Pathogenesis of anorexia nervosa

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ABSTRACT. Anorexia nervosa is a potentially life-threatening psychiatric disorder that threatens the life and health of the patient. Patients are characterized by a very low body mass index, rapid weight loss, an irrational fear of weight gain, and a distorted view of their body image. The disease is closely related to genetic factors, neuroendocrine imbalances, and psychosocial and family factors. In recent years, its morbidity and mortality rates have gradually increased. The causes of death are not only organ failure due to extreme starvation, but also complications due to overmedication and depression and suicide. Currently, nutritional therapy and psychotherapy are the main treatments for the disease. It is mainly found in the adolescent and female population, and the mortality rate of patients is very high. The study of the pathogenesis of anorexia nervosa is of great importance to actively improve the prognosis and save the lives of patients.

1. Introduction

Anorexia nervosa is a psychiatric disorder characterised by severe restriction of food intake and significant weight loss to the point of being life-threatening, and low body weight, accompanied by fear of obesity and body image disturbances. The clinical manifestations of anorexia nervosa are usually underweight, accompanied by self-induced hunger and a strong desire to gain weight. Women are particularly prevalent, with a prevalence of about 0.4%, more than 10 times that of men; adolescents and young patients are the main patients; athletes, dancers, and college students are the high-risk groups; the death rate of the disease is 9.8%, which is one of the highest mortality rate of psychiatric diseases, mostly seen in women aged 15 to 24 years old, and the cure rate is 50%, while the treatment effect is not significant and recurrent patients account for about 40%.

2. CLINICAL SYMPTOMS

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, 2013, sets the diagnostic criteria for this disorder: (1) a dramatic restriction of food intake that results in weight below the lower limit of normal weight (i.e., BMI below 18.5), in the significantly low weight range of BMI < 17; or below the minimum expected weight for children and adolescents, despite normal development and good health; (2) a significant low weight condition, strong fear of gaining weight despite significant low weight, or active interference with weight gain; (3) body image disturbance, negative self-image evaluation, and disregard for disease severity.

The 2017 11th Revision of the International Classification of Diseases classifies the disease into two types: Type A, or "restricting type," which is characterized by excessive dieting and excessive exercise; and Type B, or "binge-eating type or Type B, "binge-eating type or purging type", is characterized by intermittent overeating, diarrhea, and diuresis to remove food.

3. INFLUENCING FACTORS

In recent years, it has been widely believed that biological, psychological, and social factors together constitute the cause of the disease. As shown in Figure 1, several factors jointly lead to the patient's illness, and the disease will worsen the cause. This vicious cycle makes the cause extremely complex. The physiological abnormalities are mainly manifested by extreme wasting, often accompanied by malnutrition, metabolic and endocrine disorders; the psychological abnormalities are mainly manifested by body image disorders, endoreceptor disorders, bad moods such as depression, anxiety and fear. Co-morbid affective disorders are more common in this patient, and bipolar disorder occurs more often in young women with a higher degree of suicidal tendency; behavioral abnormalities are mainly characterized by restriction or refusal to eat, partial eating, picky eating, behavioral withdrawal, and reduced interpersonal interaction. Anorexia nervosa causes a variety of factors, not only to see its biological factors, but also need to pay attention to its psychological factors and social factors causing the disease. As a result, it is relatively difficult to diagnose anorexia nervosa, because people with anorexia nervosa may come back clean, be in denial about their illness, and dismiss behaviors such as dieting and skinny body image issues as abnormal or even proud of them. This leads to the need to consider, as appropriate, other mental and medical conditions that may be associated with weight loss, including depression.
3.1 Biological factors

The role of genetic factors in the pathogenesis of anorexia nervosa has been confirmed by pedigree studies and twin studies,5 where "micro-effects" genetic susceptibility interacts with environmental factors to cause a genetic disorder with an 11-fold higher prevalence in first-degree relatives than in the general population. However, the mode of inheritance and the genetic locus of anorexia nervosa have not been determined. The neurobiology of anorexia nervosa has been intensively studied, involving the neurotransmitters 5-hydroxytryptamine, norepinephrine, and dopamine, and there are multiple neuroendocrine abnormalities in anorexia nervosa. They tend to return to normal after clinical recovery. In terms of brain imaging, several CT studies have shown CSF gaps during prolonged starvation in patients with anorexia nervosa, with one study finding recovery with weight gain; functional imaging studies have found decreased metabolism and perfusion in frontal and parietal cortex in patients with anorexia nervosa, presumably with local 5-hydroxytryptamine dysfunction. 5-hydroxytryptamine is associated with punishment and behavioral inhibition mechanisms, i.e., when 5-HT concentrations are low in the body, individuals' motivation is reduced and feeding is decreased. Altered interoceptive awareness has long been considered a predisposing and reinforcing factor for anorexia nervosa, and early clinical descriptions of patients with anorexia nervosa emphasize the "failure to recognize features of the body state". Furthermore, interoceptive awareness has been a component of the Eating Disorder Inventory since its introduction by Garner et al. in 1983, and recent prospective studies have confirmed its role as a diagnostic criterion and risk factor for the development of eating disorders. However, interoceptive awareness is a single aspect of interoception, as studies have failed to distinguish between interoceptive sensitivity, which is measured by objective tests of interoceptive accuracy, and interoceptive awareness, which is measured by self-report questionnaires such as the Eating Disorders Inventory. A recent paper showed that in patients with anorexia nervosa, deficits in interoceptive sensitivity and interoceptive awareness were in fact uncorrelated with assessed levels of depression and anxiety. Thus, the authors suggest that interoceptive awareness is not a measure of visceral sensitivity per se, but rather a reflection of specific disabling thoughts and feelings that influence the interpretation of visceral signals. However, there is evidence that both interoceptive sensitivity and interoceptive awareness are disrupted in anorexia nervosa.

