

COMORBIDITIES DURING THE YEAR FOLLOWING DIAGNOSIS FOR PERSONS WITH AND WITHOUT GERD USING THE AGENCY FOR HEALTHCARE RESEARCH AND QUALITY (AHRQ) 261 SPECIFIC CATEGORIES

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ABSTRACT

Objectives: Evaluate the prevalence and costs of selected comorbidities using a systematic approach.

Methods: An employer database query of >300,000 US employees from 2001-2005 to identify subjects with GERD ICD9s and a cohort without GERD (Control). For each GERD subject 10 control patients were matched using logistic regression and propensity scores from demographic differences and region. Analysis focused on the 12 months post-diagnosis (Dx). Direct medical cost data were inflated to constant dollars and assigned based on ICD9 codes from the AHRQ's 261 Specific Categories. Prevalence rates were based on persons within the cohort with claims for each category. Average costs for each category were calculated for the entire cohort. Prevalence comparisons used z-scores of log odds ratios (Woolf method), and the average cost comparisons used Satterthwaite *t*-tests.

Results: Data were available for 11,653 GERD and 116,530 matched controls. Differences between cases with GERD and controls are presented as: (% prevalence in GERD: % prevalence in controls, \$ cost in GERD: \$ cost in controls). Gastrointestinal disorders: Abdominal pain (27.3% GERD:6.8% Control, \$165 GERD:\$32 Control); Gastritis & duodenitis (15.2%:1.0%, \$87:\$5); GI hemorrhage (6.6%:1.8%, \$37:\$9); Stomach/duodenum disorders (5.4%:0.5%, \$17:\$1); Noninfectious gastroenteritis (5.0%:1.6% \$19:\$5); Biliary tract disease (3.9%:0.7%, \$150:\$25); Gastroduodenal ulcer (2.5%:0.2%, \$11:\$1); Other GI disorders (30.8%:3.6%, \$116:\$13); Respiratory disorders: Upper respiratory infections (31.5%:18.0%, \$64:\$23); Asthma (6.9%:2.8%, \$23:\$7); COPD & bronchiectasis (4.9%:2.4%, \$10:\$6); Other upper respiratory disease (21.0%:8.5%, \$79:\$24); Other lower respiratory disease (17.6%:6.8%, \$52:\$19); Other disorders: Nonspecific chest pain (18.8%:6.2%, \$163:\$46); Nutrit/endocrine/metabolic (8.6%:3.3%, \$159:\$23); Thyroid disorders (8.0%:4.8%, \$31:\$12). All costs and prevalence of comorbidities were higher in the GERD cohort compared to controls ($P<0.05$).

Conclusions: Patients with GERD have more prevalent conditions than subjects without GERD. From an insurer's perspective, this increased burden for GERD sufferers is also associated with higher costs.

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Background

- GERD is a disease that affects employees and their employers.
- A number of comorbid conditions have been identified in persons with GERD, including:
 - Asthma¹ and other respiratory diseases,²
 - Non-cardiac chest pain,³⁻⁴ and
 - Central Nervous System (CNS) Conditions such as depression and anxiety.⁵
- Comorbidity in GERD may be higher than expected for certain conditions, but comprehensive evaluations have not been undertaken to assess which GI and non-GI comorbid diseases are truly increased in GERD.
- Little is known about the cost of comorbid conditions associated with GERD in the community.

Objective

- To compare the prevalence and costs of selected comorbidities among employees with and without GERD using objectively defined disease categories.

Methods

- A retrospective analysis was performed using data from the Human Capital Management Services Research Reference Database (HCMS RRD_b) of approximately 300,000 employees using 2001-2005 adjudicated claims and demographic data from employer records.
- International Classification of Diseases, Ninth Revision (ICD9) codes listed in **Table 1** were used to identify employees with a primary, secondary, or tertiary diagnosis of GERD.

Table 1: ICD9 GERD Diagnostic Codes

Code	Diagnosis	Code	Diagnosis
251.5x	Hypersecretory condition	530.19	Other esophagitis
530.1	Esophagitis, unspecified	530.81	Esophageal reflux
530.10	Esophagitis-Incomplete	787.1x	Heartburn
530.11	Reflux esophagitis	787.2x	Dysphagia – Complete
530.12	Acute esophagitis	-----	-----

- For each GERD subject 10 control patients were matched using logistic regression and propensity scores from demographic differences and region. Control patients were required to not have any of the GERD ICD9s.

- The index date for each employee with GERD was the first date of service associated with the disease. For controls, the index date was the average index date of subjects with GERD.
- All subjects needed to be continuously employed and eligible for health benefits for at least 1 year after their index date.
- All cost data were inflated to constant 2005 United States dollars.
- All claims were assigned to the 261 specific Agency for Healthcare Research and Quality (AHRQ)⁶ categories based on the ICD9 codes on the claims, during the year following the index date.
 - Mean costs were calculated over the entire cohort.
 - Prevalence rates were based on persons within the cohort with claims for each category.
- Anonymity of person-level data was maintained according to the Health Insurance Portability and Accountability Act [HIPAA] guidelines.

Data Analysis

- Means and standard errors of demographic data were compared using t-tests for continuous variables and chi-square (χ^2) tests for discrete variables.
- Prevalence comparisons used z-scores of log odds ratios (Woolf method), and the average cost comparisons used Satterthwaite t-tests.
- Differences were considered significant when $P \leq 0.05$.

Results

- Data were available for 11,653 GERD and 116,530 matched controls (**Table 2**).

