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Evaluation and Treatment of Avoidant/Restrictive Food Intake Disorder (ARFID) in Adolescents

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Abstract

Purpose of review: Avoidant/restrictive food intake disorder (ARFID) was added to the psychiatric nomenclature in 2013. However, youth with ARFID often present first to medical—rather than psychiatric—settings, making its evaluation and treatment relevant to pediatricians.

Recent findings: ARFID is defined by limited volume or variety of food intake motivated by sensory sensitivity, fear of aversive consequences, or lack of interest in food or eating, and associated with medical, nutritional, and/or psychosocial impairment. It appears to be as common as anorexia nervosa and bulimia nervosa and can occur in individuals of all ages. ARFID is heterogeneous in presentation and may require both medical and psychological management.

Summary: Pediatricians should be aware of the diagnostic criteria for ARFID and the possibility that these patients may require medical intervention and referral for psychological treatment. The neurobiology underlying ARFID is unknown, and novel treatments are currently being tested.

Keywords

Avoidant/restrictive food intake disorder; ARFID; eating disorder; nutrition deficiencies; cognitive-behavioral therapy; CBT-AR

Introduction

The *Diagnostic and Statistical Manual of Mental Disorders 5th Edition (DSM-5)* introduced avoidant/restrictive food intake disorder (ARFID)(1) as a reformulation of DSM-IV feeding disorder of infancy and early childhood (2). According to *DSM-5* criteria, to be diagnosed with ARFID, an individual must have problematic eating habits, which may be due to an inability to tolerate certain sensory properties of food (e.g., texture, taste, appearance); a fear

of potential adverse consequences of eating (e.g., choking, vomiting); and/or an overall lack of interest in food or eating. These alterations must be significant enough to cause either weight loss or failure to gain appropriate weight in growing children; nutritional deficiencies; dependence on nutritional supplements (e.g., energy-dense drinks or tube-feeding); or psychosocial dysfunction. However, these behaviors cannot be due to food insecurity or culturally accepted practices; are not motivated by fear of weight gain or weight/shape overvaluation as in anorexia nervosa (AN) or bulimia nervosa (BN); and are not better explained by another medical or psychological disorder. If there is another medical or psychiatric disorder present, food avoidance or restriction must be more extreme than what would typically be expected for the co-occurring condition. ARFID can be diagnosed in individuals of all ages. This new diagnosis provides a framework to categorize, evaluate, and treat individuals who are nutritionally deficient but did not meet criteria for previously defined eating or feeding disorders.

What is known about ARFID?

Clinical presentation.

ARFID is a heterogeneous psychiatric disorder in which individuals present with *avoidance* of certain foods or categories of food resulting in a diet that is limited in variety, and/or *restriction* of overall intake resulting in a diet that is limited in volume. One of the most common rationales for avoidance and restriction in ARFID is a heightened sensitivity to the sensory properties of food (e.g., taste, texture, appearance, smell). Individuals with sensory sensitivity may experience vegetables or fruits as intensely bitter, for example, and therefore avoid these foods and be fearful of or disgusted by the prospect of trying novel foods. In turn, these individuals frequently rely on highly processed energy-dense foods and may have significant deficiencies in vitamins and minerals. For individuals with sensory sensitivity, food avoidance is often longstanding, having developed in early childhood.

Individuals with ARFID may also exhibit food avoidance or restriction due to a fear of aversive consequences, such as a fear of choking, vomiting, or gastrointestinal pain. Often these individuals have experienced a food-related trauma and subsequently begin avoiding the index food to guard against another negative experience. While the avoidance reduces anxiety momentarily, it reinforces anxiety over time by preventing the opportunity for new corrective learning to occur. In our clinical experience, these individuals often have an anxious predisposition and their food avoidance generalizes beyond the index food to similar foods, then to entire food groups, and in some of the most severe cases, to avoidance of all solid foods. When fear of aversive consequences is primary, the onset is often acute.

A lack of interest in food or eating is also common in individuals with ARFID and can be maintained by a diet that is limited in volume. Individuals with lack of interest describe eating as a chore and present with low homeostatic and hedonic appetites. Due to their low-volume intake, they often present to treatment with low weight or a failure to thrive, and their lack of interest is often longstanding.

In ARFID, an individual can present with one, two, or even three of these rationales for food avoidance or restriction, resulting in a heterogeneous diagnostic category. Rather than

existing as diagnostic subtypes, our clinical impression is that these rationales for restriction represent dimensions on which any given patient can be high or low (3).

