

BRIEF ARTICLES

Comparison of reflux esophagitis and its complications between African Americans and non-Hispanic whites

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Author contributions: Vega KJ and Jamal MM designed the research and analyzed the data, Vega KJ and Chisholm S performed the research, Vega KJ, Chisholm S and Jamal MM wrote the manuscript.

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Received: March 9, 2009 Revised: May 7, 2009

Accepted: May 14, 2009

Published online: June 21, 2009

hiatal hernia are similar in non-Hispanic whites and African Americans. Heartburn was more frequently and nausea/vomiting less frequently reported as the primary endoscopic indication in non-Hispanic whites compared with African Americans with erosive esophagitis or its complications. African Americans have a decreased prevalence of Barrett's esophagus compared with non-Hispanic whites.

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Key words: Reflux esophagitis; African American; Hiatal hernia; Barrett's esophagus

Peer reviewers: Siegfried Wagner, Professor, Medizinische Klinik II, Klinikum Deggendorf, Perlasberger Str. 41, Deggendorf 94469, Germany; Dr. Katerina Dvorak, Research Assistant Professor, Cell Biology and Anatomy, The University of Arizona, 1501 N. Campbell Ave, Tucson 85724, United States

Abstract

AIM: To determine the effect of ethnicity on the severity of reflux esophagitis (RE) and its complications.

METHODS: A retrospective search of the endoscopy database at the University of Florida Health Science Center/Jacksonville for all cases of reflux esophagitis and its complications from January 1 to March 31, 2001 was performed. Inclusion criteria were endoscopic evidence of esophagitis using the LA classification, reflux related complications and self-reported ethnicity. The data obtained included esophagitis grade, presence of a hiatal hernia, esophageal ulcer, stricture and Barrett's esophagus, and endoscopy indication.

RESULTS: The search identified 259 patients with RE or its complications, of which 171 were non-Hispanic whites and 88 were African Americans. The mean ages and male/female ratios were similar in the two groups. RE grade, esophageal ulcer, stricture and hiatal hernia frequency were likewise similar in the groups. Barrett's esophagus was present more often in non-Hispanic whites than in African Americans (15.8% vs 4.5%; $P < 0.01$). Heartburn was a more frequent indication for endoscopy in non-Hispanic whites with erosive esophagitis than in African Americans (28.1% vs 7.9%; $P < 0.001$).

CONCLUSION: Distribution of RE grade and frequency of reflux-related esophageal ulcer, stricture and

Vega KJ, Chisholm S, Jamal MM. Comparison of reflux esophagitis and its complications between African Americans and non-Hispanic whites. *World J Gastroenterol* 2009; 15(23): 2878-2881 Available from: URL: <http://www.wjgnet.com/1007-9327/15/2878.asp> DOI: <http://dx.doi.org/10.3748/wjg.15.2878>

INTRODUCTION

Multiple studies suggest that the frequency of gastroesophageal reflux disease (GERD) complications such as erosive esophagitis, stricture and Barrett's esophagus (BE) is significantly lower in the US minority populations compared with non-Hispanic whites (nHw)^[1-6]. Two studies from Veterans Affairs Medical Centers observed that severe GERD affected older nHw more commonly than non-whites^[2,3]. Both of these investigations used the Department of Veterans Affairs patient treatment file as the data source.

Two groups of investigators have attempted to determine the frequency of GERD complications between ethnic groups seen at their institutions^[7,8]. In one study^[7], African Americans (AA), nHw and Asians significantly differed in heartburn prevalence, while the other^[8] indicated that AA and nHw had equivalent heartburn prevalence rates. Both studies revealed that AA had decreased rates of erosive esophagitis compared with nHw. The prevalence of BE was only assessed in one investigation with the overwhelming majority seen in nHw.

Regarding BE, limited data exists about the prevalence of this entity in the United States minority populations. Initial studies compared non-Hispanic whites with African Americans. These revealed a predominant presence of BE in nHw when compared with AA^[7-9]. In contrast, a report from the National Cancer Institute indicated that the incidence of esophageal adenocarcinoma is increasing in AA^[10]. BE is considered the precursor lesion of esophageal adenocarcinoma, therefore one could speculate that the incidence of BE might also be increasing within the AA population.

