Gender-Specific Risk Factors for Reflux Esophagitis in a Predominantly Hispanic Population of a Large Safety-Net Hospital

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Abstract

Background  Defining factors associated with severe reflux esophagitis allows for identification of subgroups most at risk for complications of strictures and esophageal malignancy. We hypothesized there might be unique clinical features in patients with reflux esophagitis in a predominantly Hispanic population of a large, safety-net hospital.

Aim  Define clinical and endoscopic features of reflux esophagitis in a predominantly Hispanic population of a large, safety-net hospital.

Methods  This is retrospective comparative study of outpatients and hospitalized patients identified with mild (Los Angeles Grade A/B) and severe (Los Angeles Grade C/D) esophagitis through an endoscopy database review. The electronic medical record was reviewed for demographic and clinical data.

Results  Reflux esophagitis was identified in 382/5925 individuals: 56.5% males and 79.8% Hispanic. Multivariable logistic regression model adjusted for age, gender, race, body mass index (BMI), tobacco and alcohol use, and hospitalization status with severity as the outcome showed an interaction between gender and BMI ($p \leq 0.01$). Stratification by gender showed that obese females had decreased odds of severe esophagitis compared to normal BMI females (OR = 0.18, 95% CI = 0.07-0.47; $p < 0.01$). In males, the odds of esophagitis were higher in inpatient status (OR = 2.84, 95% CI = 1.52 − 5.28; $p < 0.01$) and as age increased (OR = 1.37, 95% CI = 1.03 − 1.83; $p = 0.03$).

Conclusions  We identify gender-specific associations with severe esophagitis in a predominantly Hispanic cohort. In females, obese BMI appears to be protective against severe esophagitis compared to normal BMI, while in men inpatient status and increasing age were associated with increased odds of severe esophagitis.

Keywords  Esophagitis · Obesity · Female · Gender · Hispanic

Introduction

Gastroesophageal reflux disease (GERD) affects over 20% of American adults, and the burden of disease appears to be increasing worldwide [1]. GERD-related esophagitis can lead to additional complications such as strictures and Barrett’s esophagus, the only known precursor of esophageal adenocarcinoma [2]. Identification of risk factors for severe esophagitis can help identify populations most at risk for these complications and allow for proper allocation of limited endoscopic resources.

Male gender [3, 4], Caucasian ethnicity [3–5], and obesity [3, 4, 6, 7] have previously been identified as risk factors for severe esophagitis (Los Angeles classification Grades C, D). However, reports about the role of obesity and its association with GERD and its complications have been contradictory [6, 8–11]. Further, the applicability of reported risk
factors for severe esophagitis in the vulnerable population served by a safety-net hospital or in the burgeoning Hispanic population is unknown. We were therefore interested in exploring risk factors for severe esophagitis in this population. Our aim was to determine clinical and endoscopic features of reflux esophagitis and to identify risk factors for reflux esophagitis in the predominantly Hispanic population of a large, safety-net hospital. Understanding risk factors for severe esophagitis in a potentially vulnerable population provides the opportunity to identify subgroups most at risk for complication of GERD.

Materials and Methods

Study Design and Population

A retrospective comparative study was designed to examine the clinical and endoscopic characteristics of mild and severe esophagitis. The study population was comprised of outpatients and inpatients who underwent esophagogastroduodenoscopy (EGD) at the endoscopy suite at Los Angeles County Hospital (LAC) between January 2017 and December 2018 and were identified with esophagitis through an endoscopy database review. In patients who underwent multiple endoscopies during the time period of the study, only the first one was recorded. LAC is a multidisciplinary teaching hospital affiliated with the University of Southern California and is a safety-net hospital for underserved patients. The study was approved by the University of Southern California Institutional Review Board. All authors had access to the study data and reviewed and approved the final manuscript prior to submission.

