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CASE REPORT

Optic neuropathy due to nutritional deficiency in a male adolescent with Avoidant/Restrictive Food Intake Disorder: a case report

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Introduction

The DSM-5 diagnostic criteria for Avoidant/Restrictive Food Intake Disorder (ARFID) describes a cohort of patients who exhibit restrictive or avoidant eating behaviors. These behaviors often result in significant weight loss, growth compromise, a reliance on nutritional supplements to meet daily energy requirements, nutritional deficiency (e.g., iron deficiency anemia) and/or marked interference with the patient's psychosocial functioning. Patients with ARFID do not fear weight gain, are not dissatisfied with their body weight, shape, or size, and lack any cognitions typically associated with Anorexia Nervosa (AN).

The aim of the present case report is to expand awareness on ARFID, discussing a patient with multiple comorbidities and a particular clinical presentation.

Case report

The present case report describes and discusses an 18 years old male subject (S) visited at an ophthalmology clinic due to visual loss, and then referred to our psychiatry clinic.

S reported a progressive decrease in vision, started three months before. At a first physical examination S looked pale, with no additional physical complaints besides visual loss. The patient was unable to see any figures on the Ishihara color plates, although he could identify colors on large objects with each eye. Visual acuity was 20/600 bilaterally, and an Optical coherence tomography scan (OCT) highlighted a severe bilateral optic disk edema. Other features included a slight thickening of the Retinal nerve fiber layer (RNFL), full peripherally visual fields with bilateral central scotomas to confrontation, full reactivity of both pupils to light, and full extraocular movements.

First blood examination showed hypoproteinemia (5.3 g/dL, normal range 6.4–8.2 g/dL), mild anemia (13.9 g/dL, normal range 14–18 g/dL), hypophosphatemia (2.3 mg/dL, normal range 2.5–4.8 mg/dL), mild proteinuria (30 mg/dL, normal range 0–10 mg/dL), severe B12 (165 pg/ml, normal range 254–1320 pg/ml), and folate (1.7 ng/ml, normal range 3.10–17.50) deficiency.

A cervical and brain MRI scan excluded common causes of optic neuropathies possibly leading to compressions of the optic nerve (CNS malignancies, vascular abnormalities, and aneurisms). Furthermore, there was no history of cerebral trauma which could explain the patient's progressive visual loss. Values of antinuclear antibody (ANA), anti-double-stranded DNA antibody (anti-dsDNA), perinuclear anti-neutrophil cytoplasmic antibody (P-ANCA), cytoplasmic anti-neutrophil cytoplasmic antibody (C-ANCA), and anticardiolipin antibody were overall normal. This allowed us to exclude a vasculitis-induced optic neuritis. Results of esophagogastroduodenoscopy (EGD), electrocardiography (ECG), neurologic physical examination, and abdominal ultrasound did not reveal any abnormality. Ear, nose, and throat (ENT) assessment showed no structural abnormalities.

The patient's mother expressed her concern that S did not have a healthy diet. She described him as a "picky eater" and gave an account of a typical day's intake consisting of a very limited range of foods.

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S was diagnosed with "Bilateral optic neuropathy due to nutritional deficiency" and referred to our psychiatry clinic, to examine in depth his eating habits.

According to our assessment, the patient had no history of mental diseases; he appeared slightly anxious and suspicious, with speech minimal but normal in rate and rhythm. Motor activity was normal. He was well oriented to space and time, and mood was congruous and mildly depressed due to visual impairment. Anxiety levels were high only during meals. Montgomery-Asberg Depression Rating Scale (MADRS) scored 8, and Hamilton Anxiety Rating Scale (HAM-A) scored 9. Neither fear of weight gain nor bingeing nor purging habits were described, as well as choking phobia. He showed no pathological body dissatisfaction. There was no formal thought disorder.

S referred neither hallucinations nor abnormal olfactory perception during mealtime. No decline in cognitive functions was observed. Memory and attention were intact. He reported no suicide ideation. S reported having a good social functioning, as his peculiar eating habits did not stop him from going to restaurants or birthday parties. Finally, he denied any kind of sexual relationship and even any sexual desire.

S was 172 cm and 62 kg (BMI 21 kg/m^2), and admitted having very selective eating habits: right after adenoidectomy at age 3, he began eating only chocolate, biscuits, milk, French fries, apples, and ice creams. His mother added that he tended to graze rather than sit down for a meal, and that the patient's brother also had a brief history of very selective eating habits, which later remitted.

S ascribed his eating pattern (which he did not consider problematic) to nausea in the presence of other types of foods.

