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Anorexia Nervosa: The Course of 15 Patients Treated From 20 to 30 Years Previously

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ABSTRACT

A follow-up study, after 20 to 30 years, of 15 patients with anorexia nervosa, formerly treated by the authors, revealed that only one patient failed to recover from the initial illness, and she ultimately became permanently incapacitated. Three patients have had neurotic symptoms periodically during the years following recovery, and one other became very thin in later life, but these four have been able to carry on fairly adequately for the most part. The remaining 10 patients have lived useful, well-adjusted lives, free of symptoms over the years.

This study shows that despite the apparently severe emotional disturbances reflected in the marked physical changes that take place in young people suffering from this syndrome, a deep-rooted psychoneurotic or psychotic predisposition does not necessarily exist; the majority of the patients in this series recovered and remained well after relatively simple treatment.

SOMMAIRE

Les auteurs qui avaient traité 15 malades souffrant d'anorexie nerveuse ont revu ces malades de 20 à 30 ans après. Les nouveaux examens ont révélé que seule une femme n'avait pas guéri de sa maladie et que, finalement, elle était devenue invalide en permanence. Trois malades avaient présenté périodiquement des symptômes de névrose pendant les années qui suivirent la guérison et un quatrième maigrit beaucoup plus tard. Ces malades ont pu néanmoins poursuivre leur activité de façon assez satisfaisante en général. Les 10 autres malades du groupe ont mené une vie utile et bien équilibrée, et n'ont eu aucun symptôme au long des années.

Cette étude démontre que, malgré les troubles émotifs qui se sont traduits par des changements somatiques considérables chez les jeunes gens qui présentaient ce syndrome, il n'est pas vrai qu'une prédisposition psycho-neurotique ou neurotique profonde existe nécessairement; la majorité des 15 malades étudiés ont guéri et n'ont pas eu de rechute sous l'influence d'un traitement relativement simple.

ALMOST 100 years ago, Sir William Gull[1] first adequately described the syndrome of anorexia nervosa, and gave it its name. While his description of the condition was admirable, the name is misleading since there is no true loss of appetite. The syndrome develops in adolescence, occurring mainly in females. Following some emotional disturbance, either avowed or concealed, the patients show an active, morbid or fanatical aversion to eating high caloric foods. They develop perverse habits of eating which drive their parents to distraction, and they often pretend to eat food which they throw away. In females amenorrhea is a constant finding. It usually appears early, sometimes before any weight loss. When the syndrome is well developed, the temperature tends to become subnormal, pulse and respiration slow and the blood pressure is low. When emaciation is extreme, there may be edema of the legs. The basal metabolic

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TABLE I.—CASES OF ANOREXIA NERVOSA, 1932 - 1943

Case No.	Year	Sex	Age	Height	Weight (lb.)	BP (mm. Hg)	Pulse	BMR (%)	Glucose tolerance* (mg./100 c.c.) Fasting	1/2 hr.	1 hr.	2 hr.	3 hr.
1	1932	F	15	4′ 6″	59	82/50	60-90	−37	71	82	80	64	61
2	1933	F	18	5′ 4″	70	98/70	60	−25	—	—	—	—	—
3	1933	M	21	5′ 9″	101	95/58	58-64	−25	89	97	104	67	64
4	1934	M	13	5′ 4″	75	108/70	60-70	−45	76	100	103	120	91
5	1934	F	16	5′ 5″	91	94/60	50-60	−28	68	131	156	130	142
6	1936	F	13	4′ 11″	62	—	—	—	—	—	—	—	—
7	1936	F	21	5′ 5″	77	84/60	—	−26	82	114	118	95	88
8	1937	F	23	5′ 1″	56	80/50	60-80	−30	61	63	63	66	—
9	1939	F	18	5′ 6″	88	84/60	50-70	−36	69	129	177	98	73
10	1939	F	13	5′ 4″	94	84/50	50-60	−20	100	136	123	101	87
11	1940	M	21	6′ 1″	120	102/30?	50-60	−32	85	65	62	55	—
12	1940	F	15	5′ 2½″	73	94/70	60	—	—	—	—	—	—
13	1940	F	16	4′ 10″	60	80/40	44-70	−42	64	96	63	86	83
14	1941	F	21	5′ 7″	85	98/50	60-80	−27	81	111	133	95	97
15	1943	F	16	5′ 6½″	93	96/60	70-100	−25	102	—	—	—	—

*Folin-Wu method.

rate (BMR) is lowered, as is the blood sugar. With the emaciation the patients usually remain quick, alert, active and restless and deny ill health until emaciation reaches a degree not seen in patients with organic disease who are still able to get about. If the condition is allowed to continue, it may progress to a fatal termination.

In 1938 we reported eight cases of anorexia nervosa observed during the period from 1932 to 1937.[2] In general the results of treatment were satisfactory. Since the long-term prognosis in this disease, which has its onset in adolescence, is not very well documented, it was thought worth while to make contact with these patients after many years to learn whether the improvement had been maintained. We have been able to locate seven of the eight patients. In addition we are reporting on eight other patients, treated between 1936 and 1943, whom we have been able to follow up.