Data Collection

The electronic medical record was reviewed for demographic and clinical data. Demographic data collected included age, sex, and ethnicity/race. Tobacco and alcohol use were also recorded based on chart review. Clinical data included body mass index (BMI), hospitalization status, listed medications, comorbidities, and indications for endoscopy. BMI was calculated from data extracted from the chart at the time of endoscopy. BMI was calculated by dividing weight (kg) by height squared (m$^2$) at the time of endoscopy and was categorized as underweight (< 18.5 kg/m$^2$), normal (18.5–24.9 kg/m$^2$), overweight (25–29.9 kg/m$^2$), and obese (≥ 30 kg/m$^2$). Endoscopy reports were reviewed for the presence of hiatal hernia, strictures, or Barrett’s esophagus. Esophagitis severity was defined according to the Los Angeles (LA) classification as A, B, C, or D and was dichotomized into two populations a priori. Those with Los Angeles Grade A/B were classified as mild esophagitis and those with Grade C/D as severe esophagitis [4]. Endoscopic images were reviewed to confirm the LA classification and for the presence of stricture or hiatal hernia or Barrett’s esophagus. We excluded non-erosive disease and Barrett’s esophagus, focusing only on erosive esophagitis as a complication of GERD.

Statistical Analysis

The median and interquartile ranges (IQR) were reported for continuous variables that were not normally distributed, and the frequency counts and percentages were reported for the categorical variables. A Wilcoxon test was performed to assess whether continuous variables differed by severity, and a Chi-square test or Fisher’s exact test was performed to assess whether the categorical variables differed by severity. Similar methods were used to assess indication for endoscopy, endoscopy findings, and medication. Subgroup analyses were also performed to observe the differences in baseline characteristics by severity groups for inpatients, outpatients, males, and females. A multivariable logistic regression was performed on severity outcome adjusting for age, gender, race, BMI, tobacco use, alcohol use, and hospitalization status. Due to the interaction of BMI and gender, analyses were stratified by gender. The odds ratio, 95% confidence interval, and $p$ values were reported. Age was reported as 10-year increments. Significance tests were two-tailed, with $\alpha = 0.05$. All analyses were performed using SAS software v. 9.4 (SAS Institute Inc.).

Results

Baseline Characteristics of Patients

Reflux esophagitis was identified in 382 individuals out of 5925 upper endoscopies (6.4%) at our institution; 56.5% were males and 43.5% female (Table 1). The median age was 55.6 years. Most patients (79.8%) were Hispanic, followed by 8.4% Caucasian, 5.8% African American, and 6.0% other (Korean, Chinese, and Filipino). There were 64.7% of esophagitis cases identified during outpatient endoscopy, and 35.3% were identified during inpatient endoscopy.

There were 59% ($n = 225$) of esophagitis cases that were mild and 41% ($n = 157$) of cases that were severe. The median ages of those with mild and severe esophagitis were 56 and 58 years old, respectively ($p = 0.05$). Patients with mild esophagitis were 52% male and 48% female, while those with severe esophagitis were 63.1% male and 36.9% female ($p = 0.03$). Hospitalization status significantly differed between severity groups ($p < 0.01$). There was a higher percentage of outpatients in the mild group (74.2% vs. 25.8%) and a similar distribution of outpatients and
inpatients in the severe group (52% vs. 49%). There were no significant differences in tobacco and alcohol use in mild vs severe esophagitis.

The majority of individuals in our cohort were either obese or overweight (n = 269, 70.4%). BMI categories differed between the severity groups (p < 0.01). There was a higher distribution of underweight and normal weight patients in the severe group compared to the mild group (7.7% vs. 2.7% and 32.1% vs. 19.6%, respectively), and a higher percentage of obese patients in the mild group compared to the severe group (41.8% vs. 22.4%).

