

CASE REPORT

A life lost to anorexia nervosa: A case report of rapid progressive disease and its psychological aspects

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Key Clinical Message

The prevalence of anorexia nervosa has been on the rise. Exploring key factors in treating this condition as well as psychological factors influencing the onset and maintenance of the disorder can increase the chance of treatment success.

KEYWORDS

anorexia nervosa, eating disorder, infective endocarditis, medical complications, psychological aspects

1 | INTRODUCTION

Anorexia nervosa (AN) is a complex psychiatric disorder with a high mortality rate that can also be life-threatening.^{1,2} The prevalence of this disease throughout life is 4% in women and 0.3% in men.² In recent decades, the incidence of AN has increased among adolescents, with the peak age for onset between 15 and 19 years old.³

Clinical symptoms of the disease include fear of weight gain and/or behaviors that interfere with weight gain, restricting energy intake, and disturbance in perception of the body.⁴ Despite the commonly held belief that the presence of body image distortion is necessary for diagnosing AN, the patient's persistent poor insight into the severity of weight loss and the seriousness of their condition should be sufficient for diagnosis.⁵

In this case report, we have focused on the impact of various factors, especially the psychological aspect of the disorder and the role of the family in managing symptoms and treatment of the disease.⁶ The construct of expressed emotion (EE), the needs of the caregivers, and the role of perfectionism in AN will be discussed in this article. In the previous research, Treasure and Nazar identified three general factors, including illness-related factors such as symptom severity, physical complications, and the patient's resistance to change, caregiver-related factors such as personality traits, and social factors such as treatment costs and stigma, all of which influence caregivers' experience and can increase their psychological distress.⁶

The EE is a construct that assesses family relationships with the patient in five specific domains, including critical comments, hostility, emotional over involvement, warmth,

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and positive remarks.⁷ Studies have indicated that high levels of EE within a family lead to the exacerbation of relational problems and an increase in negative emotions, potentially contributing to the maintenance and even intensification of various disorders, especially AN.^{7–9}

Perfectionism is often described as striving for extremely high or unreachable standards and reacting negatively to oneself when those standards are not met.^{10–13} Various studies have reported a relationship between perfectionism and depression, suicidal ideation, anxiety disorders, eating disorders, and other mental health problems.^{14–18}

A very important point is that the aim of this case report is not to blame families as the cause of the illness; rather, attention should be given to the caregiver's needs, as well as important psychological factors in exacerbating the severity of the disease to increase the family's role in the treatment and improving the chances of recovery.

2 | CASE PRESENTATION

2.1 | Investigation

The patient, Ms. N, a 14-year-old adolescent girl with no previous psychiatric history, presented to the hospital with complaints of weight loss.

During the initial psychiatric evaluation, the patient appeared significantly pale and underweight, which was particularly evident in her facial features. She did not establish appropriate eye contact, showed no emotional expression, her mood was depressed, and was obsessively engaged with her smartphone. Her attitude was guarded during the interview. Her weight upon admission was 28 kg, and her height was 169 cm, resulting in a BMI of 9.8 kg/m², placing her in the severely underweight category.¹⁹

Her weight loss began approximately 7 months before admission, coinciding with the start of the new school year, and dropped from 58 to 28 kg. No medical treatment had been sought for her weight loss.

Both of the patient's parents were employed and had good economic conditions. The patient was the second child in the family. Despite providing for their children's needs, family dynamics were conflicting, and the primary source of this conflict was the patient's refusal to eat. The logical and natural concerns of the parents, alongside ineffective communication patterns, led to relational problems within the family. For instance, despite that the patient expressed no desire to eat after having a small amount of food, she displayed obsessive interest in watching cooking videos, viewing food images, and searching for various recipes. According to the mother's report, "It

seemed like she was trying to alleviate her hunger in this way." She had no appetite for any kind of food, and the type and flavor of the food did not make any difference in her appetite. When her parents couldn't persuade her to eat, they restricted her phone usage in an attempt to compel her to eat, which further exacerbated relational issues between the patient and the family.

