

FURTHER READING

NUTRITIONAL DEFICIENCIES SECONDARY TO ARFID IN AUTISM

Summer Yule, MS, RDN www.SummerYule.com Summer@SummerYule.com

Lucarelli J, Pappas D, Welchons L, Augustyn M. Autism spectrum disorder and avoidant/restrictive food intake disorder. *J Dev Behav Pediatr.* 2016.

This is a case report of a 4-year-old girl with autism, who had a self-imposed diet of french fries, crackers, pretzels, and 32 oz. soy formula. Her care team wanted to replace the formula with water, but they should have suggested that the parents find a multivitamin or a supplement shake that their child will accept *first*, before trying to replace the formula. Barring that, I would recommend tapering down on one of the white flour foods that are not providing as many micronutrients, instead of the formula. When her dietary variety increased, it would be safe to reduce the formula. If an RD had been part of her treatment team, her family could have learned that she is not in immediate nutritional risk (since the soy formula is providing the essential nutrients) and they have time to explore options.

Christensen SS, Bentz M, Clemmensen L, Strandberg-Larsen K, Olsen EM. Disordered eating behaviours and autistic traits—Are there any associations in nonclinical populations? A systematic review. *Eur Eat Disorders Rev.* 2018;1-16.

This systematic review found a significant positive association between Autism Quotient (AQ) scores and problematic eating behaviors, for both children and adults. It is important to note the review excluded studies of individuals who had been diagnosed with autism; they only looked at non-clinical populations with “autistic-like” traits. Those with these traits were more prone to restrictive eating and to bulimia-like eating, but not to anorexia-like eating, which the authors speculate may be related to lack of statistical power. Since this was a review of cross-sectional studies, this review cannot answer questions of directionality, i.e. are autistic-like behaviors traits which represent an endophenotype of eating disorders, or are they a result of the irregular eating patterns and nutrient deficiencies due to the disorder itself?

Shmaya Y, Eilat-Adar S, Leitner Y, Reif S, Gabis LV. Meal time behavior difficulties but not nutritional deficiencies correlate with sensory processing in children with autism spectrum disorder. *Res Dev Disabil.* 2017;66:27-33.

This case control, multi-center study explored the feeding difficulties of 3-6-year-old children with ASD (n=50) to two control groups: their siblings (in the same household), as well as a gender- and age-matched control group. This study found that mealtime behavior difficulties were more prevalent in the ASD group, and the difficulties were associated with sensory sensitivities, but not necessarily nutrient deficiencies. The implications of this paper are that sensory aversions are not necessarily the factor that is putting many children at nutritional risk, and also (since typically-developing siblings were studied) that higher food aversions in the autism group were not being caused by household factors.

Planerova A, Philip S, Elad S. Gingival bleeding in a patient with autism spectrum disorder: A key finding leading to a diagnosis of scurvy. *Quintessence Int.* 2017;48(5):407-411.

The primary reason that most of the case reports included in this systematic review were published was to assist medical professionals in differentially diagnosing severe vitamin C deficiency (scurvy) from other medical conditions. This article mentions some of the conditions that can mimic the features of scurvy. They include: infectious diseases, drug-induced gingival enlargement, malignancy, and other connective tissue/bone diseases (such as gingival fibromatosis).

Duggan CP, Westra SJ, Rosenberg AE. Case 23-2007: A 9-year-old boy with bone pain, rash, and gingival hypertrophy. *New Engl J Med.* 2007;357(4):392-400+330.



The photo to the left is from the case report of a 9-year-old boy with autism who had developed scurvy due to a self-imposed restrictive diet of toaster pastries and cola drinks. He refused fruits and vegetables. The photo shows a very common symptom of scurvy, perifollicular hyperkeratotic papules with surrounding hemorrhage. This was on his legs, but it can appear on other parts of the body. His older sister and parents were healthy.

Williams KE, Hendy HM, Field DG, Belousov Y, Riegel K, Harclerode W. Implications of avoidant/restrictive food intake disorder (ARFID) on children with feeding problems. *Child Health Care.* 2015;44(4):307-321.

This article may provide an explanation as to why parents may continue to offer the preferred foods to a child with ARFID, to the detriment of the child's health. Children with unidentified ARFID and failure to thrive (FTT) have been separated from their families by child protective services. Williams et al. (2015) discusses three cases of foster placement for "neglect" of children who had unidentified ARFID along with FTT, and none of these children improved eating habits with a change of caregivers. Two of the three children that were placed had a developmental delay, while the third had a chronic medical condition.

Tripathi N, Shankar RK, Baghdassarian A. Nutritional Rickets Presenting as Chronic Episodic Extremity Pain in a 9-year-old with Autism. *Clinical Practice and Cases in Emergency Medicine.* 2018;2(3):251-254.

Until health providers are made aware that anywhere from 41.7- 90% of autistic children have ARFID, families will continue to be put at risk of further stress by accusations of abuse and unnecessary separation. This was the case report of a 9-year-old girl with autism and ARFID who presented with rickets, a severe vitamin D deficiency. The authors had the following to say regarding the care of children with disabilities in this situation:

"When children present with chronic bone pain to the ED, clinical suspicion is generally high for physical and sexual abuse... children with disabilities are at higher risk for physical/emotional abuse than those without disabilities. Hence, we entertained this diagnosis in the pediatric ED while the workup was ongoing and the Child Protective Team was consulted."