### Comorbidities and Indications for Endoscopy

A number of listed comorbidities were captured during the time period of the study (Table 2). Comorbidities were not mutually exclusive, and a patient may have reported multiple indications. The primary indications for endoscopy in all patients were gastrointestinal bleeding (n = 98), followed by surveillance for history of esophagitis (n = 80), iron-deficiency anemia (n = 68), dysphagia/odynophagia (n = 58), reflux/regurgitation (n = 53), and abdominal pain (n = 45) (Table 3). Nausea/vomiting (n = 25), abnormal imaging (n = 21), and other (n = 19) were remaining indications. In those with mild esophagitis, the most frequent indication for endoscopy was a surveillance endoscopy for a prior history of esophagitis (25.3%). In those with severe esophagitis, gastrointestinal bleeding (35%) was the most frequent indication. Gastrointestinal bleed (35% vs. 19.1%, p < 0.01), dysphagia (22.9% vs. 9.8%, p < 0.01), and nausea/vomiting (10.2% vs. 4%,

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**Table 1** Baseline characteristics of patients with Grade A/B and C/D esophagitis

| Characteristics | All (N = 382) Median (IQR) | Grade A/B (N = 225) Median (IQR) | Grade C/D (N = 157) Median (IQR) | p value |
|-----------------|-----------------------------|-----------------------------------|-----------------------------------|---------|
| Age             | 55.6 (50, 62)               | 56 (48, 62)                       | 58 (51, 63)                       | 0.05    |
| Gender          |                             | N (%)                             | N (%)                             |         |
| Male            | 216 (56.5)                  | 117 (52.0)                        | 99 (63.1)                         | 0.03    |
| Female          | 166 (43.5)                  | 108 (48.0)                        | 58 (36.9)                         |         |
| Race            |                             |                                   |                                   | 0.17    |
| Hispanic        | 305 (79.8)                  | 185 (82.2/60.7)                   | 120 (76.4/39.3)                   |         |
| Non-Hispanic    | 77 (20.2)                   | 40 (17.8/52.0)                    | 37 (23.6/48.1)                    |         |
| BMI             |                             |                                   |                                   | <0.01   |
| Underweight     | 18 (4.7)                    | 6 (2.7)                           | 12 (7.7)                          |         |
| Normal          | 94 (24.6)                   | 44 (19.6)                         | 50 (32.1)                         |         |
| Overweight      | 140 (36.7)                  | 84 (36.0)                         | 59 (37.82)                        |         |
| Obese           | 129 (33.8)                  | 94 (41.8)                         | 35 (22.4)                         |         |
| Tobacco use     |                             |                                   |                                   | 0.05    |
| Current         | 79 (20.7)                   | 41 (18.2)                         | 38 (24.2)                         |         |
| Former          | 73 (19.1)                   | 37 (16.4)                         | 36 (22.9)                         |         |
| Never           | 230 (60.2)                  | 147 (65.3)                        | 83 (52.9)                         |         |
| Alcohol use     |                             |                                   |                                   | 0.06    |
| Current         | 113 (29.6)                  | 62 (27.6)                         | 51 (32.5)                         |         |
| Former          | 84 (22.0)                   | 43 (19.1)                         | 41 (26.1)                         |         |
| Never           | 185 (48.4)                  | 120 (53.3)                        | 65 (41.4)                         | <0.01   |
| Hospitalization status |          |                                   |                                   |         |
| Inpatient       | 135 (35.3)                  | 58 (25.8)                         | 77 (49.0)                         |         |
| Outpatient      | 247 (64.7)                  | 167 (74.2)                        | 80 (51.0)                         |         |

Note: Missing data: BMI (n = 1). Percent may not equal 100 due to rounding.

*N (numerator = column percentage/denominator = row percentage)*
were more frequent indications for endoscopy in severe versus mild esophagitis. There was a higher rate of surveillance endoscopy in mild esophagitis patients compared to severe esophagitis patients (25.3% vs. 14.7%, \( p = 0.01 \)). The remainder of indications for endoscopy was similar between mild and severe esophagitis.