The follow-up contacts were made between the years 1960 and 1964, the majority in 1963. Where it was impossible to interview a patient owing to distance, the information was obtained by correspondence. In a few instances the details of subsequent developments were obtained from the family doctor or a close relative.

The case histories of the 15 patients on whom follow-up data are available are presented in brief. The initial physical status of these patients is summarized in Table I.

CASE 1.—E.L., a 15-year-old girl, was admitted to hospital on February 11, 1962, because her mother was concerned about a loss of 16 lb. from her weight of 75 lb. five months previously. Menstruation had commenced in 1930, being regular until September 1931, when it ceased. The patient stated that she ate very small meals because of abdominal discomfort with a larger intake of food.

The patient was a small, emaciated Jewish girl, who was bright and active but very apprehensive. Her height was 4′ 6″, weight 59 lb., blood pressure (BP) 82/50 mm. Hg, pulse rate 60-90/min., temperature 96° to 99° F., and basal metabolic rate (BMR) minus 37%. Her glucose tolerance curve was flat.

Under observation she showed considerable variation in mood, but for the most part seemed cheerful and contented when her confidence was gained. She talked a great deal about her digestive system, expressing hypochondriacal ideas. She had been unhappy at home, where three older siblings would order her about, being very demanding. When she appeared ill her mother became much more solicitous, taking her part in arguments.

With reassurance and persuasion the patient began to eat ravenously. On discharge after two weeks her weight was 64½ lb. and her BMR minus 28%. During follow-up in the outpatient clinic the excessive appetite and hypochondriacal tendency continued, but by October 1932 there was a decided improvement in her mental attitude and she began eating ordinary amounts of food. Menstruation returned in November 1933 and was regular thereafter. In January 1934 she weighed 86 lb., her height was 4′ 8″, her BMR minus 5%, and her BP 112/76 mm. Hg. Mentally and emotionally she appeared normal. In 1938 she had been working in a factory for four years with good adjustment. Her older siblings had married and were living elsewhere. She weighed 104 lb.

When interviewed in 1963 she was aged 44 and her menopause had begun. She stated that she had remained well over the years, not requiring medical care. She was happily married, with two adolescent children.

CASE 2.—D.K., an 18-year-old girl, was in good health, weighing 108 lb., until September 1932, when she was sent to boarding school. There she quickly gained weight to 120 lb. Concerned about this she began to diet, with progressive loss of weight and cessation of menstruation. Her appetite remained good, but she became very anxious about epigastric fullness on eating small quantities of food, and constipation which she believed was responsible for her symptoms.

When examined on May 8, 1933, she was extremely thin. Her weight was 91 lb., height 5′ 4″, BP 98/70 mm. Hg, and her pulse rate 60/min. She was an intelligent, sensitive, conscientious girl who had studied excessively at school because of a dread of mediocre standing. Her mother suffered from paralysis agitans, which depressed and upset the patient whenever she was at home.

The patient refused to enter hospital but was seen periodically. During the next year at home her weight declined to 70 lb. In the autumn of 1934 she left home to enter university. Following this there was decided improvement. By January 1935 she weighed 100 lb. and was eating well, and menstruation had just returned. The weight gain continued, menstruation was regular, and she completed her university course, which she enjoyed very much.

In 1962 we learned from her doctor that she had married and had three children. Her married life had led to emotional problems: she had suffered three episodes of reactive depression, receiving electroconvulsive therapy (ECT) on one occasion. Since 1956 she had been well, carrying on normally.

CASE 3.—R.V., a 21-year-old man, admitted to hospital December 3, 1933, was in his usual good health, weighing 153 lb., until June 1931. He then started limiting his food intake because of epigastric fullness and nausea after eating ordinary meals. He gradually lost 52 lb. over the next 2½ years.

On examination he was an extremely emaciated young man of low-average intelligence. He was seclusive and shy but not significantly depressed, although very concerned about his health. His height was 5′ 9″, weight 101 lb., BP 95/58 mm. Hg, BMR minus 25%, and his glucose tolerance curve was low and flat.

The patient lived on a small farm with his parents and an older brother. About three years previously he was sent to a neighbouring city to live with an aunt, so that he could get employment because there was not room for him on the farm. He was unable to get steady employment, made few friends and was dissatisfied with his idle life. He disliked his aunt greatly, saying that she was a severe, petty old woman who made his life miserable. He wanted to return to the farm, but his parents would not agree. He worried about their attitude, becoming jealous of his older brother. It was in this setting that his symptoms began, with increasing curtailment of food intake.

The patient was reassured and the nature of his condition was explained to him, but he could not be persuaded to eat, so it was decided to give him duodenal feedings. He agreed to this reluctantly, with resulting gain in weight. He was soon taking nourishment by mouth in addition to the duodenal feedings, which were continued for 13 weeks. When the duodenal tube was withdrawn he was eating 3000 calories daily and enjoying his meals. At the time of discharge on March 30, 1934, he weighed 131 lb. and his BMR was minus 10%. His mental attitude was then good. He accepted reassurance about his former digestive symptoms and was looking toward the future with optimism, since it had been arranged for him to return to the family farm.