Epidemiology.

In pediatric, adolescent medicine, and eating disorder clinics, preliminary studies suggest that, compared to patients with AN or BN, cohorts of patients with ARFID tend to be younger (4,5), include a greater proportion of males (4,6), experience a longer duration of illness before treatment presentation (4), and are more likely to be diagnosed with a co-occurring medical condition (5). One retrospective case control study showed that patients with ARFID were more likely to have an anxiety disorder but less likely to have a mood disorder than patients with AN or BN (4). Since ARFID is a relatively new diagnosis, there have only been two population-based prevalence studies. An Australian interview-based study of males and females ages 15 and older reported a 3-month point prevalence of ARFID of 0.3% in 2013 and in 2014 (7). A study of schoolchildren ages 8–13 in Switzerland reported a point prevalence of 3.2% measured via self-report questionnaire (8). These emerging data suggest that ARFID may be as common as AN and BN. Further, studies from North America have shown that 5–12% of patients presenting for eating disorder care at outpatient clinics (9–11) and 22.5–24.6% of patients presenting to an outpatient day program for younger adolescents with eating disorders (12,13) meet *DSM-5* criteria for ARFID.

Contributing factors.

Because ARFID is so new, its etiology is unknown. Similar to other eating and feeding disorders, it is probable that both biological and environmental factors—and their interplay—contribute to pathogenesis. We hypothesize that there may be biological bases that underlie sensory sensitivity, trait anxiety, and both homeostatic and hedonic appetites, which may increase vulnerability to ARFID (3). Environmental factors such as family meal milieu, availability of fruits and vegetables in the local environment, and exposure to models of healthy eating and/or diverse foods may also play a role.

Evaluation

Medical evaluation.

In the initial medical evaluation, the pediatrician should obtain a careful history of the patient's eating habits. Patients with ARFID can have a variety of altered eating habits, which can include apathy, dislike, or fear of specific foods, or of eating in general. Some patients may present with a lifelong history of picky eating and avoidance of particular textures, colors, tastes, or smells and unwillingness to eat new foods; others may have had a more recent change in eating habits secondary to gastrointestinal discomfort or an acute episode of choking or vomiting experienced as traumatic (4,5). It is crucial to query the patient's attitudes towards weight and body image, in order to rule out AN, BN, or a related eating disorder.

Patients may report symptoms attributable to acute malnutrition, including fatigue, dizziness, and syncope and/or more long-standing malnutrition, such as abdominal pain,

constipation, cold intolerance, amenorrhea, dry skin, and hair loss (14). On exam, signs of malnutrition can include cachexia, hypothermia, bradycardia, orthostatic tachycardia and hypotension, scaphoid abdomen, lanugo, and pallor (14). The wide variety of presentations of ARFID can lead to a wide variety of sequelae, from specific micronutrient deficiencies (see Table 1) to more global malnutrition, weight loss, and/or failure to appropriately gain weight and height as the patient progresses through childhood and adolescence. Pre-menarchal females may experience primary amenorrhea while post-menarchal females may experience secondary amenorrhea due to weight loss and chronic malnutrition. It is important to consider other etiologies of these presenting signs and symptoms, including malignancies, chronic gastrointestinal disorders (e.g. celiac disease, inflammatory bowel disease), endocrine disorders (e.g. hyperthyroidism, Addison's disease, type 1 diabetes), infectious diseases (e.g. tuberculosis or human immunodeficiency virus), or conditions that hinder chewing or swallowing of boluses of food (e.g. tonsillar hypertrophy, oromotor dysfunction, achalasia) (15).

Most patients should have screening blood work including complete metabolic panel, magnesium, phosphorus, complete blood count with differential, thyroid stimulating hormone, erythrocyte sedimentation rate, and c-reactive protein, as well as a urinalysis. It is worth considering screening for celiac disease with a total immunoglobulin A (IgA) and tissue transglutaminase IgA, as there is a high rate of co-occurrence of celiac disease and AN (16). Patients with bradycardia or hemodynamic instability should have an electrocardiogram. A human chorionic gonadotropin (HCG) should be checked in post-menarchal females who present with amenorrhea; bone density can be assessed using dual-energy X-ray absorptiometry (DXA) in patients who have menstruated fewer than 6 times in the past year (17). While blood tests are useful for determining micronutrient deficiencies, diet history as well as family reports of intake are often just as or more important to identify potential deficiencies (18).