### Endoscopic Findings

The most common endoscopic finding overall was hiatal hernia (\( n = 191, 50\% \)) (Table 4). First time and repeat endoscopies accounted for nearly 70% and 30% of procedures, respectively. Hiatal hernia (58.6% vs. 44%, \( p < 0.01 \)) and esophageal strictures (11.5% vs. 4%, \( p = 0.01 \)) were more frequent indications for endoscopy in severe versus mild esophagitis. There was a higher rate of surveillance endoscopy in mild esophagitis patients compared to severe esophagitis patients (25.3% vs. 14.7%, \( p = 0.01 \)). The remainder of indications for endoscopy was similar between mild and severe esophagitis.

### Table 2 Comorbidities of patients with Grade A/B and C/D esophagitis

| Comorbidities  | All (\( N = 382 \)) | Grade A/B (\( N = 225 \)) | Grade C/D (\( N = 157 \)) | \( p \) value |
|----------------|---------------------|--------------------------|--------------------------|--------------|
| No comorbidity | 82 (21.5)           | 49 (21.8)                | 33 (21.0)                | 0.86         |
| GERD           | 127 (33.2)          | 67 (29.8)                | 60 (38.2)                | 0.09         |
| CAD            | 16 (4.2)            | 11 (4.9)                 | 5 (3.2)                  | 0.41         |
| COPD           | 12 (3.2)            | 7 (3.1)                  | 5 (3.2)                  | >0.99        |
| PVD            | 7 (1.8)             | 4 (1.8)                  | 3 (1.9)                  | >0.99        |
| OSA            | 13 (3.4)            | 11 (4.9)                 | 2 (1.3)                  | 0.06         |
| Diabetes       | 112 (29.3)          | 72 (32.0)                | 40 (25.5)                | 0.17         |
| Malignancy     | 59 (15.4)           | 36 (16.0)                | 23 (14.7)                | 0.72         |
| Cirrhosis      | 51 (13.3)           | 29 (12.9)                | 22 (14.0)                | 0.75         |
| CKD            | 74 (19.4)           | 52 (23.1)                | 22 (14.0)                | 0.03         |

*Note: Percent may not equal 100 due to rounding. Comorbidities are not mutually exclusive.*

GERD, gastroesophageal reflux disease; CAD, coronary artery disease; COPD, chronic obstructive pulmonary disease; PVD, peripheral vascular disease; OSA, obstructive sleep apnea; CKD, chronic kidney disease

### Table 3 Indications for endoscopy in patients with Grade A/B and C/D esophagitis

| Indication for endoscopy | All (\( N = 382 \)) | Grade A/B (\( N = 225 \)) | Grade C/D (\( N = 157 \)) | \( p \) value |
|--------------------------|---------------------|--------------------------|--------------------------|--------------|
| Gastrointestinal bleeding| 98 (25.7)           | 43 (19.1)                | 55 (35.0)                | <0.01        |
| Dysphagia/odynophagia    | 58 (15.2)           | 22 (9.8)                 | 36 (22.9)                | <0.01        |
| GERD                     | 53 (13.9)           | 37 (16.5)                | 16 (10.2)                | 0.08         |
| Nausea/vomiting          | 25 (6.5)            | 9 (4.0)                  | 16 (10.2)                | 0.02         |
| Iron-deficiency anemia   | 68 (17.8)           | 37 (16.4)                | 31 (19.8)                | 0.41         |
| Abdominal pain           | 45 (11.8)           | 27 (12.0)                | 18 (11.5)                | 0.87         |
| Surveillance             | 80 (20.9)           | 57 (25.3)                | 23 (14.7)                | 0.01         |
| Abnormal imaging         | 21 (5.5)            | 14 (6.2)                 | 7 (4.5)                  | 0.46         |
| Other                    | 19 (5.0)            | 13 (5.8)                 | 6 (3.8)                  | 0.39         |

