Avoidant Restrictive Food Intake Disorder in Adults With Eosinophilic Esophagitis

Eosinophilic esophagitis (EoE) is a chronic immune-mediated disease that has been associated with psychiatric comorbidities in all ages, increased risk of anxiety and depression, and concerns for feeding dysfunction. Avoidant restrictive food intake disorder (ARFID) was defined in the diagnostic and statistical manual V in 2013. ARFID is an eating disorder causing failure to meet nutritional or energy needs with minor criteria of weight loss, nutritional deficiency, enteral feeds or supplements, and impaired psychosocial functioning. For diagnosis, the eating disturbance must not be explained by lack of available food or another disorder, such as anorexia nervosa or bulimia nervosa, and when ARFID occurs with another disorder, the severity of symptoms must be out of proportion to that other disorder. The limited literature to date on ARFID and EoE has been in children. The aim of this study was to determine clinical features, psychiatric comorbidities, and burden of disease for adult patients with EoE and with suspected ARFID.

We conducted a retrospective cohort study at University of North Carolina from 2018 to 2020 assessing patients with EoE and restrictive eating behaviors, approved by the University of North Carolina institutional review board. Data were extracted from electronic medical records. EoE diagnosis was as per consensus guidelines. ARFID diagnostic criteria and symptomatic improvement were evaluated clinically based on history, physician assessments, and laboratory evaluation. Nutritional deficiency was considered present if laboratory values confirmed a deficiency, there was a documented diagnosis, or there was a need for supplementation. Psychosocial dysfunction was defined as having interference of social, family, or career aspects of life or a preexisting/comorbid psychiatric diagnosis. In addition, endoscopic findings (EoE endoscopic reference score) and histologic information were collected. Post-treatment histological response was defined as <15 eos/hpf, and patient-reported global improvement in symptoms was defined dichotomously (yes/no).

Of 266 incident EoE cases identified during the study period, 12 adults (4.5%) had restrictive eating patterns and symptoms out of proportion to disease activity (mean age 33.8 ± 12.1; 75% male; 67% white) (Table). Atopy was present in 58%. Baseline symptoms included dysphagia in all patients, with eating difficulty/refusal (83%), weight loss (75%), and food intolerance (50%) also common; 5 (42%) had antecedent food impaction. Over the mean follow-up time of 18.8 ± 18.3 months, there were an average of 2.6 ± 2.5 health care contacts per month and a mean number of endoscopies of 4.3 ± 3.2.

All patients with restrictive eating patterns met diagnostic and statistical manual V criteria for ARFID diagnosis. Each failed to meet energy needs, suggested by inability to maintain appropriate nutritional intake or necessity of supplements. Regarding the minor criteria, 75% had weight loss, 50% had nutritional deficiency, 50% required enteral feeding/supplements, and 75% had psychosocial dysfunction. Comorbid psychiatric diagnoses occurred in 83% of the cohort, with anxiety (58%) and depression (42%) the most frequent. Two-thirds were on centrally acting medications in total, with 88% of those started during ARFID course.

All patients had prior EoE therapies (92% proton pump inhibitors; 100% diet modification; 100% budesonide/fluticasone; 92% dilation) (Table). During our baseline evaluation, esophageal strictures were nearly universal, with 92% requiring dilation. The average stricture size was 12.4 mm before treatment and 15.6 mm at the last follow-up. The average baseline EoE endoscopic reference score was 4.33 ± 1.8, and the peak eosinophil count was 56 ± 29.8 eos/hpf. EoE symptomatic and histologic response occurred in 58% and 42%, respectively. Of patients with ARFID treated with psychiatric medications, 71% reported improvement with an average weight increase of 2.4 ± 3.0 kg.

In this study, we explored clinical and psychiatric features of 12 adult patients with EoE meeting criteria for ARFID. To our knowledge, this is the first study investigating ARFID in an adult EoE population. Previously, Robson et al evaluated a pediatric EoE population with ARFID and attributed development of abnormal eating patterns to elimination diets used for EoE treatment. It has been suggested that ARFID develops from 3 main presentations: sensory sensitivity, lack of interest or low appetite, and fear due to previous traumatic events. The association between ARFID and other gastrointestinal disease remains an emerging field, but a recent study characterizing the types of gastrointestinal disorders in patients with ARFID found reflux and irritable bowel syndrome to be the most common, with EoE comprising a much smaller percentage. Our study found that ARFID characteristics are not limited to a particular age group, and presentations are multifactorial, complicated by strictures and psychiatric comorbidities. This appears...
consistent with data in children and adolescents, where psychiatric comorbidities appear to be common with a range of 45%–95%.9 It is possible that prior food impactions or severe dysphagia symptoms were traumatic events that initiated ARFID behavior, but we cannot determine from our data if psychosocial dysfunction predated the ARFID diagnosis or was a consequence. Although optimal ARFID treatment

