

The Likelihood of Having Functional Dyspepsia Based on Other Comorbid Conditions

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Abstract

Objectives: The etiology of functional dyspepsia (FD) is debated. However, limited published data exist on the associated co-morbid conditions with FD. This study aimed to assess the odds (likelihood) of having FD based on the presence of other objectively defined comorbid conditions.

Methods: Retrospective database analysis on a 4-year study period (2001-2004), using payroll data and adjudicated health insurance medical and prescription claims on more than 300,000 employees. Study comparisons were performed among employees with FD (ICD9= 536.8x) and propensity-score-matched employees without FD (controls, matched on age, gender, tenure with employer, marital status, race, region, salary, exempt status, and full-time/part-time). Comorbid conditions were Specific Conditions (SC) defined by the Agency for Healthcare Research and Quality (AHRQ). Subjects were classified as having the condition by any claims with an ICD-9 code for the SC. The likelihood of being in the FD cohort was modeled using logistic regression with indicator (1/0) variables for 260 of the 261 specific AHRQ SCs (the FD-SC was not included). Odds ratios >1.0 indicate the corresponding SC is more likely in the FD cohort, while ratios <1.0 indicate the SC is less likely to be in the FD cohort.

Results: The study dataset contained 85,119 employees (1669 with FD and 83,450 matched controls without FD). After controlling for all other AHRQ categories, the logistic regression found that 19 specific categories were more likely within the FD cohort, and 2 were less likely within the FD cohort. Esophageal disorders, gastritis and duodenitis, abdominal pain, and gout were most associated with having FD (odds ratios of 3.8, 3.7, 3.6, and 2.5, respectively). Only hypertension complications/secondary and disorders of teeth and jaw were significantly negatively associated with FD.

Conclusions: This study identified varied comorbidities associated with FD diagnoses and may aid FD identification in future research.

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Objectives

- Functional dyspepsia (FD) is a common, morbid condition with dyspeptic symptoms not obviously explained by an organic disease and was previously called non-ulcer or idiopathic dyspepsia.^{1,2}
- Compared with non-FD controls, FD employees annually:
 - incur costs that were \$5138 greater than non-FD controls ($P < 0.0001$),
 - had an additional 0.83 absence days per year ($P < 0.05$), and
 - produced 12% fewer units per hour than controls ($P < 0.05$).³
- The etiology of functional dyspepsia (FD) is debated.
- Limited published data exist on the associated co-morbid conditions with FD.
- This study aimed to assess the odds (likelihood) of having FD based on the presence of other objectively defined comorbid conditions.

Methods

- An analysis was performed on retrospective data (2001 to 2004) from the Human Capital Management Services (HCMS) Research Reference Database.
- The database:
 - Consists of employee records representing the retail, service, health, manufacturing, and financial industries.
 - Included payroll data and adjudicated health insurance medical and prescription claims on more than 300,000 employees.
 - Is HIPAA Compliant.
- ICD-9 codes were used to identify employees with a primary, secondary, or tertiary diagnosis of FD (536.8x). Non-FD employees were defined as the control group.
- The index date:
 - For each employee with FD, was three months before the first date of service associated with the disease.
 - For controls, was the average index date of subjects with FD.
- All subjects needed to be continuously employed and eligible for health benefits for at least 1 year after their index date.
- Using propensity-scores, 50 controls were matched to every employee with FD.
- Comorbid conditions were Specific Conditions (SC) defined by the Agency for Healthcare Research and Quality (AHRQ).⁴
- Study was performed among employees with FD (any ICD-9 code of 536.8x) and propensity-score-matched employees without FD (controls, matched on age, gender, tenure with employer, marital status, race, region, salary, exempt status, and full-time/part-time).
- Subjects were classified as having the SC if they had any medical claims with a primary, secondary, or tertiary ICD-9 code for the SC.
- The likelihood of being in the FD cohort was modeled using logistic regression with a step-wise variable selection criterion for determining which indicator (1/0) variables for 260 of the 261 specific AHRQ SCs (the FD-SC was not included) were significantly associated with FD.
- Odds ratios >1.0 indicate that people with the corresponding SC are more likely to be in the FD cohort, while ratios <1.0 indicate that people with the SC are less likely to be in the FD cohort.
- All models and statistics were generated via version 9.1 of the SAS System for Windows.
- Differences were considered statistically significant when $P \leq 0.05$.