Part of the initial evaluation should include determination of a target weight for patients who are underweight. Target weight and body mass index (BMI) is typically determined for patients with restrictive eating disorders by looking at the patient's BMI growth charts and trying to return the patient to his or her pre-illness trajectory (19). Target weights can be more difficult to determine in patients presenting with lifelong malnutrition due to ARFID, as these patients may have been chronically underweight. In these situations, the pediatrician should set a target weight that is high enough to enable the patient to progress through puberty appropriately and gain the height at the expected rate for age, sex, and genetic potential; this is assessed by looking closely at the patient's growth charts throughout treatment. For those under the age of 20, the goal weight will increase with time, given increases in height and expected increases in BMI. Often, the physician will need to make the case for the importance of frank weight gain in ARFID, rather than weight restoration (as in other eating disorders such as AN), with the patient and parents.

Psychological evaluation.

A clinical interview with a mental health clinician is critical to confer diagnosis. Ideally, the psychological evaluation would include both the patient and his or her caregivers (e.g.,

parents). Clinical assessment comprises review of ARFID diagnostic criteria, recall of a typical day of eating, assessment of foods regularly accepted across the five basic food groups (fruits, vegetables, protein, dairy, and grains) vs. those that are avoided, determination of the impact of the patient's eating on health or psychosocial functioning, and evaluation of the degree of caregiver accommodation currently in place. As the diagnosis is new, formal diagnostic assessment tools are still under development. The Pica ARFID and Rumination Disorder Interview (PARDI) (20) is a comprehensive structured clinical interview designed to confer diagnosis and to measure global severity and severity across rationales for restriction. In addition, patient responses to brief self-report screening tools, such as the Eating Disorders in Youth Questionnaire (EDY-Q) (21) or the Nine-Item ARFID Screen (NIAS) (22), may provide clues to appropriate follow-up questions at the clinical interview.

Ascertaining the ARFID diagnosis requires differential diagnosis from the other eating and feeding disorders, as well as from other psychiatric diagnoses. While ARFID is characterized by restricted intake, which can overlap with AN, in ARFID the restriction is not due to fear of fatness or efforts to control weight or body shape. ARFID is also differentiated from garden variety picky eating, which often develops in preschoolers but ultimately remits without treatment. By contrast, ARFID is more persistent, severe, and associated with medical and psychosocial sequelae. Rather than improving with age, the selective eating associated with ARFID typically escalates, becoming more entrenched during childhood and adolescence if left untreated.

Psychiatric comorbidities including anxiety and mood disorders, obsessive-compulsive disorder, autism spectrum disorder, and attention deficit hyperactivity disorder are commonly seen in individuals with ARFID. When food avoidance or restriction is primary and associated with significant medical, nutritional, and/or psychosocial compromise it generally requires clinical attention outside of what would be warranted in treating these comorbid conditions alone, which can guide in determining the threshold for an ARFID diagnosis when comorbidity is present.

Treatment

Medical.

Treatment can range from an outpatient multidisciplinary team treatment to inpatient medical hospitalization (14). Because ARFID is such a new diagnosis, there is little evidence supporting treatment strategies and consensus guidelines have not yet been developed (5). Depending on the needs of the patient, an outpatient medical team should comprise, at minimum, a medical provider and mental health clinician, and potentially other specialty providers as needed, such as a dietitian, pediatric gastroenterologist, occupational therapist, and/or speech pathologist. Until there is further evidence to guide practitioners, it seems reasonable that treatment goals for ARFID be similar to goals for other restrictive eating disorders, including weight restoration and resumption of menses in amenorrhoeic females (19).

Some patients with ARFID can become medically compromised and require medical hospitalization for monitoring and nutritional rehabilitation. The Society for Adolescent Health and Medicine has published guidelines for when an individual with a restrictive eating disorder should be medically hospitalized (19). In our experience, many patients with ARFID have been underweight for such an extended period that they have developed a level of homeostasis so they do not present with the same degree of bradycardia and hypotension as is seen in patients with AN who are actively losing weight. In such cases, the physician can use the patient's weight as a guide to determine the need for hospitalization: A medical admission may still be necessary if the patient's current BMI is less than 75% of the median BMI for sex and age. If a patient with ARFID is medically hospitalized, he or she may benefit from being placed on a structured refeeding protocol to promote weight gain and monitor for the electrolyte shifts that can be a harbinger of refeeding syndrome. However, given that patients with ARFID may have difficulty with both variety and volume, it may be necessary to rely on preferred foods to facilitate the initial increase in volume that will be necessary to support weight gain. One retrospective chart review of patients medically hospitalized showed that patients with ARFID experienced electrolyte shifts similar to patients with AN; compared to patients with AN, patients with ARFID had a longer length of stay, thought to be due to increased reliance on enteral feeding and lower starting calorie goals early in the admission (23).