There is minimal data evaluating the prevalence of GERD complications in any defined general population other than non-Hispanic whites^[11,12]. The goal of this study is to compare the severity of reflux esophagitis and its complications in AA and nHw patients who underwent endoscopy at our institution.

MATERIALS AND METHODS

Patient population

A retrospective search of the endoscopy laboratory report database was performed to determine the total number of patients having upper gastrointestinal endoscopy (EGD) at the University of Florida Health Science Center/Jacksonville from 1 January to 31 March 2001. Inclusion criteria were endoscopic evidence of reflux esophagitis, esophageal stricture and/or ulcer, BE, and self reported ethnicity. Exclusion criteria were previous diagnostic EGD, history of non-GERD esophageal condition with the potential to cause esophageal injury (acquired immunodeficiency syndrome, esophageal infections, caustic ingestion, and thoracic radiation), and absence of demographic information within the patient record. The study was approved by the Institutional Review Board of the University of Florida Health Science Center/Jacksonville.

Symptom evaluation

Indication for EGD was recorded on the individual reports by all endoscopists. If multiple indications were listed, the first indication listed was used as the primary reason for performing the procedure. Patients with an indication such as follow-up of any previously noted esophageal lesion were not included in the analysis.

Classification of endoscopic findings

Esophagitis was graded using the Los Angeles system^[13,14]. This scheme categorizes mucosal injury as follows: grade A defined as one or more mucosal breaks no longer than 5 mm which do not extend between the tops of two mucosal folds; grade B defined as one or more mucosal breaks more than 5 mm long that do not extend between the tops of two mucosal folds; grade C defined as one or more breaks that are continuous between the tops of two or more mucosal folds but involve < 75% of the esophageal circumference; and grade D defined as one or more mucosal breaks that involve at least 75% of the esophageal circumference. Four-quadrant biopsy specimens were taken at 2 cm intervals from any visible

Table 1 Demographic data of the study population

	AA (n = 88)	nHw (n = 171)
Male/female (%)	38/62	48/52
Age range (yr)	26-101	18-90
Mean age (mean ± SD)	58.5 ± 16.9	55.8 ± 14.5

P = NS for all, NS represents not significant.

length of columnar lined esophagus to assess the presence of histologic BE. Biopsy sections were then stained with Alcian blue to detect the presence of specialized intestinal metaplasia, the characteristic feature of BE.

Esophageal stricture was defined as a narrowing of the esophageal lumen, which either did not allow passage of a 9 mm endoscope or allowed distal passage of the endoscope with difficulty. The length of the narrowing was measured using the 5 cm endoscope length markings as a reference. Hiatal hernia was defined as the presence of gastric mucosa above the level of the esophageal hiatus. The hernia length was measured using the 5 cm markings as a reference. Hiatal hernia length was considered small if < 2 cm, medium from 2 to 5 cm, and large if greater than 5 cm. The hernia was defined as sliding if the stomach re-entered the abdominal cavity during the endoscopy. Esophageal ulcer was defined as an excavation of the esophageal mucosa of at least 3 mm wide. The ulcer margin had to be raised from the base by at least 1 mm. Location of the ulcer was noted as distal, mid or proximal esophagus.

Statistical analysis

All values of esophagitis distribution frequency, presence of stricture, esophageal ulcer, hiatal hernia, BE and procedure indication were reported as percentage present for each group. Student's *t*-test was used for comparisons between groups. Differences between groups will be considered significant if *P* < 0.05. Data analysis was performed using JMP 5.0 for Windows (SAS Institute Inc., Cary, NC).

RESULTS

Demographics of the study population

During the study period, 716 patients had an EGD and 259 of the 716 patients met the criteria for study inclusion. Of the study group, 171 (66%) were nHw and 88 (34%) were AA. Males comprised 48% of the nHw and 38% of the AA groups, respectively. The groups were similar in age and gender distribution (Table 1).