The patient was seen at infrequent intervals over the years, most recently in 1960. When his parents died he left the farm for employment in a shipyard where he has worked steadily for a long time. He has never married. His weight has varied from 135 lb. to 145 lb., except when he lost weight to 115 lb. after his father's death in 1941, but he regained his weight within the next year. Adjustment difficulties have occurred on several occasions, resulting in mild depression with somatic complaints, but he has been able to carry on adequately although tending to keep to himself.

CASE 4.—D.G., a boy aged 13, was admitted to hospital on January 24, 1934, because of weight loss and a peculiar attitude towards food. He had developed normally, living happily with his parents and one older sister, until the spring of 1933, at which time he was heavier than most of his playmates, who began calling him "tubby" and "fat". This upset him greatly, so he started dieting to lose weight with an increasing abnormal interest in food. He talked about it constantly with particular reference to the fat-producing ingredients of various dishes. His parents became alarmed at the weight loss, admonishing him to eat. He would slip food into a paper bag held between his knees during meals, afterwards burning it in the furnace. He would wipe butter off his bread and put it on the undersurface of the seat of his chair. Over a period of a year his weight decreased from 115 lb. to 79 lb. His parents stated that he had become suspicious of people. He would sneak around the house listening to conversations on the assumption that people were talking about him. He would often go into the woods alone and pray to become thin.

On examination he was extremely emaciated. His height was 5′ 4″, weight 75 lb., BMR minus 45%, BP 108/70 mm. Hg, pulse 60-70/min., and his glucose tolerance curve was low. In conversation he was bright and alert. He stated that the family, particularly his mother and sister, were "against him". He accused them of ignoring him and leaving him at home rather than taking him to places of amusement. He stated that at first he intended to stop dieting when his weight fell to 100 lb., but he found it impossible to do so.

It was ascertained that the father was an emotionally stable individual with considerable understanding, but the mother was high-strung and overly conscientious, usually failing to understand the boy's point of view. She was constantly correcting him and endeavouring to make him conform to her standards. He had always been considered a nervous child subject to impulses and full of short-lived enthusiasms for various interests. About two years previously the family moved to their present home in a different part of the city, where the patient found difficulty making new friends, spending much time by himself.

The patient's problems were discussed with him in detail. He accepted the explanation of his condition. He began eating ravenously, at times eating so much that he vomited. He gained weight progressively, eating more moderately with the passage of time. On discharge from hospital nine weeks after admission, his weight was 94 lb. and his BMR minus 29%. It was arranged that he attend boarding-school so that he would be away from the home environment. The patient did well at school, mixing with the other boys and showing no return of his former symptoms. In April 1938 his height was 5′ 11″, weight 159 lb. and BMR minus 8%.

When last contacted in 1963, it was learned that he had studied theology at the university, where he was an intercollegiate boxing champion. He became a pilot in the Royal Canadian Air Force during the war. He is now a highly successful clergyman, married with two children, and is a fine-looking, healthy, active individual.

CASE 5.—M.A., a 16-year-old girl, was admitted to hospital on September 24, 1934, complaining of

amenorrhea. Menstruation had begun at age 11 and had been essentially normal until 18 months previously when, after being scanty for two successive periods, it ceased altogether. The patient said that she felt well but she had been eating poorly and had been constipated for several years.

The patient was a bright, introspective, intelligent, co-operative but extremely emaciated girl. Her height was 5′ 5″, weight 91 lb., BP 94/60 mm. Hg, and BMR minus 28%.

It was learned that the patient weighed 135 lb. at age 11. The other children called her "fatty", which annoyed her. She became very self-conscious about her weight, which led to an increasing curtailment of her food intake. She had always been inclined to fantasy yet consistently headed her class at school. Since the age of 11 there was considerable day-dreaming, and she preferred solitude to the company of others. At various times she tried to increase her food intake, but this would result in a bloated feeling in the abdomen, which she attributed to constipation. Actually the constipation was due to faulty bowel habits with reliance on frequent laxatives. The patient had become acutely conscious, to an obsessional degree, of what other people ate. It would upset her emotionally when thin people left food on their plates or when obese people ate large amounts.

While in hospital she was optimistic and cheerful, spending much time reading books on philosophy and doing fancywork. Her constipation was quickly relieved by instruction in proper habits. Within a short time she was encouraged to take 2500 calories daily. Her mental attitude improved as her weight gradually increased. On discharge, eight weeks after admission, her weight was 102½ lb. Seen in December 1935, she was in good spirits, eating well, and weighed 119 lb. Menstruation returned in 1936 and was regular thereafter. At that time she was attending university and doing well in her studies. Her height was then 5′ 5¾″, weight 139 lb., BMR minus 17%, and BP 104/68 mm. Hg.

In 1963 it was learned that she had graduated from the university with good standing. She has been a professional writer since that time. Although nervously inclined and slender, she has remained healthy.