Some of these patients require oral nutritional supplements, nasogastric tube feedings, or gastrostomy tube feedings to maintain adequate nutrition (1). One study of patients medically hospitalized for eating disorders showed that patients with ARFID are more likely to rely on enteral nutrition than patients with AN (23). The patient's current intake, motivation for treatment, and diet limitations should be considered when deciding whether to use supplements or food alone. In our experience, patients with ARFID are more likely than those with other eating disorders (e.g., AN) to present for initial evaluation relying on long-term enteral feedings in an ambulatory setting, whereas patients with other eating disorders generally receive short-term enteral feedings in the inpatient setting. We hypothesize that the greater reliance on tube feeding in the ARFID group is due to many of these patients presenting to medical providers (e.g., pediatric gastroenterologists) rather than mental health clinicians, prior to the advent of ARFID as a psychiatric diagnosis. Tube feeding can be a life-saving treatment strategy in the setting of acute malnutrition, but, in most cases, should be considered a temporary measure to support the ultimate treatment goal of obtaining adequate nutrition through oral intake. Once patients have gained to a healthy weight and can take in at least some nutrition by mouth, weaning off tube feeds is typically done under close supervision in an inpatient (24) or day treatment (25) setting.

For patients who are not medically compromised, the physician should consider whether outpatient psychotherapy is sufficient or whether referral to day treatment or intensive outpatient treatment eating disorder program is warranted. For example, day treatment can serve as a valuable source of structure and support to both improve weight and increase variety in eating habits. It is worth considering a higher level of care with an eating disorder program in patients who either have been unable to make progress with an outpatient team or are losing weight and may end up medically hospitalized if changes are not made relatively rapidly. In some patients, it can be difficult to ascertain in a single evaluation

whether the patient has ARFID or AN, and the close observation of an eating disorder program can provide diagnostic clarification. One study demonstrated that patients with ARFID could be successfully treated at eating disorder day treatment programs, demonstrating weight gain, decreased food restriction, and decreased anxiety symptoms (13).

There are limited studies that look at the prevalence of nutritional deficiencies in eating disorders and specifically in ARFID. The types and severity of deficiencies this population can vary greatly. Since decreased intake and elimination or avoidance of food groups often occur over an extended period of time, conservation and adaptation mechanisms of metabolism can result in laboratory values appearing normal despite prolonged inadequate intake (18). Supplementation or repletion of specific vitamins and minerals should be considered if labs or symptoms are clinically significant or if diet remains limited. A prompt repletion is required to avoid the negative effects that deficiencies of B12, zinc, iron, vitamin C and folate may have on appetite, taste, mood and energy levels, which may in turn affect a patient's ability to fully participate in treatment. Most nutrients require initial high doses that would be difficult to achieve with food alone and may require prolonged courses of supplementation to reverse the deficiency effectively. Patients should be encouraged to include foods high in the deficient nutrients regardless of supplementation because continued intake of these nutrients is necessary to maintain repletion and health.

Some low-weight individuals with the lack of interest presentation of ARFID may benefit from off-label use of cyproheptadine, a medication with antihistaminergic and antiserotonergic properties; a study in children ages 7 months to 6 years with a variety of feeding difficulties showed that patients receiving cyproheptadine had greater improvements in weight gain and positive changes in mealtime and feeding behaviors as compared to those not taking cyproheptadine (26). In our experience, some but not all patients benefit from cyproheptadine promoting increased appetite and gastric accommodation. It is important to be aware that patients can develop tachyphylaxis to cyproheptadine, so if the efficacy wanes with time, it may be worth having the patient take a one week medication holiday on a monthly basis.

Psychological treatment.