Using DSM-5 criteria, the patient was diagnosed with ARFID and prescribed with B12 injections, oral folate supplements, and, in order to manage anxiety symptoms during meals, Sertraline up to 150 mg/day. A multidisciplinary treatment plan included contributions from: dietitians, nursing staff, psychologists, psychiatrists, and ophthalmologists. With the help from dietitians and nursing staff, S slowly began eating a few new foods such as meat and pasta, and improved the nutritional adequacy of his diet, which was more varied at discharge. Main goals during hospitalization were the decrease of anxiety levels during meals and the restoration of adequate vitamin B12 and folate levels. After one month of treatment, there was an improvement in his right eye vision with 17/17 on the Ishihara color plates and a moderate increase of RNFL thickness, whereas no improvements of his left eye vision were observed.

During hospitalization and after discharge, S underwent an individual cognitive behavioral therapy, accompanied by psychoeducational sessions for his parents. Core strategies included behavioral techniques, cognitive restructuring, and anxiety management. The therapist wanted to address some major goals: informing S about the consequences of his diet, improving his knowledge about a healthy diet, and increasing responsibility for his own health.

The patient has been followed up for one year, and he has not experienced any further recurrence of visual loss nor further improvements.

Discussion

Already before the publication of DSM-5 [1], Bryant-Waugh et al. (2010) revised available literature about Feeding Disorder of Infancy or Early Childhood and highlighted a variety of clinically significant presentations, characterized by avoidance or restriction of eating [2].

Among various clinical subtypes, the authors described *functional dysphagia* as characterized by the absence of weight/shape concerns and avoidance of food due to specific fears. In general, these children are fearful of eating, and in particular of eating lumpy or solid foods, for fear that it may cause them to gag, choke, or vomit [2]. This behavioral pattern strongly overlaps what observed in the subject of the present report (i.e., the inability to eat a high variety of foods due to appearing nausea). From an etiological point of view, it is worth noting that pain experienced by S at 3 years old following an adenoidectomy, could have represented a traumatic experience.

In 2013, DSM-5 workgroup created ARFID category to improve clinical utility by better classifying patients who would have previously fallen in the broad category of Eating Disorder Not Otherwise Specified (EDNOS) or Feeding Disorder of Infancy or Early Childhood [1]. However, there are still limited data on the epidemiology, treatment options and clinical outcome of ARFID patients and this case report aims to expand awareness on them and to evaluate a possible treatment strategy.

To our knowledge, this is the first case of a patient meeting the diagnostic criteria for ARFID and presenting a progressive visual loss. Mroczkowski et al. described a case of a young woman with severe AN and reversible vision loss secondary to malnutrition [3]. However, in that subject of the cited study, malnutrition and consequent vision loss were deeply influenced by alcohol abuse, a factor absent in our case. As for S, vitamin A deficiency was not observed, even though he reported vision loss too. On the other hand, further expected micronutrient deficiencies could have been iron and creatine deficiencies due to the absence of meat in S' diet. Vitamin B6 and zinc could have been scarce due to the absence in the diet of fish, meat, or egg. Folate deficiency might indirectly have

caused thiamine deficiency, which could also have been lowered by the absence in the diet of both meat and legumes.

It seems not possible to give a ''typical'' description of ARFID as this diagnosis covers a range of different clinical presentations [2]. Treatments may vary across individuals and are generally informed by the main areas of impact of the avoidance or restriction of food intake. They will generally include psychological interventions, nutritional advice or intervention, and medical monitoring or intervention. The observed progressive conversion of some ARFID patients to AN, make it critical a therapeutic follow-up also after discharge.

Due to the lack of specific clinical trials, there are yet not targeted guidelines for the pharmacological treatment of ARFID patients. In our opinion, it would be crucial to address psychiatric comorbidities: several studies have assessed psychiatric comorbidities in ARFID patients, often identifying higher comorbidity of anxiety disorders and lower comorbidity of mood disorders compared with other eating disorders' (EDs) patients. A multidisciplinary treatment approach, including both medical interventions and cognitive behavioral specialists, is generally recommended, and SSRIs could be a useful therapeutic approach in those cases showing high anxiety levels.

Conclusions

ARFID is a new DSM-5 diagnosis, summarizing a broad range of clinical presentations [2]. The present case report (a male adolescent presenting ARFID symptoms and associated visual loss) highlights the importance of a multidisciplinary approach for the evaluation of this disorder. The diagnosis of ARFID in the subject of this study occurred many years after a very selective diet, when the malnourished state has become evident only due to visual loss. Expanding the awareness of general physicians and pediatricians and an early referral to a psychiatrist are crucial steps to prevent the different possible consequences of this disorder.

Compliance with ethical standards

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Conflict of interest All the authors declare the absence of any potential conflicts of interest, including specific financial interests and relationships and affiliations relevant to the subject of the manuscript.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or nationalresearch committee and with the Declaration of Helsinki and International Conference on Harmonisation/Good Clinical Practice guidelines and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the study.

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