CASE 6.—B.M., a girl aged 13, was seen in consultation in February 1936. She was an only child with parents who were overly solicitous. She had suffered from severe poliomyelitis at age 4, with considerable residual paralysis in her lower limbs. Prior to a spinal fusion operation for scoliosis performed in 1934, she had a normal weight for her size, but shortly after the operation she became thinner, and her parents noticed she was eating inadequately. She expressed ideas about her abhorrence of being fat, although she had never been fat. Her mother tried to make her eat more but without success, the child claiming that if she ate more it made her sick. When the doctor urged her to eat more, prescribing a high caloric diet, she was found to be stealthily feeding her food to the dogs. Upon returning to school in September 1935, she weighed 77 lb. Three months later she weighed 63 lb. At that time she was taken out of school, being kept mostly in bed, but over a period of seven weeks her weight did not change. She became very nervous and irritable, unlike her former self.

On examination she was a very undernourished, strong-willed, intelligent child of small build, who was somewhat depressed. She would not enter hospital. Her height was 4′ 11″ and her weight 62 lb. She had not menstruated. There was severe residual disability in the lower limbs from poliomyelitis, but she was able to get around although with some difficulty.

With explanation and encouragement she began to eat better, gaining to 80 lb. over the next year.

It was learned from the patient in 1963 that her periods started about age 15 and were regular until they stopped at age 35. After high-school she had gone to New York to attend drama school. Subsequently she worked in radio, doing well at this type of employment. She had to discontinue her professional work in 1952 because of increasing walking difficulty related to the old poliomyelitis. She had never weighed more than 80 lb. After an unhappy love affair, she slowly lost weight to 70 lb. but has maintained this weight for years. She eats all types of food, although in small quantities, and has no peculiar eating habits. She is thin but appears to be happy and well.

CASE 7.—R.P., a 21-year-old woman, was admitted to hospital on March 31, 1936, complaining that she could not eat, was constantly tired and cried a great deal. She stated that at the age of 8 she began to get stout. At age 13 she weighed 160 lb. and was called "fatty", which bothered her greatly. Menstruation began at that time, but the periods were never regular. She became extremely conscious of her obesity, particularly her large abdomen, so she stopped swimming, which she had previously enjoyed. She commenced dieting, with progressive loss of weight. At age 16 she weighed 130 lb. At age 17 she became emotionally disturbed, because of fear that she might fail her matriculation examinations. Since then she had been subject to anxiety symptoms, existing in a state of mild, chronic ill health. Her menstruation stopped at age 19. During the year prior to admission her obsession about dieting increased so that she cut down her food intake markedly, with rapid loss of weight. It was learned that there was a family background of religious fervor, the mother being emotionally unstable and overly solicitous about the patient.

The patient was an anxious, apprehensive, timid young woman. There was marked general emaciation. Her weight was 77 lb., height 5′ 5″, BMR minus 26%, her glucose tolerance curve was flat, her BP was 84/60 mm. Hg and her pulse rate 50-80/min.

With explanation and encouragement the patient soon began to eat an adequate diet. Within two weeks her weight had increased to 81 lb., and there was a decided improvement in her mental attitude. She became bright, cheerful and interested in her progress. She requested to leave hospital on April 18, 1938, to stay with her sister-in-law. When she was seen in June 1938, the improvement had continued. Her weight then was 110 lb. She was working as a dress designer.

It was learned in 1963 that her menses returned in 1941. She was married in 1946 and had one child. She had certain marital problems which caused neurotic symptoms in 1961, but she improved under her doctor's care. Her weight in 1963 was 107 lb., at which time she was carrying on adequately, although receiving periodic support from her doctor.

CASE 8.—S.A., a young woman aged 23, was first seen on February 24, 1937. She was an only child who had enjoyed good health until 1934, at which time she weighed 112 lb. Unhappy at the university, she ate poorly, with a gradual weight loss to 94 lb. by the spring of 1936. She stated that during the preceding year the mistress of her boarding-house had spread malicious tales about her carelessness in regard to her health and refusal to eat. She felt this very keenly,

Fig. 1.—Case 8. Age 26, weight 56 lb.

refusing to admit that there was any truth in it. Her intake of food progressively declined during 1936. She began vomiting after eating, without associated nausea or discomfort. Menstruation stopped in September 1936.

On examination she was extremely emaciated but active and alert. Her weight was 69 lb., height 5′ 1″, BP 80/50 mm. Hg, pulse 60-80/min., and BMR minus 18%. Her glucose tolerance curve was incomplete but flat. She refused to enter hospital.

The patient remained at home where she was unhappy. Her condition gradually worsened, with weight loss to 56 lb. Finally, on July 19, 1939, she agreed to enter hospital, at which time she presented a picture of extreme emaciation (Fig. 1). Her BMR was minus 30%. Duodenal feeding was instituted immediately with small frequent feedings. She was bright and cheerful for the most part, with no specific complaints. Improvement was steady at first, and it became possible to give her 2500 calories daily. There were times when she became very emotionally upset, particularly when her mother was visiting her. Her mother removed her from hospital against advice on December 19, 1939, at which time the patient weighed 75 lb. and her BMR was minus 10%. Tube feeding had been discontinued three weeks previously, but she was not eating her full diet and had been seen vomiting in the bathroom on several occasions. After leaving hospital she worked in a bank, but remained very thin and tired easily.

In 1963 it was learned that she had been in the Ontario Hospital for two years with no change in her basic condition. The diagnosis was paranoid schizophrenia. She had stopped work in the bank at age 28, subsequently remaining at home, never associating with people and existing mainly on bread and milk. She expressed many delusional ideas in recent years, finally requiring certification.