Her academic performance and grades were always above average. She had no close friends throughout her school years and did not mention any history of bullying at school. After the start of the new school year, due to the transition from junior high school to high school, there was a brief decline in the patient's academic performance. This decline, while natural in the context of the transition, led to severe anxiety for the patient. We think that one of the main causes of this intense anxiety was her perfectionism, which made it difficult for her to cope with this temporary decline like her classmates. The anxiety stemming from her perfectionism led to the exacerbation of her academic decline, and this decline, exceeding that of other classmates due to this severe anxiety, was met with reactions from family and teachers. They demanded that she put in more effort to improve her grades, which worsened the situation. The combination of these factors created a vicious cycle leading to increased anxiety, heightened feelings of inadequacy, and further decline. Her perfectionistic trait was also observable in other areas. For instance, the patient reported that when drawing, every detail had to exactly match the original painting; otherwise, she would set the painting aside and start over from scratch. She showed her sketchbook to the interviewers. All the drawings were black and white, and Ms. N expressed no interest in creating colorful drawings. According to the patient's mother's report, the patient only wore black clothing and was not inclined to wear any colors other than black. Another contributing factor to her anxiety was her inability to demonstrate excellent performance in multiple diverse areas. For example, she mentioned that each of her classmates was competent in a specific area, but she wanted to simultaneously perform flawlessly in all domains, such as painting, programming, and English, beyond the usual school duties.

2.2 | Diagnosis, treatment, and follow-up

Upon admission and during the course of hospitalization, biochemical, hormonal, serological, urinal, VGB, and CBC tests were conducted, and the results, along with vital sign changes, are reported in [Table 1](#). During the hospitalization and due to muscle weakness, the patient had a falling incident. To ensure the absence of brain damage, a CT scan of the brain was performed,

TABLE 1 The result of tests on Days 1, 5, and 10 of the hospitalization.

	Upon admission	After 5 days	After 10 days
Age	14	-	-
Sex	Female	-	-
Height (cm)	169	-	-
Weight (kg)	28	28.5	28.9
BMI (kg/m ²)	9.8	10	10.1
Weight loss (kg)	30	-	-
Temperature (C)	36.5	37	38.5
Pulse (per minute)	90	80	120
Skin	Dry skin (xerosis), hair loss, nail fragility	-	-
Muscle	Severe muscle atrophy	-	-
WBC (×1000/mm ³)	3.3	2.4	21.25
RBC (million/mm ³)	4.1	3.05	3.5
Platelet (×1000/mm ³)	82	65	449
Hb (g/dL)	10.9	5.7	10.1
G.6.P.D	Sufficient	Sufficient	Sufficient
B.U.N (mg/dL)	43	6	35
Alkaline P (IU/L)	122	-	245
Amylase (U/L)	84	-	-
Serum Na (mEq/L)	145	139	138
Serum K (mEq/L)	4.2	3.6	3.9
Serum Mg (mEq/L)	2.2	2.5	1.8
Serum Ca (mEq/L)	8.9	7.1	7.9
Creatinine (mg/dL)	0.8	0.5	0.7
Uric acid (mg/dL)	8.3	4.8	-
Albumin (g/dL)	3.7	4.1	2.7
Blood sugar (mg/dL)	87	-	178
Cholesterol (mg/dL)	104	-	104
Triglyceride (mg/dL)	-	470	111
C reactive protein (mg/L)	72.4	46.3	41.1
Vitamin D3 (ng/mL)	88	100	20.6
T ₃ (ng/dL)	83	-	-
T ₄ (ng/dL)	3.6	-	-
TSH (micIU/mL)	2.2	-	-
FSH (mIU/mL)	0.21	-	-
Prolactin (micIU/mL)	358	-	-
Electrocardiography	-	327	397
Coombs Wright	Negative	Negative	Negative

revealing no signs of brain injury or abnormalities. The midline shift was not present, and both the brain parenchyma and cerebellar parenchyma showed normal density. The brain ventricles had a normal size, shape, and angle. The brainstem, CPA, pituitary gland, and sinuses appeared normal, and no evidence of hemorrhage was found. Ten days into the hospitalization, the patient developed a fever and respiratory distress. PCR tests for

