscopic exploration of hiatal hernia was performed during the same session of the primary evaluation of the patients. A distance of more than 2.5 centimeter between Z-line and location of diaphragmatic pressure on the gastric mucosa was defined as the presence of hiatal hernia (HH). Retroversion maneuver (observation of the cardia from inside

the stomach) was employed for confirming of HH. Los Angeles grading system was used for determining the severity of esophagitis:

Grade A: Mucosal break < 5 mm in length; Grade B: Mucosal break > 5mm; Grade C: Mucosal break continuous between > 2 mucosal folds; Grade D: Mucosal break > 75% of esophageal circumference (8).

The age of patients in this study was 18 years and older. Patients with esophageal tumors, gastric adenocarcinoma, gastric outlet obstruction, peptic ulcer, and who had recurrent vomiting were excluded from the study. The ethics committee of Tabriz University of Medical Sciences approved this study. Indication of upper endoscopy was determined according to accepted guidelines as follows: patients' age  $\leq$  45 years and presence of alarming signs or symptoms, such as weight loss, dysphagia, anemia, etc., and/or presence of untreatable dyspepsia, and also patients' age > 45 years and unknown etiology for dyspepsia after thorough clinical examination (9).

Data were analyzed with the SPSS statistical software package (version 15.0; SPSS Inc, Chicago). Receiver operating characteristic (ROC) curve coordinates were used for determining optimal cut-off points. Continuous variables were expressed as mean and standard deviation, and categorical data were shown as frequency and percent. The contingency table (the Chi square and the Fisher's exact tests where appropriate) and student T-test were employed for comparisons. A p-value less than 0.05 was considered significant.

**Table 1-** Characteristics of patients with and without erosive esophagitis

variable	With erosive esophagitis	Without erosive esophagitis	OR*	Confidence interval
Age (year)	42.87 $\pm$ 14.02	40.70 $\pm$ 13.32	-	-
Gender (male)	130 (57.3%)	92 (40.5%)	1.97	1.35-2.85
NSAIDs <sup>†</sup> use	17 (7.5%)	7 (3.1%)	2.56	1.03-6.26
Alcohol use	8 (3.5%)	3 (1.3%)	-	0.71-10.4
Smoking use	36 (15.9%)	22 (9.7%)	1.76	0.99-3.09
Hiatal hernia	214 (94.3%)	68 (30%)	38.49	20.5-72.1

\* Odds ratio; <sup>†</sup> Non-steroidal anti inflammatory drugs

**Table 2-** Characteristics of patients with erosive esophagitis with and without hiatal hernia

Variable	With hiatal hernia	Without hiatal hernia	p-value
Age (year)	42.13±13.74	55.08±13.34	0.001
Gender (male)	121 (57.3%)	9 (40.5%)	NS*
NSAIDs <sup>†</sup> use	16 (7.5%)	1 (7.7%)	NS
Alcohol use	7 (3.3%)	1 (7.7%)	NS
Hx of smoking	34 (15.9%)	2 (15.4%)	NS
Grade of esophagitis			NS
A	167 (78%)	10 (76.9%)	
B	45 (21%)	3 (23.1%)	
C	1 (0.5%)	-	
D	1 (0.5%)	-	

\* Not significant; <sup>†</sup> Non-steroidal anti inflammatory drugs

## RESULTS

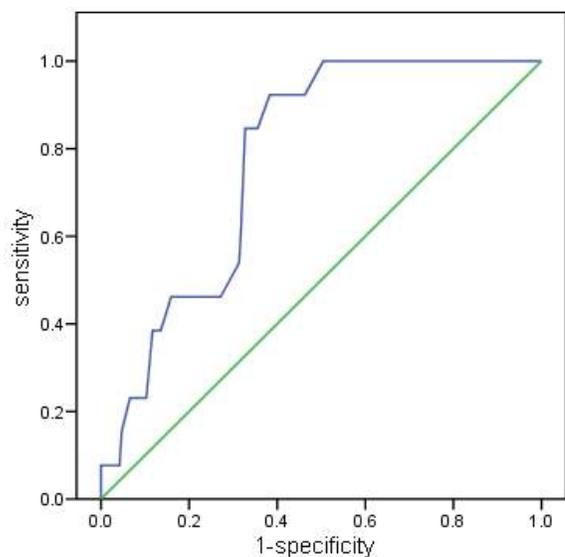
227 patients with endoscopically-proven erosive esophagitis (EE) and 227 patients with dyspepsia without heartburn (non-ulcer dyspepsia) and candidates for upper endoscopy were studied. Variables and characteristics of patients in two groups are summarized in table 1.

Accordingly, frequency of male gender, positive history of taking NSAIDs, positive history of smoking and frequency of hiatal hernia were significantly higher in the case group comparing with the controls. In multivariate study, the predominance of male gender ( $p= 0.066$ ), history of taking NSAIDs ( $p= 0.132$ ) and positive history of smoking ( $p= 0.414$ ) in the case group was not reconfirmed. The sole significantly independent risk factor for EE was presence of hiatal hernia in this analysis ( $p< 0.001$ ). In the case group, variables and characteristics of patients with and without hiatal hernia are summarized in table 2.

Accordingly, age of patients with hiatal hernia was significantly lower than patients without this condition ( $p= 0.001$ ). The optimal cut-off point was calculated about 46 years with a sensitivity of 85%; i.e. almost 85% of patients with EE and younger than 46 years are predicted to have concomitant hiatal hernia (figure 1).

## DISCUSSION

In this study, we determined the frequency of hiatal hernia in patients with endoscopically-proven erosive esophagitis. Comparing with controls, frequency of hiatal hernia was significantly higher in patients with EE (94.3% vs. 30%; OR= 38.49,  $p< 0.001$ ). In addition, frequency of males was significantly higher in the case group. In multivariate analysis; however, the hiatal hernia was the only significant and independent predictor of EE.



**Figure 1-** Receiver operator characteristics curve of age in predicting hiatal hernia in patients with erosive esophagitis hernia.

In different studies, prevalence of hiatal hernia among patients with EE ranges between 7.7 and 81 percent (10-14). Accordingly, frequency of hiatal hernia in our patients with EE is higher than other reports. Different justifications might be proposed for wide range of results in diverse studies. Different sample sizes and employed methods for detecting EE and hiatal hernia may be the reasons. Age of studied patients could influence the results, as well. Gilger et al. reported very low incidence of hiatal hernia in children with EE (13). Previously it had been shown that increasing age is accompanied with higher rates of hiatal hernia. It seems that predisposing factors for hiatal hernia are chronic entities which are not evolved in early life. In addition, other risk factors such as pregnancy are commonly found during adulthood (15). Different studies have confirmed the causative relation of hiatal hernia and GERD (16-21). Our result is in line with these reports. In this study, we did not find any relation between presence of hiatal hernia and severity of EE according to Los Angeles grading system. Three similar studies also could not find any relation between hiatal hernia and severity of EE (10, 12, 22). So, apparently hiatal hernia is just a risk factor for EE without affecting the severity of the disease. However, it should be mentioned that in our series and other similar studies, enough numbers of patients with severe esophagitis have not been met; so further studies with larger sample size of these types may be helpful. In the current study, we showed that the probability of presence of hiatal hernia as an underlying cause of EE is higher in younger patients (< 46 years). To our knowledge, there is no study similar to this present one in this regard. In conclusion, it is recommended that the hiatal hernia should be born in mind as a potent risk factor for EE, especially in younger patients.

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