CASE 9.—L.S., a girl aged 18, was admitted to hospital on March 27, 1939, because of amenorrhea and weight loss. The patient had developed normally until 1936, when she weighed 130 lb. and her height was 5′ 6″. At that time she had matriculated, having been a very good student although inclined to worry excessively about her work. She was sent to school in England and her menstrual periods, which had been regular previously, ceased. In England the patient gained weight rapidly, to 155 lb. She began to diet, with considerable weight loss, so that on her return to Canada the following summer her mother was alarmed at her appearance. During the summer she ate well, regaining a good deal of weight. She entered university in the fall of 1937, weighing 132 lb., but still not menstruating. About November she began to worry about her weight again, so that winter she avoided all fats, worked hard and lost weight to 110 lb. by May 1938. The weight loss continued until she weighed 92 lb., in spite of medical attention which included bed rest for several weeks.

On examination she was a rather shy, reserved, conscientious, introspective girl who was very sensitive to the opinion of others. When questioned about her eating habits, she protested that she ate a great deal, refusing to recognize her loss of weight and her state of emaciation. Her weight was 93½ lb., height 5′ 6″, BMR minus 36%, her sugar tolerance curve was flat, and her BP was 84/60 mm. Hg.

It was learned that the patient had been unhappy at school in England because she was lonely, found the school-work difficult, and did not seem to be doing well. She obtained some comfort from frequent eating which led to marked weight gain. This concerned her greatly because obesity was extremely repulsive to her. The girl at the school whom she disliked most was fat, very superior and self-indulgent. Her best friend at the school was a thin, quiet girl. When she began her university studies in Canada, she had a fear of again gaining weight, associating obesity with her memories of unhappiness in England, so she developed an increasing aversion to eating. She knew her mental

attitude was wrong, but said she had tried to change it without success.

In spite of persuasion and explanation the patient continued to lose weight in hospital to a low of 88 lb. Duodenal tube feedings were instituted, against which her whole being revolted, but she accepted this necessity. There was rapid improvement in weight, strength, appearance and mental attitude, so that after a couple of weeks the duodenal feedings were discontinued. Following this she ate fairly well and when discharged on July 17, 1939, she weighed 100 lb. Subsequently she continued to improve, and maintained good eating habits. Menstruation returned several months later, and her menses were regular thereafter.

In 1963 it was learned that she had remained well, was married to a professional man and had five children. She is a healthy, active person of slight build, but not considered really thin, who is artistic and attractive.

CASE 10.—M.J., a 13-year-old girl, was admitted to hospital on March 3, 1939, because her parents were alarmed about her weight loss. One year previously she had weighed 140 lb. Everyone said she was too fat, teasing her about it. She decided she should reduce, so she began eliminating high calorie foods. The weight loss was gradual, but her food restriction increased because she would have abdominal discomfort with even small amounts of food. By September 1938 she weighed 110 lb. Attempts to induce her to eat adequately failed. She was doing well in school, where she seemed well adjusted. She lived with her parents and one sister, aged 10. Both parents were stable; although her mother was rather domineering and perfectionistic, yet the household was described as a happy one.

On examination she was a bright, active, cheerful child, not at all concerned about her state of undernutrition. Her height was 5′ 4″, weight 94 lb., BP 84/50 mm. Hg, and BMR minus 20%. She had not menstruated.

Shortly after admission to hospital she was caught in the act of disposing of a meal in the toilet. She was very upset over the possibility that her mother would be told of this, but when reassured she became very co-operative and began to eat well. On discharge after five weeks she weighed 104 lb. Her improvement was steady after leaving hospital. Menstruation began a few months later.

In 1964 it was learned that the patient had remained well, and had graduated from the university. She is happily married, with four children. She has been healthy, active and athletic, maintaining a normal weight.

CASE 11.—F.O., a young man aged 21, was admitted to hospital on October 3, 1940, because of loss of 45 lb. in weight attributed to frequent vomiting 10 to 15 minutes after meals. The symptoms had started three years previously, at which time he weighed 165 lb. He stated that his appetite was good and he had no epigastric distress. The vomiting was not accompanied by nausea. He had been receiving medical treatment with no benefit.

The patient lived on a farm where he worked very hard. His father was crippled from an accident in 1938, but was still able to do some work. The patient was the oldest of four children. He stated that he had always been a worrier, but he could recall nothing upsetting at the time of the onset of his symptoms. He said his home life was a happy one, and that he liked working on the farm. He had always enjoyed good health previously.

On examination he was a nervous, apprehensive, very poorly nourished young man with intelligence in the dull-normal range. He had always stuttered to a mild degree when excited or on meeting strangers. He expressed fears that he might have a growth or something seriously wrong causing his symptoms. His height was 6′ 1″, weight 120 lb., BMR minus 32%, BP 102/30 mm. Hg, pulse 50-60/min., and his glucose tolerance curve was low and flat. A gastric series was negative and a test meal showed free acid.

