Time to Diagnosis of Eosinophilic Gastritis and Eosinophilic Enteritis Improves When Patients Are Co-Managed by an Allergist and Gastroenterologist

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BACKGROUND

- Eosinophilic gastrointestinal diseases (EGIDs) are chronic inflammatory diseases characterized by persistent gastrointestinal (GI) symptoms and localized elevated eosinophils in GI mucosa[1,2]
- Eosinophilic esophagitis (EoE), eosinophilic gastritis (EG), and eosinophilic enteritis (EEn) are diagnosed by endoscopy, biopsy and quantification of eosinophils in the esophagus, stomach, and small intestine, respectively[1,2]
- Patients with EGIDs often have comorbid allergic conditions such as asthma, rhinitis or atopic dermatitis[1–3], and evidence suggests they may be ideally managed by a multidisciplinary team that includes both a gastroenterologist and an allergist[4]
- **AIM:** To characterize the real-world experience of patients on the path to diagnosis of EG and/or EEn (EG/EEn), including the involvement of these two physician specialties

METHODS

Data source and study design

- Retrospective observational study of Symphony Health's PatientSource® proprietary, longitudinal medical and pharmacy claims database (2008-18)
- Age groups defined as 0 to 10 y (children), 11 to 17 y (adolescents), and ≥18 years (y) of age (adults), based on age at initial symptom presentation
- Statistical significance tested using Wilcoxon Rank Sum test (continuous variables) or Pearson's chi-squared test (categorical variables)

Patient selection criteria

- ≥1 claim with ICD-CM diagnostic code for EG and/or EEn (K52.81)
- ≥1 claim with code for relevant GI symptom, ≥1 claim with code for endoscopy procedure & ≥1 claim for histopathology procedure prior to EG/EEn diagnosis date
- Evidence of continuous claims coverage for ≥3 years prior to and ≥1 year after 1st EG/EEn claim
- A total of 4,097 patients (62% adults, 11% adolescents, 27% children) met all study inclusion criteria; baseline characteristics are presented in Table 1

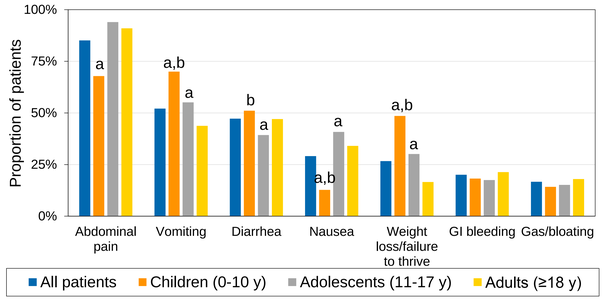
Table 1. Patient baseline characteristics

	All Patients	Children (0-10 y)	Adolescents (11-17 y)	Adults (≥18 y)
Demographics				
Number of patients	4,097	1,098	468	2,531
Age, years, mean ± SD	33 ± 24	3.6 ± 3.4	14 ± 3	49 ± 15
Female, n (%)	2,445 (60%)	403 (37%)	257 (55%)	1,785 (71%)
Insurance coverage, n (%)				
Private/commercial	3,117 (76%)	855 (78%)	376 (80%)	1,886 (75%)
Medicare	309 (8%)	2 (0%)	1 (0%)	306 (12%)
Medicaid	465 (11%)	171 (16%)	65 (15%)	229 (9%)
Self-pay/uninsured	9 (0%)	3 (0%)	1 (0%)	5 (0%)
Other/unknown	197 (5%)	67 (6%)	25 (5%)	105 (4%)
Year of presentation, n (%)				
2008 to 2011	2,621 (64%)	721 (66%)	254 (54%)	1,646 (65%)
2012 to 2015	1,210 (30%)	333 (30%)	187 (40%)	690 (27%)
2016 to 2018	266 (6%)	44 (4%)	27 (6%)	195 (8%)
Claims activity				
Years active in data set, mean ±SD	9.1 ±1.6	8.2 ±2.1	9.4 ±2.8	9.4 ±1.2

RESULTS

Patients presented with a variety of gastrointestinal symptoms

Figure 1. Frequency of GI symptoms prior to EG/EEn diagnosis



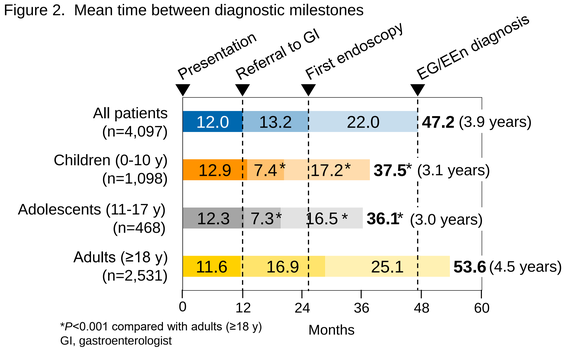
a, *P*<0.001 compared with adults; b, *P*<0.001 compared with adolescents

- Abdominal pain, vomiting and diarrhea were the most frequent GI symptoms experienced by patients prior to EG/EEn diagnosis (Figure 1)
- Symptoms were documented by a healthcare provider, at a mean (±SEM) frequency of 2.6 (±0.1) unique occurrences annually

Patients endured a lengthy path to EG/EEn diagnosis

- Median (IQR) time from presentation to diagnosis was 40.4 (17.6–67.1) months, and was significantly longer for adults (47.7, 23.3–73.5) vs adolescents (31.2, 11.4–51.5) and children (32.3, 12.2–55.4)

