

Vitamin A Deficiency and Visual Impairment in Children with Autism Spectrum Disorder

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Description

The demographics, weight statuses, and dietary patterns of people with autism or the broad autism phenotype who experience a severe nutrient deficiency disease due to symptoms of avoidant/restrictive food intake disorder have not been well established. The primary objective of this review was to examine the relationship between the demographics, weight statuses, dietary patterns, and nutrient deficiency diseases that characterize the most severe manifestations of avoidant/restrictive food intake disorder symptomology associated with autism or the broad autism phenotype. Additional cases were identified through the reference list of all included articles. The Only case reports or case series in which a person of any age who had been identified as having a formal diagnosis of autism or autism symptoms and a disease of nutritional deficiency due to self-imposed dietary restrictions were included. Data were independently extracted by 8 authors using predefined data fields. A total of 76 cases (patients were aged 2.5 to 17 years) from 63 articles that were published from 1993 through 2019 were found. More than 85% cases (65 of 76 patients) were from articles published in the past 10 years. The largest percentage of published cases 69.7% cases (53 of 76 patients) involved scurvy, a vitamin C deficiency. The second-largest percentage of published cases 17.1% cases (13 of 76 patients) involved eye disorders secondary to vitamin A deficiency.

Neurodevelopmental Disorders

Other primary nutrient deficiencies reported were thiamin, vitamin B-12, and vitamin D. In 62.9% (22 of 35) of the patients for which a body mass index or a weight percentile for age was provided, the patient was within normal weight parameters, per centers for disease control weight status categories. Based on the 63 articles extracted for this systematic review, nutritional deficiency diseases related to inadequate intakes of vitamin A, thiamin, vitamin B-12, vitamin C, and vitamin D were found in individuals with autism and the broad autism phenotype who had severe self-imposed dietary restrictions. When weight information was provided, most of the youth in these cases were not reported to be underweight. Individuals of any weight who present with symptoms of avoidant/restrictive food intake

disorder can benefit from early and frequent screening for adequacy of micronutrient intake, regardless of whether they have a clinical diagnosis of autism. Although foreign body ingestion is a common medical issue, intestinal perforations following foreign body ingestion are rare. Diagnosing foreign body ingestion is challenging especially in children with neurodevelopmental disorders such as Autism Spectrum Disorder (ASD). It is believed that approximately 80%–90% of ingested foreign bodies pass through the gastrointestinal tract without causing any luminal damage, and only approximately 1% of foreign bodies are known to remain lodged within the bowel and cause luminal erosion and perforation. A 14-year-old boy, diagnosed to have autism spectrum disorder was brought in by his parents to our hospital with Right Lower Quadrant (RLQ) abdominal pain and fever. On examination, he was tachycardic and there was direct tenderness over the RLQ of the abdomen. Acute appendicitis was entertained and the patient was examined with ultrasound.

Malnutrition and Vitamin De iciency

The ultrasound reported, “The tip of the appendix was dilated (0.62 cm) and there is minimal RLQ intra-peritoneal fluid collection”. With the impression of acute appendicitis, the patient was explored and he was found to have a cecum perforation due to an ingested foreign body. Initially we did tube cecostomy but later we did right hemicolectomy because the cecostomy tube had leaked. Foreign body ingestion should be taken into account during the evaluation of children and adolescents with neurodevelopmental disorders who presented with acute abdominal pain. Since diagnosis is difficult clinicians who are involved in acute care medicine should take a thorough history with a high index of suspicion for foreign body ingestion. Malnutrition and vitamin deficiency are growing concerns in the clinical management of children with Autism Spectrum Disorder (ASD). This case report presents a boy with ASD who developed vitamin A deficiency during follow-up. A 7-years-old boy had been diagnosed with ASD and developmental delay at age 18 months. He developed convulsions associated with hypocalcemia and vitamin D deficiency at 3 years of age. Although vitamin D supplementation was continued, he was only able to eat rice, green tea, and fried potatoes from 3 years of age

to age 7 years. He had started rubbing his eyes and had refused to open his eyes 9 months before. An ophthalmologic examination showed bilateral corneal ulcers and right corneal perforation. Vitamin A was immediately supplemented with a nasogastric tube; however, his right eye was surgically enucleated against the persistent infection. A search of the relevant literature from 1993 to 2020 identified 11 cases of patients with ASD (5–17 years of age) who developed vitamin A deficiency owing to malnutrition. Only 4 cases (36%) had a full recovery in visual acuity. Vitamin A deficiency frequently causes irreversible visual impairment in children with ASD. Vigilant monitoring of vitamin levels prevents unfavorable outcomes in children with ASD and difficulty in food intake. Autism spectrum disorder covers a group of behaviorally defined disorders that may result in the patient having difficulty staying calm during medical treatments, due to anxiety-related overreactions. Tibial fractures are the third most common pediatric long-bone fracture. Conservative treatment is selected in many cases, but surgical treatment may be selected in cases of open fracture and no treatment policy has been established. We described the case

of a 6-year-old boy with autism spectrum disorder who was unable to stay calm due to anxiety and required sedation. We diagnosed open tibial shaft fracture (Orthopedic Trauma Association classification 42A1, 4F2A; Gustilo classification type 1). On the day of injury, we performed osteosynthesis using a ring external fixator and primary closure of the open wound. Full weight-bearing was permitted from immediately after surgery. No significant complications were observed postoperatively, and the external fixator was removed 84 days postoperatively. No abnormal alignment of the lower leg, leg-length discrepancy or range of motion disorder was identified. To the best of our knowledge, no other reports have described use of a ring external fixator for open tibial shaft fractures in children with autism spectrum disorder. Using a ring external fixator appears helpful for open tibial shaft fractures in children who are unable to stay calm due to autism spectrum disorder, because there is no need to limit weight-bearing immediately after surgery. For Gustilo classification type 1 pediatric open fracture, primary closure of the open wound is safe after sufficient bone fixation.