

Anorexia nervosa: an overview¹

Meir Gross, M.D.

This brief overview of anorexia nervosa, which includes a description of the history, behavioral and medical symptoms, medical complications, and treatment, emphasizes the importance of obtaining a thorough history to establish an early diagnosis in patients who do not have the usual physical appearance of emaciation characteristic of this disorder.

Index terms: Anorexia nervosa
Cleve Clin Q 50:371-376, Fall 1983

The first detailed report on anorexia nervosa was published by Richard Morton in 1689, in which he described two patients whom he defined as suffering from "nervous atrophy." He described the symptoms of lack of menstrual periods, reduction in eating, followed by constipation leading to severe thinness and overactive behavior. About two centuries later, in 1874, William Gull in England¹ described the same syndrome coining the name "anorexia nervosa" since he believed it was due to a nervous morbid mental state of the patient. At about the same time in 1873, E. Charles Laseque in France² published a description of the same condition referring to it as "anorexia hysterique," based on emotional disturbances and changes in thinking defined by him as intellectual perversion.

Anorexia means lack of appetite. However, the appetite in anorexia nervosa is usually normal, but the patient tries to block or deny hunger to avoid eating. In this regard the term anorexia is a misnomer. The word nervosa suggests

¹ Department of Psychiatry, The Cleveland Clinic Foundation. Submitted for publication May 1983; accepted June 1983.

a nervous condition, which categorizes anorexia nervosa as an emotional disorder.

Anorexia nervosa is a somewhat baffling disease with an elusive cure in many cases.³ It seems to have increased in frequency during the past few years,⁴ possibly because dieting is so popular or anorexia nervosa is recognized more frequently. Recently, anorexia nervosa has become a popular subject in the mass media, and it is possible that some girls may choose it as a presenting symptom to other unconscious underlying conflicts.⁵ The disorder occurs predominantly in girls at a ratio of 9:1 usually during adolescence. It affects about one in 250 girls between the ages of 12 to 18 years. Regardless of its recent popularity, there are still cases that are not diagnosed in time. The results of several studies show that the mortality rate for anorexia nervosa is between 14% and 21%.^{6,7} Death may result from progressive starvation, electrolyte imbalance, or overwhelming infection. If weight loss becomes severe, hospitalization is required to prevent death. Despite these impressive mortality figures, there are cases of spontaneous recovery even without treatment. Conversely, other patients, even with intensive treatment, have episodic relapses regardless of the type of therapy. In males, anorexia nervosa usually occurs as a single episode with full recovery thereafter, especially if treatment is begun early.

The typical anorexic girl usually has a body image distortion. She feels fat or overweight even though she is emaciated. She is preoccupied with her size and appearance and frequently looks in the mirror. At times there is preoccupation with only part of the body such as thighs, breasts, or hips, with the patient claiming they look too big.⁸

Patients lose weight by reducing food intake or by eating only food low in carbohydrates or fat. They may induce vomiting to get rid of food immediately after meals or may take laxatives, diuretics, or enemas. Most tend to overexercise in an obsessive-compulsive manner for many hours every day.

At the onset of the disease there may be evidence of a stressful life situation, e.g., conflict in the family, environment, school, or peer group. These patients tend to be perfectionistic and usually were model children. Surprisingly, only one third of these patients were overweight before anorexia developed. They may begin dieting because of being mildly overweight and adapt obsessive-compulsive eating habits to lose weight as the primary goal. However, after they begin

to lose weight, they continue relentlessly to the point of severe emaciation. When a substantial amount of weight is lost, they become fearful of regaining it and will resist any pressure by parents or others to eat more. Fear of gaining weight can reach phobic proportions.

Medical complications

As the disease progresses there is significant weight loss to the point of severe emaciation. Adult patients who had been overweight may develop wrinkled skin, but this is seen only rarely in adolescent anorexic patients due to greater skin turgor. Newbornlike hair, called lanugo may appear on the body and alopecia of the scalp may occur.

When weight loss is profound, hypothermia may develop, along with bradycardia and hypotension. Leukopenia and hypogammaglobulinemia lessen resistance to infection. If there is laxative abuse or induced vomiting, hypokalemia may occur, causing cardiac arrhythmias, lethargy or even cardiac arrest. Initially, weight loss consists mainly of adipose tissue. This is followed by depletion of muscle tissues and hypoproteinemia. Short stature may result especially when the illness starts before puberty. If the illness becomes chronic and continues beyond age 17 or 18 when there is closure of the epiphyses, the patient will probably not attain full growth.