Figure 2. Mean time between diagnostic milestones

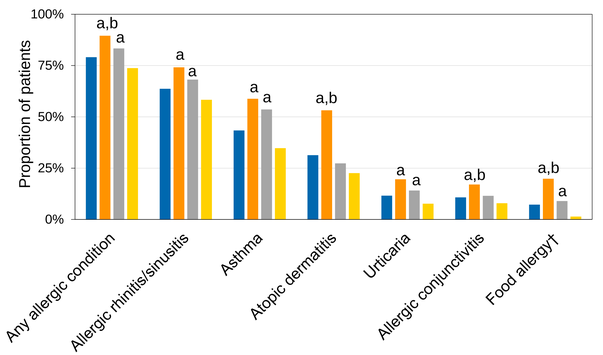


**P*<0.001 compared with adults (≥18 y)
GI, gastroenterologist

- Factors contributing to diagnostic delay across age groups include:
  - Delayed gastroenterologist referral and delayed endoscopy (Figure 2)
  - Failure to diagnose on first endoscopy: 46% of patients
  - Failure to biopsy: 7% of first endoscopies did not include biopsies; adults were less likely than adolescents and children to have biopsies taken (11% vs 3% and 2% of first endoscopies did not include biopsy, *P*<0.01)

Most EG/EEn patients had a comorbid allergic disease and/or EoE

Figure 3. Frequency of allergic comorbidities in patients with EG/EEn



a, *P*<0.001 compared with adults; b, *P*<0.001 compared with adolescents
†Only food allergies reported by allergists were considered

- Allergic comorbidities were present in 79% of patients and were significantly more common in children and adolescents vs adults (Figure 3)
- Across all age groups, most patients (90%) with a comorbid allergic condition were diagnosed with the comorbidity prior to diagnosis of EG/EEn

Most patients had an office visit with a gastroenterologist but fewer consulted an allergist prior to diagnosis of EG/EEn

Table 2. Proportion of patients with allergic comorbidity to see each specialist prior to EG/EEn diagnosis

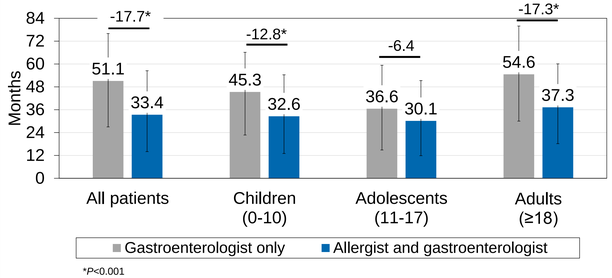
	All Patients (N=2,911)	Children (0-10 y) (N=884)	Adolescents (11-17 y) (N=353)	Adults (≥18 y) (N=1,674)
Patients with a gastroenterologist visit, n (%)	**2,760** (95%)	**812** (92%)	**340** (96%)	**1,608** (96%)
Patients with an allergist visit, n (%)	**1,125** (39%)	**605** (68%)[a,b]	**176** (50%)[a]	**344** (21%)

Office visit defined as ≥1 claim with an outpatient office visit procedure code mapped to either a gastroenterologist or allergist; a, *P*<0.001 compared with adults; b, *P*<0.001 compared with adolescents

- As expected, most patients had an office visit with a gastroenterologist prior to diagnosis of EG/EEn, with similar frequencies between age groups (Table 2)
- Fewer patients had an office visit with an allergist prior to diagnosis; adults were less likely than adolescents and children to have consulted an allergist (Table 2)

Patients who received care from both an allergist and gastroenterologist experienced a reduced time to EG/EEn diagnosis

Figure 4. Median time from initial presentation to diagnosis in patients with a history of allergic comorbidity



**P*<0.001

- Patients with a history of allergic disease who received care from an allergist and gastroenterologist experienced a significant reduction in time to EG/EEn diagnosis vs patients who received care from only a gastroenterologist; this trend was maintained across age groups (Figure 4)
- Patients under the care of an allergist prior to EG/EEn diagnosis also exhibited a significant reduction in time from initial presentation to referral to a gastroenterologist, with a mean reduction of 2.9 months (*P*<0.001)

CONCLUSIONS

- Patients with EG/EEn presented with a variety of nonspecific GI symptoms that overlap with other gastrointestinal disorders, emphasizing the need for additional clues to help increase clinical suspicion of the disease
- EG/EEn patients often endured a substantial delay across multiple steps in the diagnostic process, highlighting the need for heightened disease awareness and standardized diagnostic criteria
- Allergic comorbidities were common and in most cases diagnosed prior to EG/EEn diagnosis, yet allergists were not routinely involved in patient care; it is not possible from the available data to determine the severity of allergic disease present in each patient
- Patients with a history of allergic disease who received care from both an allergist and gastroenterologist demonstrated a significant improvement in time to EG/EEn diagnosis; further investigation into how co-management by gastroenterologists and allergists may improve the diagnostic journey and the care of patients with EG/EEn is warranted
- This analysis highlights the importance of educating healthcare providers about the association between allergic disease and EGIDs to increase clinical suspicion of EG/EEn
- Patients with allergic conditions and persistent GI symptoms such as abdominal pain, vomiting or diarrhea should be considered for referral to a gastroenterologist for an endoscopy with biopsy and quantification of eosinophils to expedite EG/EEn diagnosis

References: 1. Egan and Furuta, Ann Allergy Asthma Immunol. 2018 Aug;121(2):162-167; **2.** Gonsalves, Clin Rev Allergy Immunol. 2019 Oct;57(2):272-285; **3.** Pesek et al., Am J Gastroenterol. 2019 Jun;114(6):984-994; **4.** Dellon and Liacouras, Gastroenterology. 2014 Dec;147(6):1238-54

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