*Note: Percent may not equal 100 due to rounding. Indications are not mutually exclusive. Other category consists of screening for varices and malignancy work-up.*

### Table 4 Endoscopy findings in patients with Grade A/B and C/D esophagitis

| Endoscopy findings | All (\( N = 382 \)) | Grade A/B (\( N = 225 \)) | Grade C/D (\( N = 157 \)) | \( p \) value |
|--------------------|---------------------|--------------------------|--------------------------|--------------|
| Hiatal hernia      | 191 (50.0)          | 99 (44.0)                | 92 (58.6)                | <0.01        |
| GOO                | 7 (1.8)             | 2 (0.9)                  | 5 (3.2)                  | 0.13         |
| Esophageal strictures | 27 (7.1)         | 9 (4.0)                  | 18 (11.5)                | 0.01         |
| EGD                | 115 (30.1)          | 59 (26.2)                | 56 (35.7)                | 0.05         |

*Note: Percent may not equal 100 due to rounding. Endoscopy findings are not mutually exclusive.*
frequent in severe than mild esophagitis. Endoscopy findings were not mutually exclusive, and a patient may have reported multiple findings.

**Medication Use**

Proton-pump inhibitor use was similar per review of the electronic medical record between mild (44.9%, n = 101) and severe esophagitis (48.4%, n = 76) (Table 5). Other medications that were recorded included H2 antagonists, aspirin, clopidogrel, NSAIDs, and corticosteroids. Patients may have been on multiple medications. Clopidogrel was reported in eight patients with mild esophagitis, and there was no clopidogrel use in cases of severe esophagitis (p = 0.02). Other medication use between groups was similar.

**Hospitalization Status and Esophagitis Severity**

The diagnosis of esophagitis in our endoscopy database reflected a heterogeneous population of inpatients and outpatients, which recent reports suggest may have distinct disease pathogenesis [10]. We therefore evaluated characteristics of outpatients and inpatients separately.

Among 247 patients diagnosed with esophagitis as outpatients, 51.4% were male and 67.6% had mild esophagitis, while 32.4% had severe esophagitis (Table 6). Obese BMI was reported in 41.3% of outpatients with esophagitis. BMI categories differed between outpatients with mild and severe esophagitis (p < 0.01). Outpatients with severe esophagitis had a higher percentage of patients with underweight, normal weight, and overweight BMI compared to those with mild esophagitis, while those with mild esophagitis had a higher percentage of patients with obese BMI.

Among 135 cases of inpatient esophagitis, 65.9% were male and 43.0% had mild esophagitis and 57.0% had severe esophagitis (Table 7). There were no significant differences in baseline characteristics between mild and severe esophagitis groups.

**Gender and Severity of Esophagitis**

We were then interested in examining baseline characteristics in our population by gender and by severity of esophagitis (Table 8). In males, the median age in severe patients was higher than in mild patients (p = 0.03). Females with mild esophagitis had a higher median age.

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**Table 5** Medication use in patients with Grade A/B and C/D esophagitis

| Medication       | All (N=382) | Grade A/B (N=225) | Grade C/D (N=157) | p value |
|------------------|-------------|-------------------|-------------------|---------|
| PPI              | 177 (46.3)  | 101 (44.9) N (%)  | 76 (48.4)         | 0.50    |
| H2RA             | 49 (12.8)   | 25 (11.1)         | 24 (15.3)         | 0.23    |
| PPI + H2RA       | 31 (8.1)    | 17 (7.6)          | 14 (8.9)          | 0.63    |
| Aspirin          | 86 (22.5)   | 56 (24.9)         | 30 (19.1)         | 0.18    |
| Clopidogrel      | 8 (2.1)     | 8 (3.6)           | 0 (0)             | 0.02    |
| NSAIDs           | 56 (14.7)   | 35 (15.6)         | 21 (13.4)         | 0.55    |
| Corticosteroids  | 12 (3.1)    | 6 (2.7)           | 6 (3.8)           | 0.56    |
| Other medication associated with pill esophagitis | 27 (7.1) | 18 (8.0) | 9 (5.7) | 0.39 |

*Note* Percent may not equal 100 due to rounding. Medications are not mutually exclusive.
than males with mild esophagitis ($p=0.03$). There was no difference in the median ages of females and males with severe esophagitis.

