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Skin signs in anorexia nervosa

Renata Strumia

Unit of Dermatology; University Hospital S. Anna; Ferrara, Italy

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Anorexia nervosa (AN) is a significant cause of morbidity and mortality among adolescent females and young women. AN is associated with severe medical and psychological consequences, including death, osteoporosis, growth delay, and developmental delay. Skin signs are almost always detectable in severe AN and awareness of them may help in the early diagnosis of hidden AN. Skin signs are the expression of the medical consequences of starvation, vomiting, abuse of drugs, such as laxatives and diuretics, and of the psychiatric morbidity. They include xerosis, lanugo-like body hair, telogen effluvium, carotenoderma, acne, hyperpigmentation, seborrhoeic dermatitis, acrocyanosis, perniosis, petechiae, livedo reticularis, interdigital intertrigo, paronychia, acquired striae distensae, acral coldness.

The most characteristic cutaneous sign of vomiting is Russell's sign (knuckle calluses). Symptoms due to laxative or diuretic abuse include adverse reactions by drugs. Symptoms due to psychiatric morbidity (artefacta) include the consequences of self-induced trauma. The role of the dermatologist in the management of eating disorders is to make an early diagnosis of the "hidden" signs of eating disorders in patients who tend to minimize or deny their disorder.

Introduction

The principal eating disorders are anorexia nervosa (AN), bulimia nervosa (BN), and eating disorders not otherwise specified (EDNOS). AN has two subtypes: restricting type and binge-eating/purging type. Both AN and BN are considered psychiatric disorders that have physical complications.

The hallmark of AN is a refusal to maintain body weight at or above 85 percent of expected weight, as defined by age-appropriate body mass index (BMI) charts. Patients with restricting type AN use caloric restriction or excessive exercise to lose weight. Diagnostic criteria for AN, BN and EDNOS are summarized in **Tables 1–3** and are based on the classification of eating disorders established by the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DMS IV).[1]

Several factors may play a role in the onset of eating disorders including a familial predisposition to these disorders, as well as individual personality characteristics. Predisposing factors include participation in activities that promote thinness, such as ballet dancing, modelling and athletics, fear of losing control, inflexible thinking, a tendency towards perfectionism, self-esteem which is unduly determined by the individual's view of her/his body shape and weight, dissatisfaction with body shape, and an overwhelming desire to be thin.[2]

Early diagnosis with intervention and earlier age at diagnosis are correlated with improved outcomes in patients who have eating disorders.[3]

The most severe medical complications occur in AN and can affect nearly every organ system. However, many patients may have a completely normal physical examination, especially early in the disorder.

Vital signs might be abnormal, such as bradycardia, orthostatic hypotension and hypothermia.

There can be decreased bowel motility, leading to abdominal distension. Gastroesophageal reflux and pancreatitis can cause epigastric pain. Endocrine complications include growth retardation, short stature and delayed puberty in adolescents, amenorrhea, low T_3 syndrome, partial diabetes insipidus and hypercortisolism. Moreover, osteopenia causes fractures; there is bone marrow suppression (mild anemia, leukopenia, thrombocytopenia), low sedimentation rate and impaired cell-mediated immunity.

Skin Signs in AN

Many authors reported skin signs in AN.[4-8] Cutaneous manifestations are the expression of underlying disorders, of vomiting, abuse of drugs such as laxatives and diuretics, and of the psychiatric morbidity. Gupta et al.[9] classified the cutaneous manifestations of eating disorders into four groups: those caused by starvation and/or malnutrition, those due to self-induced vomiting, findings caused by drug consumption and those caused by concomitant psychiatric illness. Based upon his data, Glorio[7] identified two groups of signs: frequent signs (xerosis, alopecia, caries, opaque and fragile hair, nail fragility) and guiding signs (hypertrichosis, Russell's sign, perimylolysis, self-induced dermatitis). Hediger et al.[8] documented that a BMI < or = 16 can be considered a critical value at which skin changes are more frequent.

Symptoms due to starvation include, in order of frequency: xerosis, lanugo-like body hair, telogen effluvium, carotenoderma, acne, hyperpigmentation, seborrhoeic dermatitis, acrocyanosis, perniosis, petechiae, livedo reticularis, interdigital intertrigo, paronychia, generalized pruritus, acquired striae distensae, slower wound healing, prurigo pigmentosa, edema, linear erythema craquelé, acral coldness, pellagra and scurvy, acrodermatitis entheropathica and miscellanea.