Amenorrhea is a common feature and usually occurs before substantial weight loss.⁹ Patients may ask about the possibility of having irreversible effects from the illness, especially of the reproductive organs. There is no known permanent damage. When the patient regains normal weight, she usually commences menstruation although there may be a few months delay after return to normal weight. In most cases patients should be able to conceive and deliver children.

Changes in personality

Changes in personality and behavior are apparent throughout the course of the illness. The patient may succumb to feelings of hunger and overeat, usually large amounts of carbohydrates. After these bingeing episodes, because of severe guilt and fear of gaining weight, the patient may induce vomiting (bulimia). Usually, the patients are preoccupied with thoughts of food most of the day. Many of them undertake elaborate preparations of foods and cook for others, but rarely eat and avoid the dinner itself with the family. Often, anorexic patients eat alone. They usually

eat slowly, cut their food into many small pieces, and do not finish the meal. Some hoard food but never eat it.

To suppress hunger, the patient involves herself in many activities. Many fear growing up and facing adult responsibilities and use anorexia to stop the growth process. Many have delayed psychosexual development to avoid coping with the transition of adolescence. Interest in sex is decreased, and few anorexic patients are interested in dating or getting married during the illness.

It has been speculated that the anorexic patient fears sexuality and oral impregnation, and that this is why she avoids eating, believing she might become pregnant by eating. I have seen hundreds of anorexic patients, but have rarely seen a patient who expressed any conscious or unconscious fear of oral sexuality, or who associated any symbolic sexual feelings with food. It seems that this notion has been transferred from one book to another without any attempt to substantiate it.

Fear of sexuality could be seen as part of the fear of growing up. A task of normal adolescence is achieving independence and separation from parents. The separation is achieved by developing relationships with other people, especially the opposite sex. The anorexic patient may fear separation, not being able to achieve it and thus not being able to shift her interpersonal relationship from parents to a boyfriend.

Obsessive-compulsive behavior is characteristic of anorexia nervosa. Some patients may engage in elaborate ritualistic behavior with a rigid daily routine. They are concerned with orderliness, and become upset if there are changes in the order of things that involve them. Many anorexic patients are perfectionistic. They tend to dress meticulously although they are never satisfied with their appearance.

Because anorexics are competitive, many are excellent students. They try for perfection in everything they do. They are usually preoccupied with cleanliness. Some of my patients cleaned house repeatedly daily, whether it was necessary or not. Patients may spend hours in the kitchen, not only cooking for the family, but also cleaning excessively. Such activity serves to keep the patient busy and also consumes calories.

The inability to be assertive is typical of many anorexic patients. As children they were almost always the best-behaved girls, complying with parents' demands. The eventual refusal to eat is a rather pathetic attempt to become assertive. They feel that somebody has always run their

Table 1. Differential diagnosis of anorexia nervosa

Malignancy
Tuberculosis of the gastrointestinal tract
Malabsorption syndrome such as sprue
Regional enteritis (Crohn's disease)
Hypothalamic disorder
Pituitary tumor
Sheehan's syndrome (postpartum pituitary necrosis)
Simmond's disease (panhypopituitarism)
Depressive illness
Schizophrenia
Bulimia

life. Refusal to eat conveys the message to the parents that there is one area in which they will not be controlled. Food and eating become the means of a desperate striving for independence and control. The dinner table becomes the battleground for trials of assertion against the authoritarian family and establishment. The self-denial of food becomes a symbolic weapon against the controlling parents, a weapon to win trials of gaining separation and individualization.

However, these situations also are the source of anxieties and frustrations that lead to conviction of inadequacy, ineffectiveness, and guilt. Self-denial of food and other pleasures such as rest and sexual satisfaction become the sacrifice of a rigid control over the body and what are perceived as evil natural impulses or drives.

Diagnosis

Although the disease can be easily diagnosed in the late stages (*Table 1*), there may be errors or delays in the diagnosis. The following case is a classic example of the failure to recognize the symptoms of anorexia nervosa with resulting delay in diagnosis.