BMI differed in females with mild versus severe esophagitis ($p<0.01$). More than half the female patients with mild esophagitis had an obese BMI (55.6%), while 17.5% of females with severe esophagitis had an obese BMI. There was no statistical difference between BMI and severity groups within males.

Race/ethnicity was similar across esophagitis severity in males and females, with most patients being Hispanic. Men reported more current/former alcohol and tobacco use than females in mild ($p<0.01$) and severe ($p<0.01$) esophagitis. However, there was no difference in tobacco or alcohol exposure within either gender in mild versus severe esophagitis. Esophagitis severity differed by hospital status for both females ($p=0.01$) and males ($p<0.01$). For both genders, there was a higher percentage of outpatient hospitalization among mild esophagitis patients compared to severe patients (females: 78.7% vs. 60.3%, males: 70.1% vs. 45.5%).

### Discussion

To our knowledge, this is one of a few cohort studies examining risks for esophagitis severity in a predominantly Hispanic population of a large safety-net hospital that included similar numbers of males and females. Previous studies examining complications of gastroesophageal reflux disease have been skewed toward males and/or did not have significant Hispanic representation [5, 10]. Multivariable logistic regression stratified by gender identified gender-specific risks in this unique population. Females with obese BMI had decreased odds of severe esophagitis compared to normal BMI females after adjusting for all other variables. Inpatient status and increasing age were associated with increased odds of severe esophagitis in males only.

Our results are consistent with multiple epidemiologic studies that reported erosive esophagitis was more predominant in males [12]. This difference has been hypothesized to be due to the more truncal distribution of body fat in men compared to the visceral distribution in women. We did not evaluate distribution of body fat in this study. Epidemiologic studies also suggest that severity of erosive esophagitis is related to the reproductive hormone status in women and may be increased in the postmenopausal state [12]. We did not record menstrual status in this study. However, we did look at age in mild vs severe esophagitis. In our study, there was a not a significant difference in the age of women with severe vs mild esophagitis. Future studies and analysis will address menopausal state and use of hormone replacement therapy. Interestingly, in our cohort, age was associated with an increased odds ratio of severe esophagitis in males only (Table 7).

Our work adds to the complexity of the existing literature regarding the role of obesity in the pathogenesis of...
esophagitis. For example, overweight and obesity as defined by BMI have been reported as risk factors for GERD symptoms and esophageal erosions in a cross-sectional study consisting of surveys followed by endoscopy [6]. A more recent study looked at the effect of ethnicity and gender on the association between erosive esophagitis and obesity [8]. This case control study of outpatients that were 43% Hispanics showed overweight and obese subjects were more likely to have erosive esophagitis than individuals with normal BMI. The effect of BMI on erosive esophagitis did not appear to vary by race/ethnicity or gender. As noted by the authors, however, the risk of erosive esophagitis with a BMI of 35–39.9 kg/m² was lower than those with a BMI of 30–34.9 kg/m². Further, although an increased OR of erosive esophagitis with obesity was reported in both males and females, the severity of esophagitis (i.e., mild vs. severe) was not considered in this study [8]. A meta-analysis of twenty-one studies demonstrated a strong association with increasing BMI and erosive esophagitis in males, but not females [9], while the converse was found in a case-control study [11]. Finally, a retrospective study in a Chinese population demonstrated a positive association between obesity and erosive esophagitis [13].

