Case Report

Anorexia nervosa

Emphasis on its medical complications

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ABSTRACT

Anorexia nervosa (AN) is a well-recognized heterogeneous psychiatric disorder, associated with high morbidity and mortality with several medical complications. Besides a brief review, this paper also reports on a single female patient with AN. Eating disorders are reported to be slightly more common among western cultures, but developing countries are not immune to eating disorders. This patient showed both the psychopathology of abnormal eating behavior and serious physical complications and despite all possible treatment interventions, she ultimately died. We discuss different aspects of AN including the importance of constant social support from key relatives.

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Bruch[1] discovered 3 areas of disordered function underpinning anorectic patients; 1. Disturbance of delusional proportions in the body image; 2. Inaccuracy of the perception or cognitive interpretation of stimuli arising in the body, and 3. A paralyzing sense of ineffectiveness, pervading all thoughts and activities. Furthermore, Russell[2] described in a seminal paper, bulimia nervosa as a variant of anorexia nervosa (AN). Anorexia nervosa, caused by biological, psychological, social and cultural factors is 10-20 times more common in females and occurs in approximately 0.3-1% of adolescent girls.[3] Russell suggested 3 diagnostic criteria for AN (a) behavior that is designed to produce marked weight loss, (b) characteristic psychopathology of morbid fear of becoming fat and, (c) evidence of endocrine disorder-amenorrhea in females and loss of sexual potency and interest in males.[4] In the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV),[5] AN is characterized as a disorder in which people refuse to maintain minimal normal weight, intensely fear gaining weight and significantly misinterpret their body and its shape plus an absence of at least 3 consecutive menstrual cycles. The DSM-IV classified AN into the restricting and the binge eating or purging types. The prognosis of AN is variably not good and several co-morbid psychiatric disorders reported in up to 50% of patients with anorexia and bulimia nervosa complicate the recovery and overall prognosis.[6] Medical complications (**Table 1**), the gravity of which is often underestimated, usually worsen the outcome of AN and their early detection and treatment may be life saving.[6] A computer Medline search of relevant literature identified 9 studies on eating disorders in the Arab world, but a huge database in the western world. Overall, these studies found usefulness of the eating attitude test (EAT-26) and the eating disorder inventory (EDI) for screening large non-Western populations for eating disorders. The main objectives of reporting

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Table 1 - Some medical complications of anorexia nervosa.

CNS	Brain atrophy, seizure, tremors, ataxia, confusion, delirium, muscular wasting and weakness
CVS	Bradycardia, hypotension, left ventricle failure, arrhythmia, and pericardial effusion
Renal	Pre-renal azotemia, electrolyte disturbances, renal insufficiency, renal failure
Blood	Anemia, leucopenia, ecchymoses, petechiae, aplastic anemia
GIT	Gastric dilatation, peptic ulcer, esophageal tears, constipation, pancreatitis, gastric rupture
Metabolic	Hypoglycemia, hypercarotenemia, increase PT and PTT, elevated liver enzymes
Endocrine	Low LH, FSH, estrogen and testosterone, decreased thyroxin and triiodothyronine, elevated cortisol and growth hormone, diabetes inspidus, and osteoporosis

CNS - central nervous system, CVS - cardiovascular system, GIT - gastrointestinal tract, PT- prothrombin time, PTT - partial prothrombin time, LH - luteinizing hormone, FSH - follicle stimulating hormone

this case of AN are to add some information to the limited data from the Arab world, to prompt other researchers in the region to report on eating disorders as these problems are apparently increasing worldwide including Arabian Gulf countries and, finally to bridge the knowledge gap among health professionals who take part in the integrated management of eating disorders.