Table 2. Descriptive statistics for employees with and without GERD

Characteristic	Employees with GERD	Employees without GERD
N	11,653	116,530
Mean age at index date, years (SE)	43.2 (0.1)	43.1 (0.03) ^a
Mean tenure at index date, years (SE)	10.2 (0.1)	10.3 (0.02)
Women, %	49.0	48.7
Married, %	56.1	56.3
Race, %		
White	54.4	54.5
Black	9.9	9.8
Hispanic	9.3	9.1
Exempt employees, %	31.0	31.3
Full-time employment, %	93.7	94.0
Mean annual salary (SE), \$US ^b	52,993 (987)	52,372 (316)

^an=116,524.

^bn=11,564 and n=114,844 for employees with and without GERD, respectively. Abbreviation: SE = standard error.

FOLLOWING DIAGNOSIS FOR PERSONS AGENCY FOR HEALTHCARE RESEARCH 261 SPECIFIC CATEGORIES

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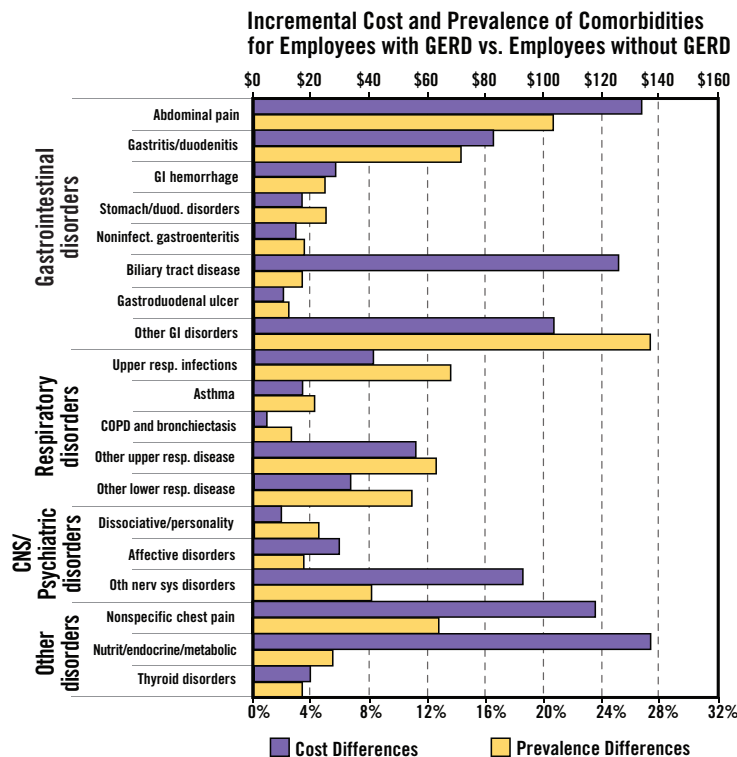
- Using the 261 AHRQ categories, the study identified:
 - 204 categories with prevalence differences (197 categories more prevalent for the GERD cohort)
 - 152 categories with cost differences (145 categories more costly for the GERD cohort)
- All prevalences and costs of comorbidities reported in **Table 3** are higher in the GERD cohort compared to controls ($P < 0.05$) with the incremental differences shown in **Figure 1**.

Table 3. Prevalence and Costs for employees with and without GERD

Category	Prevalence		Costs	
	GERD	Control	GERD	Control
<i>Gastrointestinal disorders</i>				
Abdominal pain	27.3%	6.8%	\$165	\$32
Gastritis and duodenitis	15.2%	1.0%	87	5
GI hemorrhage	6.6%	1.8%	37	9
Stomach/duodenum disorders	5.4%	0.5%	17	1
Noninfectious gastroenteritis	5.0%	1.6%	19	5
Biliary tract disease	3.8%	0.7%	150	25
Gastroduodenal ulcer	2.4%	0.2%	11	1
Other GI disorders	30.8%	3.6%	116	13
<i>Respiratory disorders</i>				
Upper respiratory infections	31.5%	18.0%	64	23
Asthma	6.9%	2.8%	23	7
COPD and bronchiectasis	4.9%	2.4%	10	6
Other upper respiratory disease	21.0%	8.5%	79	24
Other lower respiratory disease	17.6%	6.8%	52	19
<i>CNS / psychiatric disorders</i>				
Dissociative/personality	7.5%	3.1%	17	8
Affective disorders	6.4%	3.1%	49	20
Other nervous system disorders	13.9%	5.9%	135	43
<i>Other disorders</i>				
Nonspecific chest pain	18.8%	6.2%	163	46
Nutrit/endocrine/metabolic	8.6%	3.3%	159	23
Thyroid disorders	8.0%	4.8%	31	12

All costs and prevalences significantly different between cohorts ($P < 0.05$).

Figure 1. Comparison of prevalence of comorbidities for eligible employees with and without gastroesophageal reflux disease (GERD)



All cost and prevalence differences are significant ($P < 0.05$).

Conclusions

- Patients with GERD have more prevalent comorbid conditions than subjects without GERD (75% of the 261 categories).
- From an insurer's perspective, this increased burden for GERD sufferers is also associated with higher costs.
 - Patients with GERD have more costly comorbid conditions than subjects without GERD (56% of the 261 categories).
- Further research is needed to determine the relationship between GERD and the co-morbid conditions.
- This study population was composed of employed individuals: comorbidities might be different in other populations.

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