Correspondence to: Renata Strumia; Email: restrumi@tin.it
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Table 1. Diagnostic criteria for anorexia nervosa

(1) Inability to maintain body weight at or above a minimally normal weight for age and height (e.g., weight loss leading to body weight less than 85 percent of that expected; or failure to make expected weight gain during period of growth, leading to body weight less than 85 percent of that expected)
(2) Intense fear of gaining weight or becoming obese, even though patient is underweight
(3) Distorted perception of weight, size and body configuration
(4) Amenorrhea (i.e., the absence of at least three consecutive menstrual cycles. A woman is considered to have amenorrhea if her periods occur only following hormone administration.)
Specify type:
Restricting type: during the current episode, the patient has not regularly engaged in binge eating or purging (i.e., self-induced vomiting or the misuse of laxatives, diuretics or enemas)
Binge-eating/purging type: during the current episode, the patient has regularly engaged in binge eating or purging

Table 2. Diagnostic criteria for bulimia nervosa

(1) Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:
- In a discrete period of time (e.g., within any two-hour period), eating an amount of food that is larger than what most people would eat during a similar period of time and under similar circumstances
- A sense of lack of control over eating during the episode
(2) Recurrent inappropriate compensatory behavior in order to avoid gaining weight, e.g., self-induced vomiting; laxatives and diuretic abuse, enemas, or other medications; fasting; excessive excercise
(3) The binge eating and inappropriate compensatory behaviors both occur, on average, at least twice a week for three months
(4) Self-esteem influenced by weight administration and body shape
(5) The disturbance does not occur exclusively during episodes of anorexia nervosa
Specify type:
Purging type: during the current episode, the patient has regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics or enemas
Nonpurging type: during the current episode, the patient has used inappropriate compensatory behaviors, such as fasting or exercising excessively, but has not regularly engaged in self-induced vomiting or the use of laxatives, diuretics or enemas

Table 3. Diagnostic criteria for nonspecified eating disorder

(1) All the criteria for AN with regular menses
(2) All the criteria for AN, with normal weight
(3) All the criteria for BN, with less than two binge eating episodes per week in the last 3 months
(4) Normal body weight with inappropriate compensatory behaviour after ingestion of small amounts of food
(5) chewing and spitting repeatedly, without swallowing great amounts of food
(6) recurrent episodes of voracity, in the absence of inappropriate compensatory behaviour

From (DSM IV).[2]

Lanugo-like body hair is a frequent sign in AN, especially in younger patients. It presents as fine, downy, pigmented hairs on the back, abdomen and forearms. It is not a sign of virilization and has been associated with decreased activity of the 5-α-reductase enzyme system, probably due to hypothyroidism.

Acne may be referred to starvation, but acne itself may be a risk factor for AN. In fact, in psychologically vulnerable girls a new dieting behavior, adopted to control their acne, may lead to weight loss and AN. Moreover, the prevalence of acne is difficult to evaluate owing to the age, which naturally predisposes to the disease. Carotenoderma is due to marked ingestion of carotenoid-rich vegetables low in calories. Acrocyanosis could represent a more extreme form of heat conserving mechanism not uncommon in anorectics. Raynaud's phenomenon and perniosis have been also reported, due to endocrinological complications.

Purpura is the result of bone marrow depression from starvation and subsequent thrombocytopenia. Life-threatening episodes of thrombocytopenia are reported in the typical restricting-type of AN with purpura, gingival, nasal gastrointestinal bleeding and apparent bone marrow hypoplasia.[10]

Nail fragility, longitudinal ungueal striae, onychocryptosis, periungueal erythema have been reported.

Pellagra, scurvy, acrodermatitis enteropathica, prurigo pigmentosa, pompholyx, eruptive neurofibromatosis, evident blood vessels due to decreased subcutaneous tissue, acquired pili torti have also been reported.

The most characteristic cutaneous sign in purging type AN is the Russell's sign (knuckle calluses). The lesions involve calluses on the dorsal aspects of the dominant hand induced by the patients' repeated introduction of the hand into the mouth. It is a guiding sign in the diagnosis of eating disorders.[7]

In purging type AN patients may undergo the adverse reactions of drugs, such as laxatives, diuretics and appetite suppressants, which they use.

Self-induced trauma often coexists with AN. The disorder varies from unconscious picking at the skin to severe self-destructive actions.

Forty cutaneous signs have been recognized and new reports are expected owing to the increasing frequency of this pathology all around the world. A classification of the cutaneous signs relating to starvation, vomiting, drug abuse and psychiatric morbidity was made;[9] guiding signs for diagnosis have been identified.[7] A BMI value under which skin signs are more frequent has been established.[8]

The temporal sequence of the development of the cutaneous manifestations is difficult to establish owing to the alternating of periods of improvement and periods of relapses and to the types of AN. The resolution of skin eruptions in patients with AN almost always depends on the treatment of the underlying disorder.

Conclusions

The prognosis of AN is better if the diagnosis and therapy are timely. The role of the dermatologist in the management of eating disorders is to suspect the disease in patients who tend to minimize or deny their disorder.

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