With encouragement and persuasion he began to eat small, frequent meals, with progressive improvement. After three weeks the vomiting ceased altogether. He weighed 137 lb. at time of discharge on November 28, 1940, and he claimed to feel very well.

In 1962 it was learned that the patient had been regularly employed as a hired man on a farm for many years. He is a shy, retiring man who has never married, and rarely leaves the farm. His weight has been constant at about 170 lb.

CASE 12.—M.K., a 15-year-old girl, was never seen in Toronto, but one of us (R.F.F.) was consulted by correspondence in regard to her in October 1940 and subsequently, an accurate history being obtained from her doctor. She was attending a Canadian girls' boarding-school in China, where she was having a very difficult time with the female supervisor, who was extremely critical of her. One of her best friends was overweight, and was being constantly nagged by this supervisor, which the patient resented greatly. In October 1939 she weighed 112 lb. and was considered well, mentally and physically, but about November she began to reduce her intake of food. Her menstruation, previously regular, stopped in January 1940. The supervisor accused the patient of not eating simply to spite her, which added to the unhappy situation. By December she had lost considerable weight, and was sent home for a period, with some improvement, but on return to school she became progressively worse. In March 1940 a definite personality change was evident. She became withdrawn, resentful, stubborn and silent, and rarely smiled. It was observed that she would secrete food in her handkerchief, taking it from the table. In spite of marked weight loss she was tireless, and was noted to be ceaselessly running from place to place, and often walking for miles as well.

On examination the patient was extremely emaciated, restless, sullen and resentful. Her weight was 80 lb., height 5′ 2½″, and BP 94/70 mm. Hg. The skin was dry, and over the back and the limbs there was a growth of fine hair.

The patient was treated with explanation, encouragement and persuasion, but in two weeks her weight dropped to 73 lb. She was then removed permanently from the school and under the kindly influence of the doctor her condition gradually improved at home, so that she gained 17 lb. quickly, thereafter eating well.

In 1963 it was learned that improvement had continued with no relapse. She ultimately held a responsible position in a large organization until her marriage. She has two children and remains well.

CASE 13.—F.J., a girl aged 16, was admitted to hospital on January 18, 1940, because of loss of 40 lb. in weight in one year, with amenorrhea of the same duration.

The patient had lived all her life on a farm with her parents and an older sister. She quit school a year previously and had since been helping her father in the fields, and her mother in the house. Her sister had married and left home a year before, following which the patient was required to do much more work. She would arise at 6 a.m. and often would work until 8 p.m. She seldom saw anyone her own age, although previously when attending school she mixed well, enjoying the company of friends. She had a variable appetite prior to 1939, but at that time she lost interest in food and claimed that it did not appeal to her. Her menses, which commenced at age 13, stopped entirely at age 15, coincident with her weight loss.

The patient was a very emaciated girl of normal intelligence. She appeared depressed, disliked being in hospital, and would not talk freely or discuss her problems. Her weight was 60 lb., height 4′ 10″, BP 80/40 mm. Hg, pulse 44-70/min., BMR minus 42%, and her sugar tolerance curve was low and flat.

The patient was given a high calorie diet with frequent feedings. Much time was spent with her, encouraging her to eat, but it was difficult to establish good rapport. In the latter part of her two months' stay, she became more co-operative, eating much better, so that she gained up to 75 lb. on discharge.

When seen in 1963 she weighed 98 lb., which was adequate for her small stature. She said that she had continued to improve after leaving hospital, remaining well over the years. Her periods returned within a year. She is married and has one child aged 15.

CASE 14.—M.W., a young woman aged 21, was admitted to hospital on September 14, 1941, because of a loss of 25 lb. in weight since November 1940, when she weighed 130 lb. Her menstrual periods, regular until November 1940, stopped, recurring only once in January 1941. She said she felt constantly tired and was very sensitive to the cold.

It was learned that she had always been of a nervous temperament. A situation arose at school when she was 13 years of age which upset her so that she lost a great deal of weight. After being taken out of school she recovered following a long period of rest at home. She never attended school regularly after that, because she would eat poorly and lose weight. She lived with her parents and an older brother. There had always been a good deal of financial insecurity, her father being sometimes unemployed. Her mother was a nervous woman who showed a preference for the patient's brother, so that the patient felt neglected in early life. The patient was extremely fond of an aunt who lived in Montreal. She liked to visit her aunt, and was always reluctant to return home. At age 17 she got employment as a book-binder, but she did not like the work. In the summer of 1940 she met her first boy-friend, who was with the R.C.A.F., and became very much in love with him. In the autumn he was stationed in the West. They corresponded regularly and she had great plans for the future. She decided that she was getting a little fat, and that it would be best to lose some weight, so as not to disappoint her boy-friend when he returned. By Christmas 1940 she had lost 10 lb. through dieting. In January 1941 her boy-friend returned to tell her that he had become fond of another girl. After this her intake of food progressively declined and she became increasingly nervously upset. She was treated by doctors for amenorrhea and constipation, but to no avail.

The patient was a shy, sensitive, introverted girl with marked feelings of inferiority and insecurity. She was extremely thin. Her weight was 102 lb., height 5′ 7″, BMR minus 27%, BP 98/50 mm. Hg, and pulse 60-80/min.