COVID-19 and influenza virus were requested, with both tests yielding negative results. The blood culture showed the presence of staphylococcus aureus, gram-positive cocci, sensitive to doxycycline, linezolid, and vancomycin. The patient's treatment commenced with intravenous antibiotics including vancomycin, cefazolin, and meropenem. A transthoracic ECHO and an ECG were performed to assess cardiac status, revealing

a QTc of 397 ms. the size of the right atrium and ventricle were normal, with mildly dilated main pulmonary artery (MPA) and mild pulmonic insufficiency, no abnormal wall motion, and an ejection fraction (EF) of 55% to 58%. Additionally, a 2×2 cm mass connected to the mitral valve was identified, which specialists were unsure whether it was a vegetation or a clot. According to the patient's medical record, an echocardiogram was performed 2 months earlier, which was completely normal, and no mass was found in it. Over the next 2 days, the patient's cardiac condition rapidly deteriorated. A bedside ECHO indicated mild left ventricular enlargement with severe systolic dysfunction (EF = 15%–20%) and mild right ventricular enlargement with mild to moderate systolic dysfunction. No pericardial effusion was observed, but pleural effusion on the left side was present. Following the diagnosis of infective endocarditis and severe mitral regurgitation, the patient was transferred to a specialized cardiac hospital for open heart surgery to repair the mitral valve and remove the vegetation. After the surgery, due to continuous fluid drainage from the chest tube, a lung CT scan was requested, revealing widespread pulmonary infection. Due to the severity of the lung infection, the patient was intubated and received antibiotic therapy. Nevertheless, the treatment interventions were not effective, and the patient passed away after a few weeks. During hospitalization in our hospital, daily psychiatric and psychological visits were conducted and parents and the patient herself reported that these sessions were effective in reducing their anxiety and increasing their awareness of the disease. Furthermore, multiple consults were performed, including pediatric neurology and neurosurgery, ophthalmology, hematology, endocrinology, rheumatology, and nutrition therapy. Prescribing oral olanzapine (5 mg/daily) improved the patient's sleep and appetite. However, nurses reported that after taking olanzapine and improving her appetite, compensatory behaviors such as walking were observed. Due to severe muscle atrophy, olanzapine could not be given by injection.

3 | DISCUSSION

Anorexia nervosa is a subgroup of eating disorders characterized by fear of weight gain, having a disturbance in body image, and restricting energy intake. It is associated with psychological and medical complications, such as cardiac and gastrointestinal problems.²⁰

The results of studies to find an effective pharmacological treatment for AN have been mixed. Researchers suggest that in some AN patients, impaired body image perception and misperception of the severity of

low weight have a psychotic quality, therefore. Anti-psychotic medication, especially atypical antipsychotics due to fewer side effects, could be a sensible option to address these incompatible cognitions. The most frequently studied atypical antipsychotic in AN is a dopamine receptor antagonist called olanzapine. It induces significant weight gain in patients with psychosis and mania. Studies show that prescribing olanzapine at a dosage ranging from 2.5 to 10 mg/day can lead to faster and greater weight gain compared to the control group.^{21,22}

Studies have examined the effectiveness of various psychological interventions on AN. The focus of this article is on examining the psychological factors and the role of the family in the treatment of the disorder and management of symptoms. This section explores the relationship between EE, the needs of the caregivers, and the patient's perfectionism and AN.

3.1 | The role of family

Studies have shown that family involvement in the treatment of AN is essential for achieving a positive prognosis, both in the short term and long term.^{23–26}

In their article, Schmidt and Treasure discussed the role of EE in maintaining behaviors and beliefs related to AN.²⁷ According to this article, caregivers and relatives often fail to persuade the patient to change their behavior, and the patient's success in defending their behaviors and beliefs leads to an increased sense of control and agency, reinforcing AN-related behaviors in them. They also continue to explain that this situation will lead to high EE interaction in two ways. In the first scenario, caregivers and family members who have failed to change the patient's behavior react to the situation with overcontrolling, hostility, and criticism. In the second scenario, parents, especially mothers, avoid any conflicts and devote all their time and attention to taking care of the patient. As a result, other family members, who are neglected in their needs, express high levels of negative emotions toward the patient.

In the case of Ms. N, the primary cause of conflict between the patient and her parents was her refusal to eat. Due to the high EE in the family, child-rearing at times involved punitive measures. For example, following the onset of weight loss, the patient developed an obsessive interest in watching cooking videos and food images and searching for various recipes. Her parents, after failing to persuade her to eat more through encouragement or reasoning, resorted to disciplining her by depriving her of using her smartphone or sending her to her room, resulting in a high EE environment.