Zickgraf HF, Ellis JM. Initial Validation of the Nine Item Avoidant/Restrictive Food Intake Disorder Screen (NIAS): A Measure of Three Restrictive Eating Patterns. *Appetite.* 2018;123:32-42.

There are currently a limited number of self-report assessment instruments to measure behaviors related to ARFID. This 9-item screener looks at three categories of eating disturbance that may lead to ARFID: low appetite/limited interest in eating, selective eating due to the sensory properties of foods, and food-related phobias. The study provides preliminary support for the validity and internal consistency of the NIAS.

Kupferstein, H. Evidence of Increased PTSD Symptoms in Autistics Exposed to Applied Behavior Analysis. *Advances in Autism.* 2018;1(1):19-29.

In order to support non-maleficence, it is critical to be mindful of the interventions which we promote. This large online survey of autistic persons and their caregivers (n=460) found that exposure to applied behavior analysis (ABA) in autism early childhood interventions was associated with a higher rate and more severe post-traumatic stress disorder symptomology than those who were not exposed to ABA.

Eating Disorder Groups: IFEDD (www.eddietitians.com), NEDA (www.nationaleatingdisorders.org), EDC (www.eatingdisorderscoalition.org), IAEDP (www.iaedp.com)

SCREENER INFORMATION

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The proposed *Food Selectivity Screener-Revised (FSS-R)* is a short screening questionnaire which can be used to learn about the dietary patterns of children between the ages of 18-24 months. It has not been validated or studied yet, but it has the potential to be used as a tool by healthcare providers and caregivers to help them discern when atypical eating patterns may be something more serious.

- *The FSS-R fails to ask about the child's weight status.* Pediatricians assess for FTT at every well-baby visit, so asking for weight status would be redundant. As the systematic review has shown, the majority of children with nutritional deficiency illness due to ARFID are within normal weight parameters, so asking about BMI percentile will not help identify the condition.
- *The FSS-R asks if the caregiver considers the child to be a picky eater.* There were no cases where caregivers of children who developed nutritional deficiency illness had identified them preemptively as having an eating disorder, but in several cases the parents identified the child as being a “picky eater,” “not eating well,” or having a “very poor diet.”
- *Why ask about multivitamins?* None of the children in the systematic review who presented with nutritional deficiency illness had reported taking a multivitamin. A daily multivitamin appears to protect children from nutritional deficiency illnesses related to ARFID.
- *The FSS-R asks whether the child has been diagnosed with developmental delay or autism.* The presence of developmental delay or autism increases the risk of selective eating behaviors, and should be considered a risk factor for ARFID. However, it is important to note that this screener is intended for children ages 18-24 months, and very few children will have an autism diagnosis by that age.
- *Why does the FSS-R ask whether each food group has been consumed in the past week?* None of the children with ARFID who presented with a nutritional deficiency illness were consuming foods from all of the food groups on a regular basis, so avoiding an entire food group increases nutritional risk. This finding from the systematic review is in accordance with the *Framework for Defining Food Selectivity by Severity*, presented in the 2016 FNCE talk *Detection and Treatment of Severe Nutritional Deficits in Autism*. Severe food selectivity was defined as complete rejection of one or more food groups, and acceptance of a total of five or fewer food items. Though this would catch most of the children who suffered from a nutritional deficiency illness, a few of the children in this review were regularly consuming as many as 10 items. Practitioners must determine whether the information provided is a typical week for the child, or whether the child is in the middle of a food jag (which should last no longer than 2-3 weeks, since scurvy can develop in four).
- *The FSS-R asks the caregiver to name the foods eaten if 1-2 foods are consumed in a food group.* This information will help practitioners determine whether essential nutrients are missing from the diet of those at risk. There were no cases of deficiency illness which occurred while the child was still breastfeeding or using formula. If the child is breastfeeding or using formula, they should be rescreened once they wean.
- *The FSS-R asks about special diets which have been implemented at home.* This question helps differentiate between caregiver-imposed and self-imposed dietary restrictions.

Proposed Food Selectivity Screener-Revised (FSS-R)

Please answer these questions about your child. Keep in mind your child's usual dietary pattern. If your child has taken a couple bites of a certain food in a month, but does not usually consume this food, this is not part of his/her usual dietary pattern. Thank you very much.

General Patient Information

In general, would you call your child a "picky eater"?

- Yes No

Does your child take a multivitamin?

- Yes No, not offered to child No, child refused

Has your child been diagnosed with autism or developmental delay?

- Yes No, but has not been screened No, and has been screened

Dietary Variety

In the past 7 days, how many different types of food in the GRAINS group (e.g. bread, rice, crackers, cereals, cookies, noodles) did your child consume?

- 3 or more 1-2 (please name them) _____ None

In the past 7 days, how many different types of food in the DAIRY group (e.g. fortified non-dairy milk alternative, yogurt, cheese, milk, ice cream) did your child consume?

- 3 or more 1-2 (please name them) _____ None

In the past 7 days, how many different types of food in the FRUITS group did your child consume?

- 3 or more 1-2 (please name them) _____ None

In the past 7 days, how many different types of food in the VEGETABLES group did your child consume?

- 3 or more 1-2 (please name them) _____ None

In the past 7 days, how many different types of food in the PROTEINS group (e.g. eggs, beans, chicken, fish, pork, beef, nuts) did your child consume?

- 3 or more 1-2 (please name them) _____ None

Additional Information

Does your child follow a special diet at home, such as gluten-free, casein-free (GF/CF)?

- Yes (please describe) _____ No

Please share any additional concerns that you have regarding your child's diet.