**Table.** Demographic, ARFID History, Treatment History, Endoscopic, and Histologic Data of Patients With EoE (n = 12)

| Demographics, n (%) |   |
|---------------------|---|
| Age (mean years ± SD) | 33.8 ± 12.1 |
| Male | 9 (75) |
| White | 8 (67) |
| Atopic diagnosis | 7 (58) |
| Length of follow-up (mean months ± SD) | 18.8 ± 18.3 |
| Contacts per month*(mean ± SD) | 2.6 ± 2.5 |
| Endoscopies (mean ± SD) | 4.3 ± 3.2 |

| Baseline symptoms, n (%) |   |
|--------------------------|---|
| Dysphagia | 12 (100) |
| Food impaction | 5 (42) |
| Heartburn | 3 (25) |
| Chest pain | 3 (25) |
| Abdominal pain | 5 (42) |
| Weight loss | 9 (75) |
| Food intolerance | 6 (50) |
| Eating difficulty/refusal | 10 (83) |
| Visceral food sensitivity | 5 (42) |

| ARFID criteria, n (%) |   |
|-----------------------|---|
| Major criteria | 12 (100) |
| Failure to meet energy needs | 9 (75) |
| Minor criteria | 6 (50) |
| Weight loss | 6 (50) |
| Nutritional deficiency | 9 (75) |
| Enteral feeding/supplements | 9 (75) |
| Interference on psychosocial functioning | 9 (75) |
| Total patients meeting criteria | 12 (100) |

| Psychiatric diagnoses, n (%) |   |
|-----------------------------|---|
| Any diagnosis | 10 (83) |
| Depression | 5 (42) |
| Bipolar disorder | 1 (8) |
| Anxiety | 7 (58) |
| Anorexia | 1 (8) |

| Psychiatric treatments, n (%) |   |
|------------------------------|---|
| Any medication | 8 (67) |
| SSRIb | 4 (33) |
| Buspirone | 1 (8) |
| Antipsychotic | 1 (8) |
| Other medication | 3 (25) |
| SNRIc | 3 (25) |
| Benzodiazepine | 6 (50) |
| Counseling | 1 (8) |

| EoE treatment historyd, n (%) |   |
|------------------------------|---|
| Diet modification | 12 (100) |
| Budesonide or fluticasone | 12 (100) |
| PPIe | 11 (92) |
| Dilation | 11 (92) |

| Baseline endoscopic findings, n (%) (n = 12) |   |
|---------------------------------------------|---|
| Rings | 9 (75) |
| White plaques | 8 (67) |
| Furrows | 9 (75) |
| Edema | 8 (67) |
| Crêpe-paper mucosa | 2 (17) |
| Narrowing | 4 (33) |
| Stricture | 10 (83) |
| Initial stricture size (mean mm) | 12.4 |
| Dilatation performed | 11 (92) |
| EREFS total (mean ± SD) | 4.33 ± 1.8 |

| Histologic findings |   |
|---------------------|---|
| Max eosinophils (mean ± SD) | 56 ± 29.8 |
| EoE histologic remission, n (%) | 5 (42) |

| Symptomatic responses, n (%) |   |
|-----------------------------|---|
| Ever EoE symptom response | 7 (58) |
| ARFID symptom improvement | 8 (67) |

| Average weight change (kg ± SD) |   |
|-------------------------------|---|
| ARFID symptom improvement | 2.4 ± 3.0 kg |
| No ARFID symptom improvement | 1.5 ± 2.4 kg |

| EREFS, EoE endoscopic reference; SD, standard deviation. |   |
|-----------------------------------------------|---|
| *Contacts include clinic visits, phone calls, endoscopies, etc. |   |
| **SSRI:** selective serotonin reuptake inhibitor. |   |
| **SNRI:** serotonin norepinephrine reuptake inhibitor. |   |
| **Therapies used at any point during EoE care. |   |
| **PPI:** proton pump inhibitor. |   |

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remains under investigation, previous case series suggest benefit with a combination of family therapy, cognitive behavioral therapy, and psychiatric medications, which is consistent with our data in adults.\textsuperscript{10}

Limitations of our study include the retrospective nature and small sample size. It is acknowledged that a large proportion of this population underwent dilation, although the role of dilation in ARFID is unclear and will need to be addressed in future studies. Furthermore, prospective studies will need to be conducted to determine the true prevalence of ARFID in EoE. For example, the prevalence could be higher (patients may not have had ARFID symptoms documented and were not included in this study) or lower (our database only reflects incident cases, so prevalent cases would increase the denominator). However, it is probable that ARFID is an under-recognized diagnosis in this patient population.

In conclusion, we report the first series of adults with EoE and ARFID. Although disease activity could be controlled, severe strictures and high burden of psychiatric comorbidities complicated treatment. Providers should assess eating patterns, be aware of possible restrictive behaviors, and evaluate for ARFID in patients with EoE, regardless of their age, with a multidisciplinary approach to treatment.

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