3.2 | The needs of caregivers and interventions

AN is a challenging and complex experience for caregivers, leading to psychological distress and high levels of anxiety.²⁸ Despite the involvement of caregivers in the treatment process, in many cases, the focus of treatment is primarily on the patient's needs, and the needs of caregivers are not adequately addressed.

In a study involving 277 primary and secondary caregivers of patients with eating disorders, Sepúlveda and colleagues (2012) reported that factors such as social isolation, lower educational levels, the impact of nutritional aspects, difficulties with professional services, and being single parents (divorced, separated, or single) are among the factors that can lead to increased psychological distress in caregivers.²⁹

Furthermore, on many occasions, the needs of caregivers of patients with AN are not met about receiving information.^{30,31} Caregivers require sufficient and practical information about available treatment options, the prognosis of the disease, coping strategies, recommendations for managing relapse, information about support groups, and guidance on how to seek counseling.³¹

In their 2015 study, Hibbs and colleagues examined the effectiveness of a skill training intervention on a sample of severe AN patients and their caregivers.³² The results of this study indicated that in patients whose caregivers received the intervention, the quality of life improved, and symptoms related to the disease decreased. Additionally, the caregiver burden, EE, and the time spent caring for the patient decreased 6 months after discharge.³²

In the case of Ms. N, during her hospitalization, several educational sessions were held to address caregivers' questions about the cause and prognosis of the disease. Caregivers, namely, the mother, reported that these sessions led to a reduction in their anxiety and psychological distress. However, continuing these sessions was not possible due to the rapid deterioration of the patient's medical condition.

3.3 | Perfectionism and AN

Perfectionism is considered both a risk factor and a maintaining factor for AN.^{33,34} Individuals with high levels of perfectionism often have greater concerns about weight and body image and may be more vulnerable to developing disordered eating behaviors.³⁵ In a study conducted in 2020, Welch and colleagues observed that perfectionism predicts treatment outcomes for psychopathology related to AN.³⁶ They concluded

that interventions targeting perfectionism can improve the outcomes of AN treatment.

In the case of Ms. N, as previously mentioned, with the start of the new school year, due to the patient's predisposition to anxiety and her perfectionistic personality traits, which was also observable in other family members, a minor decline in academic performance had triggered severe anxiety. Additionally, the patient expressed frustration about her inability to perform at a high level simultaneously in entirely different domains, such as painting, programming, and English. She also mentioned that when drawing a painting from a sample, she had to match every detail to the sample; otherwise, she would start the painting from scratch.

4 | CONCLUSION

Anorexia nervosa is a complex disorder, and although its prevalence in the general population is not very high, even milder forms can lead to various physical and psychological problems.³⁷ High comorbidity with other psychiatric disorders, patient resistance to treatment, and the risk of death due to medical complications are among the factors that make the management of this disease challenging and emphasize the necessity of employing a multidisciplinary approach in treatment.^{38,39} As this case teaches us, AN is one of the psychiatric disorders that demonstrates the connection between the mind and the body. Moreover, in some cases, this disorder progresses very fast and can even be accompanied by other diseases such as infective endocarditis, which is very rare.⁴⁰ Therefore, educating psychiatrists, psychologists, physicians, and nurses can increase the chance of an early diagnosis and prevent serious consequences. Paying attention to family dynamics as an influential factor in the course of the disease, educating families to recognize its symptoms early, addressing the psychological aspect of this condition, and the importance of seeking help from mental health professionals can significantly reduce the risk of mortality. This aspect could serve as a direction for future studies.

AUTHOR CONTRIBUTIONS

Amirreza Esmaeili: Conceptualization; data curation; investigation; writing – original draft. **Soode Tajik Esmaeili:** Conceptualization; data curation; project administration; supervision; writing – review and editing.

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CONFLICT OF INTEREST STATEMENT

All the authors declare that there is no conflict of interest. The authors report no proprietary or commercial interest in any product mentioned or concept discussed in this article.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ETHICAL APPROVAL

The research has adhered to relevant ethical guidelines.

CONSENT

Written informed consent was obtained from the patient's parents to publish this report in accordance with the journal's patient consent policy.

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