Indication for endoscopy

Table 2 illustrates the indication for EGD between ethnic groups. Heartburn was noted as the primary indication significantly more frequently in nHw than in AA patients (nHw 28.1% and AA 8%; *P* < 0.01). Nausea and/or vomiting were noted significantly more frequently in AA than nHw patients (nHw 2.9% and AA 9%; *P* < 0.04). Other indications for the procedure were similar between ethnic groups.

Table 2 Indication for endoscopy by ethnicity *n* (%)

Indication	88 AA patients	171 nHw patients	<i>P</i> value
Heartburn	7 (8)	48 (28.1)	< 0.001
Dysphagia	14 (15.9)	37 (21.6)	NS
Upper GI bleeding	22 (25)	25 (14.6)	NS
Nausea/vomiting	8 (9.1)	5 (2.9)	< 0.040
Abdominal pain	15 (17)	31 (18.1)	NS
Abnormal X-ray	3 (3.4)	4 (2.3)	NS
Anemia	8 (9.1)	10 (5.9)	NS
Weight loss	4 (4.5)	2 (1.2)	NS
Other	7 (8)	9 (5.3)	NS

Reflux esophagitis grade distribution

Of the 259 patients, 204 had evidence of reflux esophagitis on EGD. Of those with esophagitis, 76 were AA and 128 were nHw. The distribution of esophagitis grade among those with esophagitis in both ethnic groups is illustrated in Table 3. There was no difference observed between the two groups regarding the severity of erosive esophagitis seen.

Prevalence of other esophageal findings

Table 4 demonstrates the prevalence of hiatal hernia and endoscopic complications of GERD observed between ethnic groups. With regard to presence of hiatal hernia, esophageal stricture and ulcer, no difference was observed between the groups. However, endoscopic and histologic BE were present significantly more frequently in nHw than AA patients (endoscopic BE: nHw 15.8% and AA 4.5%, $P < 0.01$; histologic BE: nHw 5.8% and AA 0%, $P < 0.04$).

DISCUSSION

The current study comparing the spectrum of reflux esophagitis between nHw and AA patients was designed to test the hypothesis that reflux esophagitis severity and its complications vary between nHw and AA at EGD. The results indicate that the distribution of severity and reflux related complications, other than BE, are similar between AA and nHw patients. This similarity in reflux esophagitis severity, presence of hiatal hernia and complications of reflux esophagitis (except for BE) observed between ethnic groups has not been previously described^[2,7,8]. Also, the primary indication for the diagnostic procedure (heartburn in nHw and upper GI bleeding in AA) revealed differences between AA and nHw patients not noted previously. Both of these factors provide insight into reflux disease within the United States as a whole and specifically in the African American community.

Similarities and differences in reported GERD symptoms between ethnicities have been reported previously^[7,8]. Spechler and colleagues noted that AA complained, understood and met predefined criteria for heartburn more frequently than was observed in either nHw or Asian patients in the metropolitan Boston area. However, El Serag and associates observed that the occurrence of weekly heartburn and/or regurgitation was no different between AA, nHw and a multiethnic group who were all employees at

Table 3 Distribution of reflux esophagitis grade by ethnicity

Ethnicity	LA classification grade			
	A	B	C	D
AA (%) (<i>n</i> = 76)	63.2	18.4	7.9	10.5
nHw (%) (<i>n</i> = 128)	71.1	12.5	7.0	9.4

$P = NS$.

Table 4 Prevalence of other endoscopic findings by ethnicity *n* (%)

	AA patients	nHw patients	<i>P</i> value
Hiatal hernia	18 (20.4)	39 (22.8)	NS
Stricture	2 (2.2)	10 (5.8)	NS
Ulcer	7 (7.9)	12 (7)	NS
Endoscopic Barrett's esophagus	4 (4.5)	27 (15.8)	< 0.01
Histological Barrett's esophagus	0 (0)	9 (5.3)	0.03

the Houston VA Medical Center. Complicating this further was the use of a survey (GERQ) in the investigation of El Serag *et al* to assess GERD symptoms, which had only been previously validated in nHw or Spaniards^[15,16]. It is well recognized that medical communication differs between AA and nHw^[17]. Using a tool not validated in African Americans might have led to underestimation of the prevalence of reflux symptoms in that group. This is also suggested by the difference in clinical indication for EGD observed between AA and nHw in the present investigation.