Case report

A 22-year-old white woman was mildly overweight during adolescence. After her marriage at age 18, she started a crash diet at about age 19. Six months later her menstrual periods stopped, and for about two and a half years she did not menstruate. She consulted a gynecologist who did an elaborate medical work-up and gave her an injection of progesterone hoping to trigger menstruation. Another gynecologist was consulted and again an elaborate endocrinological evaluation of hypothalamic function was done; the results were negative. Another attempt by him to induce menstrual periods with hormonal therapy was unsuccessful. Therefore, his opinion was that the patient had premature menopause. After two years of amenorrhea an endocrinologist was consulted who again evaluated the endocrine system. He noted that she was depressed and suggested she see a psychiatrist. She had been under pressure by her husband and his family to become pregnant and finally came

to the psychiatric clinic. This decision was precipitated by family members who realized that she had already lost too much weight. When seen, her weight loss was not apparent; she looked well and attractively thin, like a model. There was no severe cachexia such as one might expect in anorexia. Her appearance was not suggestive of anorexia nervosa. Only close family members realized how much weight she had lost. It was evident that her menstrual periods stopped because of loss of weight. History revealed all the obsessive-compulsive characteristics of anorexia nervosa. She usually avoided eating dinner with her husband; she liked to cook but never ate with him or other family members. She became very tense, emotionally labile, and depressed.

Her consultations with the two gynecologists and endocrinologists had been part of the denial process. Unconsciously she probably knew that absence of menstruation could be due to her successful loss of weight. When anorexia nervosa was diagnosed, she was able to give up the denial and admit to the anorexic habits she had never before mentioned to a physician. She was willing and motivated to receive psychotherapy to help gain the necessary weight, have menstrual periods, and become pregnant. The motivation to become pregnant had been due to the pressure of her husband and his family to have a child. The marital relationship had already been deteriorating because of her inability to conceive.

This case demonstrates the importance of careful history-taking. Because the patient did not look too thin and in fact was attractive, anorexia nervosa was never suspected. A good history, including initial weight, could have obviated elaborate endocrinological and gynecological studies, and helped the physicians correctly diagnose the condition earlier, without hormonal therapy, which proved to be unsuccessful.

It is essential that the clinician know the diagnostic criteria of anorexia nervosa. The Diagnostic and Statistical Manual of Mental Disorders #3

of the American Psychiatric Association lists five important criteria.¹⁰ The most important of these is the intense fear of becoming obese, which does not diminish even with weight loss. The second is the distortion of body image. Patients feel fat even when severely emaciated. A weight loss of at least 25% of original body weight is diagnostic of anorexia. If the patient is under 18 years, weight loss from original body weight plus projected weight gain expected from growth charts should be added to calculate the 25% or more. Patients show persistent refusal to maintain body weight over a minimal normal weight. It is important to rule out any known physical illness that could account for the weight loss, such as malignancy or gastrointestinal tract disorder (Crohn's disease). Loss of appetite due to severe depressive illness should also be considered. In depression there is loss of appetite primarily, whereas in anorexia nervosa the appetite is good. Loss of weight in anorexia occurs regardless of the good appetite of the patient, because of the attempt of the patient to block or deny it. In schizophrenic anorexic disorders there is often a bizarre eating pattern. For example, the schizophrenic patient may stop eating to, "starve a delusional creature in the stomach." Some patients may binge eat and then vomit but not have severe weight loss. In these cases the diagnosis of bulimia may be justified. Only if weight loss in the patient with bulimia surpasses 25% of the original body weight is the diagnosis of anorexia nervosa justified. In these cases the diagnosis is both bulimia and anorexia nervosa; about half of all anorexic patients engage in occasional bingeing and vomiting.^{11,12}

Table 2. Tests for evaluation of anorexia nervosa

General physical examination
Hematologic values including hemoglobin, white blood cell count and differential white blood cell count
Hematologic values (chemistry) as SMA-18
Sedimentation rate
Quantitative stool fat
Urinalysis
Purified protein derivative test
Thyroid function tests such as T3 and T4
Cortisol, AM. and PM.
Head CT scan with contrast medium
Chest roentgenogram
Complete roentgenogram of the gastrointestinal tract including the small bowel
Electrocardiogram
Pelvic examination
Nutritional assessment

Medical work-up

Since the diagnosis of anorexia nervosa can be made from observing symptoms and signs presented by the patient, it is possible to confirm the diagnosis only by taking a good history without any laboratory tests. However, it is necessary at times to do some essential tests to rule out other pathology or physical complications due to the anorexia itself, so that the patient may be treated appropriately (*Table 2*.)