Results

- Employees in FD cohort (N=1669) and a 50:1 matched control cohort (N=83,450) were compared and found to have similar descriptive characteristics (Table 1).
- After controlling for all other AHRQ categories, the logistic regression found (Table 2 and Figure 2):
 - 19 specific categories were more likely within the FD cohort, and 2 were less likely within the FD cohort.
 - Esophageal disorders, gastritis and duodenitis, abdominal pain, and gout were most associated with having FD (odds ratios of 3.8, 3.7, 3.6, and 2.5, respectively).
 - Only hypertension complications/secondary and disorders of teeth and jaw were significantly negatively associated with FD.

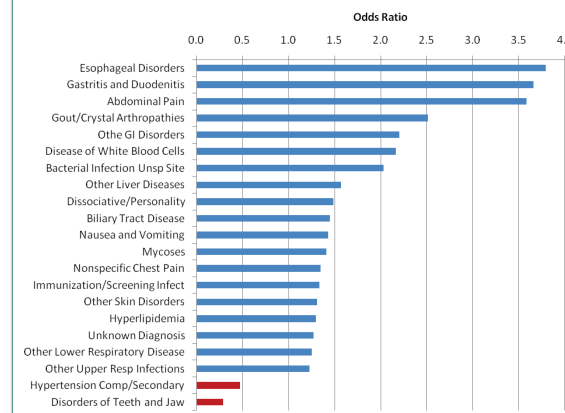
Table 1. Demographics (No Significant Differences)

Variable	Employees with Functional Dyspepsia		Employees without Functional Dyspepsia Matched Cohort ²	
	N	Mean (S.E.) or percent	N	Mean (S.E.) or percent
Age (at index date)	1,669	41.91 (0.24)	83,443	41.71 (0.03)
Tenure (at index date)	1,669	9.42 (0.20)	83,450	9.44 (0.03)
Female	1,669	54.1%	83,450	53.7%
Married	1,518	57.4%	75,904	57.4%
White	1,302	61.5%	64,819	61.9%
Black	1,302	17.1%	64,819	17.2%
Hispanic	1,302	17.0%	64,819	16.4%
Exempt	1,669	27.6%	83,450	27.9%
Full Time	1,669	93.5%	83,450	93.6%
Annual Salary	1,659	\$48,969 (\$764)	82,479	\$48,917 (\$302)

Table 2 Odds Ratio Estimates for Having Functional Dyspepsia (Significant Comorbidities)

AHRQ Comorbidity Description	Odds Ratio	95% Wald Confidence Limits	
Esophageal Disorders	3.800	3.337	4.328
Gastritis and Duodenitis	3.663	3.146	4.265
Abdominal Pain	3.589	3.174	4.057
Gout/Crystal Arthropathies	2.515	1.401	4.516
Other GI Disorders	2.209	1.932	2.526
Disease of White Blood Cells	2.169	1.339	3.514
Bacterial Infection Unspecified Site	2.036	1.350	3.071
Other Liver Disease	1.573	1.264	1.958
Dissociative/Personality Disorders	1.488	1.228	1.803
Biliary Tract Disease	1.451	1.137	1.850
Nausea and Vomiting	1.431	1.165	1.758
Mycoses	1.412	1.131	1.764
Non-specific Chest Pain	1.349	1.166	1.560
Immunization/Screening Infections	1.335	1.092	1.633
Other Skin Disorders	1.312	1.138	1.514
Hyperlipidemia	1.300	1.139	1.484
Unknown Diagnosis	1.271	1.110	1.455
Other Lower Respiratory Disease	1.252	1.077	1.455
Other Upper Respiratory Infections	1.231	1.096	1.382
Hypertension Complications/Secondary	0.476	0.312	0.726
Disorders of Teeth and Jaw	0.293	0.149	0.577

Comorbidities with Significant Odds of having or not having Functional Dyspepsia



Conclusions

- This study identified varied comorbidities associated with FD diagnoses and may aid FD identification in future research.
- Future research needs to address the relationships between the different comorbidities and FD.

References

- Talley NJ, et al. Functional gastroduodenal disorders. *Gut* 1999;45 Suppl 2:II37-42.
- Tack J, et al. Functional gastroduodenal disorders. *Gastroenterology* 2006;130:1466-79.
- Brook RA, et al. Functional Dyspepsia Impacts Absenteeism and Direct and Indirect Costs. *Clin Gastroenterol Hepatol*. 2010 Jun;8(6):498-503.
- Elixhauser A, et al. Clinical Classifications Software, 2004. U.S. Agency for Healthcare and Research. Available from <http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp> [Last accessed November 4, 2004]