Although a previous study has reported the association of lower BMI with more severe esophagitis, the population consisted predominantly of White and African American males, with the majority of cases of severe esophagitis made in hospitalized patients [10]. Our patient population was predominantly Hispanic, included similar numbers of males and females, with similar number of cases of severe esophagitis in outpatients and inpatients. Our results showed inpatient hospitalization was associated with an increased OR for severe esophagitis in males only. This finding is consistent with previous reports [10] although it is not clear why inpatient status was not associated with an increased OR of severe esophagitis in females.

There are several limitations to our work. The retrospective nature and its basis on an endoscopy database make the results subject to selection bias. Although “surveillance” was listed as an indication more frequently in mild versus

| Characteristics   | Female | Male | p valuea | p valueb | p valuec | p valued |
|-------------------|--------|------|----------|----------|----------|----------|
| Age               |        |      | 0.28     | 0.03     | 0.03     | 0.20     |
| Race              |        |      | 0.42     | 0.47     | 0.01     | 0.07     |
| Hispanic          | 96 (88.9) | 49 (84.5) | 89 (76.1) | 71 (71.7) |          |          |
| Non-Hispanic      | 12 (11.1) | 9 (15.5) | 28 (23.9) | 28 (28.3) |          |          |
| BMI               |        |      | <0.01    | 0.11     | <0.01    | 0.71     |
| Underweight       | 3 (2.8) | 5 (8.8) | 3 (2.6) | 7 (7.1)  |          |          |
| Normal            | 20 (18.5) | 20 (35.1) | 24 (20.5) | 30 (30.3) |          |          |
| Overweight        | 25 (23.2) | 22 (38.6) | 56 (47.9) | 37 (37.4) |          |          |
| Obese             | 60 (55.6) | 10 (17.5) | 34 (29.1) | 25 (25.3) |          |          |
| Tobacco use       |        |      | 0.72     | 0.23     | <0.01    | <0.01    |
| Current           | 12 (11.1) | 8 (13.8) | 29 (24.8) | 30 (30.3) |          |          |
| Former            | 10 (9.3) | 7 (12.1) | 27 (23.1) | 29 (29.3) |          |          |
| Never             | 86 (79.6) | 43 (74.1) | 61 (52.1) | 40 (40.4) |          |          |
| Alcohol use       |        |      | 0.39     | 0.56     | <0.01    | <0.01    |
| Current           | 16 (14.8) | 9 (15.5) | 46 (39.3) | 42 (42.4) |          |          |
| Former            | 8 (7.4) | 8 (13.8) | 35 (29.9) | 33 (33.3) |          |          |
| Never             | 84 (77.8) | 41 (70.7) | 36 (30.8) | 24 (24.2) |          |          |
| Hospitalization   |        |      | <0.01    | <0.01    | 0.14     | 0.07     |
| Inpatient         | 23 (21.3) | 23 (39.7) | 35 (29.9) | 54 (54.6) |          |          |
| Outpatient        | 85 (78.7) | 35 (60.3) | 82 (70.1) | 45 (45.5) |          |          |

Note: Missing data: BMI (n = 1). Percent may not equal 100 due to rounding

aP values are for mild versus severe within females
bP values are for mild versus severe within males
cP values are for female versus males within mild esophagitis
dP values are for females versus males within severe esophagitis
In conclusion, this retrospective study aimed to identify unique characteristics of esophagitis in a predominantly Hispanic population of a large safety-net hospital with significant male and female representation. In males, there was an association between severity of esophagitis with age and hospitalization. These results show that previous studies identifying increasing age and inpatient status as risk factors for severe esophagitis are applicable to the predominantly Hispanic males cared for at our safety-net hospital. We also identified an association between severity of esophagitis and BMI in females. Notwithstanding potential limitations of this study, this novel observation merits investigation of the potential mechanisms mediating the observed difference in esophagitis severity in females along the BMI spectrum. Larger studies will also be needed to determine whether this association extends to other ethnicities.

This study was performed in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. For this type of study format, consent is not required.
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Compliance with Ethical Standards

Conflict of interest All authors declared that they have no conflicts of interest.

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