3.2 Psychological factors

There are similarities in the psychological aspects that influence the onset and development of anorexia nervosa. It has been found that psychological aspects such as personality, mood, and cognition influence its development6. In terms of personality, most patients with anorexia nervosa have deficit-type personality traits. Common personality characteristics of patients with eating disorders have been found to be high neuroticism levels and low self-directedness, often with childlike temperament and personality traits such as obsessive-compulsive disorder and perfectionism. Most patients with anorexia nervosa also have high harm avoidance, and adverse life events can be a great stimulus for patients as risk factors for mental disorders. Researchers have suggested that adverse life events predict weight fluctuations, dieting and eating disorders in individuals during adolescence or early adulthood, and that psychosocial stress is a risk factor for weight gain. Therefore, from a psychodynamic theory point of view, sexual fear, childhood abuse, non-secure attachment or trauma may constitute psychological factors triggering the development of anorexia nervosa, even after a severe shock, maladjustment to a new environment, and...
excessive stress at work and school can be triggers for the disorder.

In terms of emotional factors, patients with eating disorders have significantly higher levels of negative emotions such as depression, anxiety and guilt than normal individuals. Patients with anorexia nervosa achieve emotional satisfaction by restricting eating to achieve a slimmer body as a way to temporarily relieve anxiety. Anxiety, depression, and irritability usually accompany the entire course of the eating disorder.

In terms of cognition, anorexia nervosa patients have somatoform disorder. Body image disorder was first introduced by Bruch in 1962 and is mainly characterized by a distorted perception of one's own image. Dissatisfaction with one's body is the main reason for the onset of anorexia nervosa. It has been found that most of the patients start the disease because they feel fat or others say they are fat, and the "fear of fat" plays an important role in the disease. Patients with anorexia nervosa can find a sense of self and identity in dieting. Patients with anorexia nervosa have an extreme fear of maturity, including weight gain, puberty, and sex, and anorexia nervosa can prevent these fears from occurring, reduce fears and low self-efficacy, and lead to a sense of security.

3.3 Social factors

Social factors generally include social system, social culture, socioeconomic level, media, family, religious beliefs, and occupation. Social factors and individual psychological factors intersect to influence the occurrence of anorexia and bulimia. The main social factors that trigger anorexia and bulimia are socio-cultural, media, family, and occupation.

Socio-cultural and media are the main social factors that trigger anorexia and bulimia. Current social and cultural values promote thinness as beauty, and slenderness is the ideal body shape that society promotes as a sign of confidence and success. It is generally believed that women with slim bodies are more likely to gain social acceptance and praise. This cultural value of thinness as beauty has become popular because of the media's promotion and the fashion industry's labeling, and the blind worship and pursuit of slimmness. Body attractiveness and image self-esteem constantly drive adolescents to diet, and a few adolescents progress to anorexia in love dating and relationships as a result. The promotion of slimmness in society continues to drive the prevalence of the disease. The more women identify with sociocultural propaganda, the more likely they are to develop eating disorders.

The family is a complex dynamic organization with many dimensions, and is a complex phenomenon that can be studied in various ways. It has been found that families of eating disorder patients have some commonalities in the family perceptions of anorexia nervosa patients emphasizing perfection, avoidance of harm, emotional restraint, appropriate behavior and tolerance of dissent; this makes anorexia nervosa a familial tendency, with more members of the patient's family exhibiting similar behavior. This suggests a genetic association on the one hand, and on the other hand, a possible association with family relationships such as parental conflict, parent-child conflict, parental divorce, and family eating attitudes such as mothers' attitudes and behaviors toward eating that influence their children.

4. INTERVENTIONAL TREATMENT

The goals of prevention and treatment of anorexia nervosa are weight gain, weight maintenance, optimization of food intake, and reduction of psychiatric symptoms. The etiology and pathogenesis of anorexia nervosa involves biological, psychological, and sociocultural factors, so different psychological treatments should be used for different patients, with individual and major systemic interventions. Biological treatment modalities include supportive therapy, nutritional therapy and pharmacological treatment. The current treatment for anorexia nervosa is mostly with SSRI (5-HT reuptake inhibitors) and atypical antipsychotics. Pharmacological treatment does not significantly increase the patient's body mass or improve his or her pathological psychology; therefore, pharmacological treatment alone is inappropriate and must be accompanied by psychological interventions in changing the patient's eating attitudes and behaviors.

In addition to medication and psychotherapy, positive guidance in the social environment is also critical. Social media should not only limit the definition of beauty in a narrow sense, but also advocate enriching the image features of beauty and prevent the limited thinking of "beauty by thinness". Especially young people's mental maturity is not mature, and it is easy to be affected by the environment, and they are also the main group of anorexia, so for young people in addition to social culture and media guidance, school and family health education is equally important, schools, families should take corresponding measures to intervene. Finally, let the patients establish the correct understanding of health "beauty", let them realize that too thin is a kind of self-abuse behavior. At present, the intervention of anorexia nervosa is still very limited. In the future research, it is necessary to improve and develop new intervention methods as much as possible.

5. CONCLUSIONS

Anorexia nervosa is an eating disorder with significant weight loss and potentially life-threatening effects, and its pathogenesis is complex; it presents a multifactorial interaction of biological, psychological and social factors. Currently, pharmacotherapy and psychotherapy, are the main therapies for this disease. In-depth research on the pathogenesis of neurogenic aspergillosis will help to analyze the complex pathological process of the disease, accelerate the development of new drugs, and provide new theories and methods for clinical treatment.
REFERENCES


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