The hypothalamic-pituitary-ovarian system is usually affected in anorexia nervosa patients. There is a decreased secretion of estrogen and a defective positive feedback release of luteinizing hormone (LH) for estrogen stimulus, both at the

emaciated and weight-recovered states.^{13,14} In 10 anorexic patients seen at the Cleveland Clinic with a weight loss of 25% to 50% of the original body weight, the levels of FSH and LH were low in the severe state of the illness. Also, the vaginal mucous membrane of the vagina and cervix was hypoestrogenic, and galactorrhea was absent.¹⁵ These levels of LH are more typical in prepubertal and early pubertal patients. Frisch et al¹⁶ has estimated that a body fat content of at least 17% is required for menarche to occur. In our experience, even when body fat returned to 17% or more, resumption of normal menstrual periods occurred from one to six months later and in a few cases, even longer.

Cranial computed tomography (CT) with contrast medium is recommended to rule out the possibility of brain tumor, especially in the hypothalamic area. Occasionally, a brain scan may show mild brain atrophy in severe anorexia, which becomes normal as the patient regains a normal weight level. The significance of this finding is not clear. In a series of 27 anorectic patients at the Cleveland Clinic who had CT scans, 6 showed mild atrophy of the brain.

Roentgenographic examination of the whole gastrointestinal tract is recommended including upper gastrointestinal series, small bowel series, and barium enema examination to rule out any defect in the swallowing mechanism, ulcer, tumor, tuberculosis of the gastrointestinal tract, Crohn's disease, or malabsorption syndrome. Negative findings may reassure the patient that his or her bowel is normal, and reduce preoccupation with possible "obscure illness in the gut."

An electrocardiogram is obtained to evaluate the heart rhythm, which may be affected by the low potassium blood level. Cardiac function tests done on 12 anorexic patients at the Cleveland Clinic showed normal results. The evaluations included electrocardiograms, 24-hour Holter monitor recordings, systolic pressure response during exercise, heart rate during exercise, and echocardiograms. This study showed that the major cardiogenic risk in anorexia nervosa is loss of potassium due to vomiting or abuse of laxatives, causing severe arrhythmias, particularly ventricular fibrillation leading to cardiac arrest and death.¹⁷ Ayers et al,¹⁸ at The Cleveland Clinic Foundation, recommended skeletal evaluation in anorexic females because of the finding of significant osteopenia in 6 of 14 such patients. This raises the question of the need for replace-

Table 3. Treatment modalities for anorexia nervosa

1. Medical treatment: correcting dehydration and electrolyte imbalance
Supply of necessary nutrients by eating, nasogastric tubing or intravenous route including total parenteral nutrition (TPN)
2. Psychotherapy: Individual insight oriented (psychoanalytic)
Individual supportive
Group (general including patients with other problems)
Special group for anorexia nervosa patients
Assertiveness training group
Family therapy
Biofeedback
Hypnosis
Creative or art therapy
Recreational therapy
Behavior therapy (behavioral weight contract)
Vocational rehabilitation
Psychopharmacotherapy (medication)

ment estrogen therapy in order to prevent osteopenia.

Treatment

The treatment of anorexia nervosa is complicated because most of the patients are resistant to treatment and refuse to give up their denial. They may also be resistant to any change in their obsessive-compulsive habits; therefore, it is important that the therapist be sensitive to the needs of the patients, but resist the typical manipulative behavior of the patient. It is unlikely that one mode of treatment will be completely successful in the treatment of this disorder. It is important to tailor the treatment to the specific problem from a variety of modalities (*Table 3*). The best results are being achieved in a milieu setting of a large medical center in which a special remedial program for eating disorders is established. The therapist in charge of the treatment should work with a team in which there is complete collaboration among all team members to prevent the patient from manipulating one therapist against the other. Frequent meetings of team members are important to assess progress in therapy.¹⁹

Behavioral therapy is used only if the patient is motivated to accept the responsibilities of a behavior contract. The patient is thus able to control his or her own eating and face the contingency of the contract whenever unsuccessful. The contract enables the patient, with the help of a dietitian, to learn how much food is required

to attain and to maintain a certain weight acceptable to the patient.

Assertiveness training is part of therapy for many anorexic patients, which helps the patient with the process of separation from parents in becoming more independent.