The patient appeared to eat fairly well during eight weeks in hospital, but gained little weight. On returning home her condition deteriorated in spite of outpatient supervision, so that her weight fell to 85 lb. She had become depressed and discouraged, saying she could not bear the sight of a lot of food. On three occasions during the next two years, she was readmitted to hospital, where much time was spent with her. She received duodenal feedings on two occasions. She would gain weight in hospital, seeming much improved at the time of discharge, but would revert to her former eating habits upon returning to the home environment. A change of employment did not help, so it was finally decided in 1944 that she should go to live with her aunt in Montreal. Thereafter she made a slow, progressive recovery.

We have had intermittent contact with this patient over the years. In 1947 she weighed 120 lb. and this level was maintained subsequently. After living with her aunt for five years, she decided to go to the U.S.A., where she worked as a waitress, then trained and worked at practical nursing, enjoying it very much. She married in 1956. When last heard from in 1960, she had one child and appeared to be very well adjusted. Her menstrual periods did not return until 1954, an absence of 13 years, which is the longest period of amenorrhea to be followed by regular periods that we have seen.

CASE 15.—E.M., a 16-year-old girl, was admitted to hospital on January 12, 1943, because of marked loss of weight in the previous 18 months and amenorrhea for 15 months.

The patient lived with her parents and one younger sister, the mother being liable to neurotic symptoms. She had always been of a nervous temperament, sensitive and overly conscientious, given to worrying about her school-work and the necessity of doing well, but her previous health had always been good. In 1941 she weighed 126 lb. and was gaining weight rapidly. She became very sensitive about being overweight, particularly when her father teased her, calling her "moose". She began to diet, eliminating high calorie foods, and by Christmas 1941 she weighed 115 lb. She became increasingly irritable, being bothered by little things. By April 1942, she weighed 98 lb. Her menses, which began at age 13 and were fairly regular, stopped entirely in October 1941. At school she felt tired and everything was an effort, although she did well at the Christmas examinations. She continued to lose weight, causing her mother great concern, thus leading to her admission.

The patient was a very poorly nourished girl who was anxious and tense. Her weight was 93 lb., height

5′ 6½″, BMR minus 25%, BP 96/60 mm. Hg, and pulse rate 70-100/min.

The patient was treated with encouragement and explanation. She appreciated how her father's attitude towards her, when she was overweight, had affected her. She began to eat well, so that after four weeks she weighed 104 lb. Her recovery was uninterrupted after returning home. Menstruation returned within a few months, and was regular.

In 1963 it was learned that the patient had graduated from university, taking her M.A. She has since taught in various schools and is considered an excellent teacher. She is somewhat reserved, but has firm friends and is considered a warm person. She has enjoyed very good health over the years, having a constant, normal weight.

RESULTS

Ten of these 15 patients, followed up after many years, made good and sustained recoveries from the initial illness, including one who relapsed on three occasions over a period of two years. On each occasion this occurred when she returned home following improvement in hospital. She recovered permanently when her environment was changed after her third hospitalization. Three other patients recovered with treatment but subsequently have been liable to neurotic symptoms based on adjustment difficulties, although without return of the original illness. These three patients have been able to carry on fairly adequately in spite of their periodic symptoms. One other patient recovered after a lengthy illness, but although never actually relapsing, she became thin, but not emaciated, after an emotional upset. Menstruation, which had been regular for many years, ceased at age 35. She has remained thin but appears well adjusted. Finally there was one patient who never recovered, later becoming psychotic and now being confined to a mental hospital. There were no deaths in this series, but the mortality rate among patients with anorexia nervosa has been given as 5-10% in different series of cases.[3]

It is noteworthy that most of these patients were bright, intelligent, serious, conscientious persons. Eight later attended university, and seven of these graduated with good or excellent standings. Two others held semi-professional jobs and two more had done well at school. Two of the male patients, however, were shy, quiet, lonely youths without obvious intellectual interests.

DISCUSSION

Adolescents are liable to peculiar emotional reactions that do not seem rational to older people and may be of short duration. Their attitudes may be regarded with mild amusement by their elders, often being aggravated by teasing or attempts at correction. They are in a period of change in which many types of emotional disturbance, including strong religious feelings, may hold sway temporarily. The small group of patients with anorexia nervosa, on the other hand, acquire a more fixed attitude with an overwhelming desire to be thin, sometimes as if to inflict self-punishment in an ascetic way. This desire, amounting to a deeply seated passion, takes possession of their lives; it overrides natural appetites and comes to dominate their whole being. A curtain is drawn between them and their close associates. Unless it can be raised, a fanatical attitude may gain in strength as emaciation develops, becoming habitual. The families of those so afflicted cannot understand them, and become irritated, annoyed, and greatly concerned at what is happening. The response of anxious parents, notably mothers, aggravates the trouble. Attempts to modify the abnormal attitude by intensive psychotherapy or by psychoanalysis has usually proved ineffective and sometimes worsens the condition.[3-7] Fortunately the patients can often be helped by kindly support, calm discussion, explanation and persuasion, all entirely free from censure. Sometimes they improve spontaneously with a change from a stressful environment. When the fixation is stronger, persuasion may fail and if some method of administering nourishment, such as tube feeding, is not used, they may live in a state of chronic semi-invalidism, developing more peculiarities as they grow older—some, indeed, dying of the disorders associated with starvation. Whenever weight is gained quickly by any means, however, a striking change in their attitude usually occurs; the curtain of separation tends to rise so that it becomes possible to help them understand their trouble and do something about it.