The difference observed in the prevalence of endoscopic BE between AA and nHw in the present investigation corresponds with previous reports in the literature^[7,18,19]. The prevalence of histologically confirmed BE among nHw patients is also consistent with the single publication that specifically addressed that issue^[19]. The finding that endoscopic BE was only confirmed in 1/3 of cases strongly supports the need for histology in assessing BE.

There are limitations of this investigation that should be recognized. Only those who were referred and presented for EGD were eligible for inclusion in this study. As suggested by previous reports^[7,8], AA patients may have not been referred for endoscopy as frequently. This could have led to an underestimation of reflux-related endoscopic disease in that group. The effect of obesity was not accounted for in our study. Multiple studies have indicated an association linking increasing body mass index and presence of reflux symptoms in women, in addition to existence of obesity as a likely risk factor in males^[20,21]. A negative association between *H pylori* presence and GERD symptoms is well established^[22]. Unfortunately, biopsies of the antrum were not routinely taken in our study, therefore the presence and impact of *H pylori* colonization could not be adequately assessed.

In summary, the results of this study indicate that AA have a similar distribution of esophagitis severity and complications from GERD when compared with nHw. However, the presence of Barrett's esophagus is more common in nHw than AA. Also, it appears that AA and nHw patients with reflux esophagitis and its complications on endoscopy have different indica-

tions for EGD. The reasons for the observed difference in procedure indication and the development of histologic Barrett's esophagus between racial groups are not currently known. However, our data suggests that ethnicity may influence both symptoms leading to endoscopy and the development of BE, a premalignant change in the esophagus due to GERD. Further ethnic-specific investigations are needed to completely understand the lower prevalence of Barrett's esophagus between African Americans and non-Hispanic whites.

COMMENTS

Background

There is minimal data evaluating the prevalence of gastroesophageal reflux disease (GERD) complications in any United States general population other than non-Hispanic whites (nHw). Presently, it is thought that such complications occur less frequently in African Americans (AA) than non-Hispanic whites.

Research frontiers

Barrett's esophagus is a well-recognized complication of GERD and is the principal risk factor for esophageal adenocarcinoma. It is well known that Barrett's esophagus is more frequently discovered in nHw than in other United States ethnic groups. However, differences in other GERD associated conditions between ethnic groups have not been well evaluated. In this study, the authors demonstrate reflux esophagitis and its complications, except for Barrett's esophagus, occur in an equal distribution between AA and nHw patients.

Innovations and breakthroughs

Recent reports have highlighted discrepancies in the prevalence of Barrett's esophagus. However, minimal data exists on the frequency of reflux esophagitis and its complications in communities with a significant component of African Americans. This is the first study to report that reflux esophagitis and its complications, other than Barrett's esophagus, occur at a similar frequency in nHw and AA. In addition, indication for the index endoscopy appears to be different in the above ethnic groups.

Applications

By understanding GERD and its complications among ethnic groups in the United States, this study might indicate future avenues for investigation to prevent the development of Barrett's esophagus and esophageal adenocarcinoma.

Terminology

Barrett's esophagus is the antecedent neoplastic lesion associated with the development of esophageal adenocarcinoma. Incidence of esophageal adenocarcinoma is 3-4 times more frequent in non-Hispanic whites than African Americans.

Peer review

In this paper the authors evaluated the effect of ethnicity on the severity of reflux esophagitis. It deals with an important subject. However, as an endoscopic study, it is limited by lack of information regarding body mass index, access to medication, type of medication used for GERD and socioeconomic status of the different ethnic groups seen.

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