Psychological treatments for ARFID are emerging. At Massachusetts General Hospital, our Eating Disorders Clinical and Research Program team has developed a cognitive-behavioral therapy for ARFID (CBT-AR) to treat individuals ages 10 and older with all presentations of ARFID who are medically stable and not reliant on enteral feeding (27). This structured time-limited outpatient intervention can be delivered in an individual or family-supported format depending on the patient's age, and lasts between 20 to 30 sessions depending on the degree of nutritional compromise. The treatment operates using the principle of *volume before variety* to support nutritional rehabilitation (i.e., weight restoration, correction of deficiencies). Specifically, patients who are underweight are encouraged to eat larger volumes of preferred food in the early stages of treatment, before increasing dietary variety in later stages. The key intervention is structured in-session exposure to systematically address the maintaining mechanisms most relevant for the patient, including sensory

sensitivity, fear of aversive consequences, and lack of interest in food and eating. CBT-AR is currently being tested in an open trial at Massachusetts General Hospital, so efficacy data are not yet available. However, preliminary results are promising in terms of weight gain, resolution of nutrition deficiencies, and modest expansion of dietary variety, as illustrated in a published case report utilizing the approach (15).

Psychiatric medications.

There is currently no psychotropic medication for treatment of ARFID approved by the U.S. Food and Drug Administration. However, case reports and small case series have described the use of mirtazapine (15) or lorazepam (28) to decrease anxiety related to eating; and olanzapine (29) to reduce cognitive rigidity in beliefs about food and to promote weight gain. Future randomized placebo-controlled trials are needed to evaluate the efficacy of these medications for the resolution of ARFID symptoms.

Conclusions

ARFID is a relatively new psychiatric diagnosis, which captures a clinically significant and prevalent restrictive eating problem that occurs in individuals of all ages and across genders. Emerging data suggest that ARFID is as common as the classical eating disorders and can be associated with important medical and psychological consequences. Moreover, data from pediatric and adolescent medicine clinics nationwide highlight the prevalence of this problem in medical settings, underscoring the need for pediatricians to be familiar with the evaluation and clinical management of this diagnosis.

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Table 1:

Signs and symptoms of specific vitamin and mineral deficiencies due to dietary restrictions.

Foods avoided	Potential vitamin & mineral deficiencies	Potential signs & symptoms
Meat and animal products	Vitamin B12	Megaloblastic or Macrocytic anemia, low energy, weakness, numbness or tingling in hands or feet, trouble walking or unsteadiness, constipation, anorexia, confusion and poor memory, mood changes, psychosis, mouth/tongue discomfort
	Zinc	Poor growth and development, anorexia, weakened immune system, impaired night vision, taste and smell changes, hair loss, diarrhea, poor wound healing
	Iron	Microcytic anemia, pallor, weakness, fatigue or sleepiness, irritability, poor concentration, learning and cognitive difficulties, mood changes, decreased exercise endurance, headaches, temperature intolerance, weakened immune system
Animal products and/or dairy	Riboflavin/ Vitamin B2	Low energy, poor growth, dry skin /skin problems, hair loss, dry cracked lips or cracks at the corners of mouth, swollen magenta-colored tongue, itchy and/ or red eyes, sore throat, anemia and cataracts
Dairy	Calcium	A deficiency is rarely detected by lab values. The body closely regulates serum levels despite intake. Food history is the best way to assess for a deficiency. Prolonged inadequate intake can result in decreased bone mineral density, osteopenia, weak or broken bones and osteoporosis.
	Vitamin D	Low bone mineral density, hypocalcemia, accelerated bone loss, bone pain, osteomalacia, rickets
Fruits and vegetables	Vitamin C	Petechiae and easy bruising, bleeding and swollen gums, anorexia, anemia, feeling unwell, muscle and joint pain, corkscrew hair, perifollicular hemorrhage, impaired wound healing, hyperkeratosis, weakness, mood disturbances
Fruits, vegetables and/ or overall low quality diet	Folate	Megaloblastic or Macrocytic anemia, persistent fatigue, pallor, palpitations, shortness of breath, headaches, oral ulcerations, increased risk of birth defects, poor concentration, increased irritability, weight loss
Very low fat or protein diet	Vitamin A	Poor night vision/ night blindness, weakened immune system, follicular hyperkeratosis, impaired wound healing
	Vitamin K	Bruising and easy bleeding, increased prothrombin time
	Protein	Loss of lean body mass, decreased energy
	Fat	Weight loss, amenorrhea

Sources: (30–40)