It would be difficult to predict what persons have the inherent susceptibility to react with such singleness of purpose as is shown by these young patients. In taking their histories carefully, one finds that while the syndrome has sometimes occurred in apparently normal, healthy children, it develops most characteristically in those who are highly sensitive, usually bright, quick and intelligent, sometimes reserved, shy and lonely, not infrequently ascetic, often fanciful and artistic, but commonly rigid and capable of fixing their whole being on a single interest. It is not found in aimless, lazy, slothful or unfeeling persons. After recovery the qualities and attitudes which have been exaggerated during the illness are modified so that a more normal, healthy outlook takes precedence again.

The occurrence of amenorrhea early in the course of anorexia nervosa, and its persistence for long periods after otherwise apparent recovery, suggests that the control of menstruation in these patients is constitutionally more labile, or more vulnerable to psychological disturbance, than that of other women of their age. In four of our 12 female patients, amenorrhea occurred before there was appreciable weight loss, so it is obviously not due to undernutrition. Patients with fatal wasting diseases, such as incurable tuberculosis, commonly continue

to menstruate more or less regularly until death. Nor is the amenorrhea due to any severe pituitary insufficiency, because axillary and pubic hair persists, the breasts tending to remain full even in extremely emaciated patients. As happens also in patients with emaciation from other causes, the follicle-stimulating hormone in the urine does fall to unmeasurable amounts, but it returns more slowly than in other patients, when the lost weight is regained.

It is extremely difficult to learn what the most important precipitating factors in anorexia nervosa may be, for one cannot fathom an adolescent's mind. Abhorrence and fear of obesity loom large in the thinking of many patients. In eight of our patients the onset took place when the patient was subjected to teasing about being fat, or was simply overly conscious of obesity. One cannot accept this as the sole factor, however; otherwise anorexia nervosa would be a common and not a rare disease. It seems that there must be a background of anxiety and unhappiness from other causes, particularly environmental maladjustments, including a disturbed mother-child relationship. Our Case 9 was unhappy at a private school in England. She ate excessively for solace, becoming fat. An obese, bossy monitor was disagreeable to her. Her best friend was a wistful, thin girl. Obesity came to represent indulgence, ugliness and unpleasantness, so that over-eating appeared sinful. Other patients have described similar attitudes, with a feeling that it is good to discipline and punish oneself. It is reasonable on the other hand to think that either the previous obesity, or obesity developing as a result of anxiety and unhappiness, might determine the direction of the patient's response, the seriousness of the illness being aggravated by the influence of prolonged semistarvation and emaciation.

The most important factor in treatment is to gain the patient's confidence, which enables the doctor to help her change her attitude. Fortunately, this is often made possible by a warm, friendly attitude and by spending sufficient time to get to know her. Efforts are made to give her the feeling that the doctor is on her side trying to help her, and that he does not represent parental authority, although he wishes to help the parents also. Then by reassurance, patient explanation and firm but kindly encouragement, it is often possible to help the patients change their attitudes, so that they gradually increase their intake of food and recover. Eight of our patients responded well to this type of care. Three recovered spontaneously with environmental change. In the other four persuasion failed and increasing emaciation made it necessary to feed them through an in-lying duodenal tube. When this is done, every effort should be made to obtain the patients' consent, otherwise they regard it as punishment, which destroys the patient-doctor relationship that is all-important for ultimate success. All four of our patients who were so treated improved, with notable change in attitude after a few weeks in three; the other relapsed upon leaving hospital against advice and never made a satisfactory recovery (Case 8).

Tube feeding and other special measures to achieve greater ingestion of calories never provide complete treatment, although they may render the patient more approachable and susceptible to superficial psychotherapy. Virtually all need sympathetic understanding and support over a period of time. In some instances a change in environment is essential to recovery. In six of our patients it was considered that this was a significant factor in aiding them to get well.

This study indicates that the majority of patients with anexoria nervosa recover with relatively simple treatment, remain well and lead useful lives free of psychiatric illness. Thus the development of the disorder in a young person, despite its apparent severity, does not necessarily imply a deep-rooted psychoneurotic or psychotic tendency, although this may exist in a minority of patients as evidenced by their subsequent course.

SUMMARY

Fifteen patients with anorexia nervosa, treated between 1932 and 1943, have been followed up 20 to 30 years later. With one exception these patients all made good recoveries from their initial illness.

Ten of these patients have remained well over the years, living useful, active lives. Three patients have been liable to neurotic symptoms periodically but have been able to carry on fairly adequately with no return of the original illness. One patient, although never actually relapsing, and seemingly well adjusted, has remained very thin. One patient who never recovered, having left hospital against advice, has become psychotic and is now confined to a mental hospital.

The type of person affected, some factors influencing the development of the disease, the amenorrhea and the treatment have been briefly discussed.

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