

Confounding Factors That Lead to Performing an Esophagogastroduodenoscopy (EGD) in Patients Admitted for Gastro-esophageal Reflux Disease

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Background: Gastroesophageal Reflux Disease (GERD) is a common gastrointestinal disorder in the United States. The decision to perform endoscopic evaluation inpatient requires the presence of certain red flag symptoms. A lesser studied aspect of this decision are other factors that may play a part in this decision including demographics. Our study aims to investigate how these factors impact patients admitted for GERD with red flag symptoms who undergo esophagogastroduodenoscopy (EGD).

Methods: A retrospective analysis of the National Inpatient Sample 2001-2013 database where patients with a primary diagnosis of GERD were extracted using International Classification of Diseases, Ninth Revision (ICD-9) codes. Red Flag symptoms including perforation, dysphagia, weight loss, hematemesis, and persistent vomiting were identified with their respective ICD-9 codes. Adjusted logistic regression using red flag symptoms was performed on the demographic data with $\alpha < 0.001$.

Results: After adjusting for the red flag symptoms, the role of demographic variables was assessed to evaluate an odds ratio of performing an EGD. Age and median income did not have a statistically significant role whereas African Americans and Hispanic were more likely to get an EGD compared to Caucasians. Females were less likely to have endoscopic evaluations. Patients admitted on a weekend were more likely to undergo an EGD. Patients outside the northwest region were all more likely to undergo an EGD.

Conclusion: After matching for indications to have an endoscopic evaluation it is evident there are clear differences in patient attributes undergoing EGDs. It's important to understand healthcare disparities that may be present when undergoing such procedures to optimize patient care. Patient admission day had an influence on performing the procedure which may be attributed to availability of schedules or personnel. Understanding the confounding variables in endoscopic evaluations will help decrease patient morbidity and mortality while improving hospital costs and length of stays.

Table 1. Predictors of EGD in Patients Admitted for GERD

Variable	P-Value	Odds Ratio (95% CI)
Age		
19 to 20	Reference	
30 to 50	.069	1.14 (0.99-1.30)
51 to 60	.661	1.03 (0.89-1.20)
61 to 79	.028	0.84 (0.72-0.98)
≥ 80	.140	1.15 (0.96-1.38)
Race		
Caucasian	Reference	
African American	.002	1.18 (1.06-1.31)
Hispanic	.000*	1.24 (1.11-1.40)
Asian, Pacific Islander, Native American	.024	1.19 (1.02-1.38)
Gender		
Males	Reference	
Females	.003	0.90 (0.84-0.96)
Hospital Region		
New England	Reference	
Middle Atlantic	.050	1.22 (1.00-1.50)
East North Central	.000*	1.55 (1.27-1.90)
West North Central	.000*	1.48 (1.17-1.87)
South Atlantic	.000*	1.52 (1.25-1.84)
East South Central	.000*	1.78 (1.43-2.23)
West South Central	.000*	1.46 (1.19-1.79)
Mountain	.078	1.25 (0.98-1.60)
Pacific	.150	1.16 (0.95-1.41)
Median Income		
\$1-24,999	Reference	
\$25,000-34,999	.933	1.00 (0.90-1.09)
\$35,000-44,999	.340	0.95 (0.86-1.05)
\$45,000 or more	.113	0.92 (0.82-1.02)
Admission Day		
Weekday	Reference	
Weekend	.000*	1.47 (1.35-1.59)
Insurance Status		
Private Insurance	Reference	
Medicaid	.000*	1.46 (1.30-1.63)
Medicare	.000*	1.51 (1.36-1.68)
No insurance	.000*	1.98 (1.74-2.25)
Other insurance status	.577	0.95 (0.78-1.15)

* significance level p<0.001