Art or creative therapy is used to assess the progress of the patient during therapy and also to help the patient verbalize underlying conflicts by drawing and painting or working on craft projects. Since patients may deny feelings of hunger, satiety, and any other sensations of their bodies, either internal or external, biofeedback or hypnosis may help them gain awareness of their bodies and also learn to rest and take better care of their bodies, improving the distorted body image. Family therapy is an integral part of any treatment program, if the underlying conflicts are the result of faulty family relations. Recently, self-help organizations have begun to operate in several cities around the country. Patients are involved in activities of helping other patients through their local Anorexic Aid Society. This type of help is similar to that given in other self-help groups such as Alcoholics Anonymous. The growth of the Anorexic Aid Society as a self-help group is encouraging since part of their goal is to enhance the recognition of the problem by professionals and lay people so that the diagnosis can be made earlier. Usually, the sooner the diagnosis is confirmed, the better the prognosis is. Denial mechanism and obsessive-compulsive habits are not yet deeply imbedded and the patient can more easily give up the pathological eating habits if treatment is started early.

References

1. Gull W. Anorexia nervosa (apepsia hysterica, anorexia hysterica). *Trans Clin Soc London* 1874; **7**:22-31.
2. Laseque C. De l'anorexie hysterique. *Arch Gen Med* 1873; **1**:385.
3. Bruch H. *The Golden Cage: The Enigma of Anorexia Nervosa*. Cambridge, Mass: Harvard University Press, 1978.
4. Bruch H. *Eating Disorders: Obesity, Anorexia Nervosa and the Person Within*. New York: NY Basic Books, 1973.
5. Minuchin S. *Psychosomatic Families (Anorexia Nervosa in Context)* Cambridge, Mass: Harvard University Press, 1978.
6. Hsu LKG, Crisp AH, Harding B. Outcome of anorexia nervosa. *Lancet* 1979; **1**:61-65.
7. Hsu LKG. Outcome of anorexia nervosa. A review of the literature (1954-1978). *Arch Gen Psychiatry* 1980; **37**:1041-1046.
8. Bruch H. Perceptual and conceptual disturbances in anorexia nervosa. *Psychosom Med* 1962; **24**: 187-194.
9. Fries H. *Anorexia Nervosa*. New York, NY: Raven Press, 1977.
10. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 3d ed, Washington, D.C., 1980.
11. Casper RC, Eckert ED, Halmi KA, Goldberg SC, Davis JM. Bulimia. Its incidence and clinical importance in patients with anorexia nervosa. *Arch Gen Psychiatry* 1980; **37**:1030-1035.
12. Garfinkel PE, Moldofsky H, Garner DM. The heterogeneity of anorexia nervosa. Bulimia as a distinct subgroup. *Arch Gen Psychiatry* 1980; **37**:1036-1040.
13. Sherman BM, Halmi KA, Zamudio R. LH and FSH response to gonadotropin-releasing hormone in anorexia nervosa: Effect of nutritional rehabilitation. *J Clin Endocrinol Metab* 1975; **41**:135-142.
14. Wakeling A, DeSouza VA, Beardwood CJ. Assessment of the negative and positive feedback effects of administered oestrogen on gonadotrophin release in patients with anorexia nervosa. *Psychol Med* 1977; **7**:397-405.
15. Gidwani GP. Gynecological signs and symptoms in anorexia nervosa. Gross M, ed. *Anorexia Nervosa—A Comprehensive Approach*. Lexington, Mass: The Collamore Press, 1982, pp 41-44.
16. Frisch RE, McArthur JW. Menstrual cycles: Fatness as a determinant of minimum weight for height necessary for their maintenance and/or onset. *Science* 1974; **185**:949.
17. Moodie DS. Cardiac function in anorexia nervosa. Gross M, ed: *Anorexia Nervosa—A Comprehensive Approach*. Lexington, Mass: The Collamore Press, 1982, pp 45-58.
18. Ayers JWT, Gidwani GP, Schmidt IMV, Gross M. Osteopenia in hypoeostrogenic young women with anorexia nervosa. *Fertil Steril (In press)*.
19. Reece BA, Gross M. A comprehensive milieu program for treatment of anorexia nervosa. *Anorexia Nervosa—A Comprehensive approach*. Gross M, ed. Lexington, Mass: The Collamore Press, 1982, pp 103-109.