Case Report. A 17-year-old, single, Saudi girl attended the psychiatry clinic of Buraidah Mental Health Hospital when her family members noticed substantial changes in her eating behaviors of approximately 2 months duration. The reported eating behaviors included excessive dieting, episodes of self-induced vomiting, and refusal to eat certain food items particularly meat. Her weight taken earlier at home was 35 kg. Her kith and kin tried their best to encourage her to eat and at the same time to change her attitudes towards food and body image. However, her eating pattern remained unchanged, and as a result, she continued to loose weight constantly. Her weight was only 26 kg at first consultation. In addition, the family members noticed mood fluctuations. She used to be anxious, depressed, easily provoked and often stubborn. Apparently, there were no major stresses or difficulties in her family or personal life. Initially, the patient was guarded but after sometime, she gave specific details of her problems in particular marked preoccupation with her physical well-being. Further, she reported that after knowing one of her far relative's health problem related to obesity, she became worried and anxious about her own health. Consequently, she was tremendously dieting. Another possible contributory as well as aggravating factor underlying her pathological dieting behavior was probably schoolteachers' repeated messages highlighting the dangers and complications of morbid obesity. Despite severe dieting behavior and disproportionate indulgence in physical exercise coupled with abnormal weight loss, she affirmed that she was doing the right thing and accordingly this type of dieting will help maintain her physical health. However, she never realized the dangerousness of her rapid self-induced weight loss. Indeed, she had normal childhood development including all milestones with no history of physical or emotional trauma or accident, and had excellent performance in school. She had regular menstrual cycles until a few months prior to the onset of her eating problems. Past medical history was not contributory. Likewise, no significant history of past personal psychiatric disorders was found. Family history revealed that her father died of cerebrovascular accident at the age of 80. This happened a few months before the onset of her eating disorder. Her mother is a known patient with obsessive-compulsive disorder. She was second in order among 5 siblings, 3 sisters and 2 brothers, and also had 4 step brothers and 6 step sisters from her paternal side. There were no major interpersonal problems in the family. However, the death of her father and her mother's psychiatric illness may have contributed to the patient's eating disorder. Physical examination of the patient revealed that she was remarkably thin. In addition, she had amenorrhea. However, at this stage systemic examination was within normal limits. Her personality assessment with the help of DSM-IV criteria revealed multiple traits; hardworking, perfectionist, isolated, and poor social skills. Mental status examination supported by Hamilton Rating Scale for Depression and Anxiety, Brief Psychiatric Rating Scale and DSM-IV criteria did not find any evidence of pathological anxiety, depression or any other psychiatric disorder. She was diagnosed as a case of AN. Although urgency for admission was discussed and considered, first a trial to manage her on outpatient basis was attempted. The treatment plan included cognitive behavioral therapy, focus on encouraging intake of adequate food, protein supplementation and no exercise at all. In addition,

she was prescribed mirtazapine, 15 mg daily. Her elder sister was extremely concerned about her condition and acted as a co-therapist as well as a facilitator of treatment plan at home. Subsequently, after 2 outpatient visits, her condition did not improve rather her physical status further deteriorated considerably. Hence, outpatient treatment together with intensive social support offered by her sister and other siblings did not work even minimally. She was admitted to the medical ward of a specialist hospital in April 2003 for further assessment, investigation and treatment. Physical examination showed a skinny, young girl with emaciation. Furthermore, she was mildly edematous, looked pale but no organomegaly was found. Her other body systems were within normal limits and her physical appearance was smaller than to her stated age. A battery of laboratory investigations plus electrocardiogram and a chest x-ray was within normal limits. Her weight was 26.5 kg with a body mass index (BMI) of 9. Mental status examination revealed that she was properly dressed, fully conscious and attentive, oriented to time, place and person, reactive mood, no psychotic features and judgment was impaired. During her short hospital stay, she was given supportive treatment including dextrose with multivitamin supplements, iron, folic acid, calcium, vitamin C, high protein, and calorie diet. A dietician comprehensively assessed her nutritional status. She was closely supervised and observed her eating behavior, any exercise or induced vomiting or any use of laxatives. She was also subjected to daily intensive psychotherapy sessions, in which she was freely encouraged to divulge her multiple conflicts including about body image. Initially, she was resistant but subsequently she accepted to eat adequately. Both she and her family ask for discharge after 5 days of admission with a promise that she will continue the same treatment regimen at home. She along with her family members was informed about the grave consequences of rapid weight loss. She was discharged with follow-up appointments in the psychiatric clinic and internal medicine. She was prescribed multivitamins and calcium only. Unfortunately, she did not show up for her appointments until she was referred as an emergency case from a peripheral hospital. In the Emergency Department, it was noticed that she was unable to walk with marked generalized weakness, cold peripheries, and was almost bedridden with further significant weight loss. At this stage, she was 16 kg with several complications. Notably, one of the main reasons for her rapid deterioration was a lack of family support as her main caretaker, her elder sister with end-stage renal disease was on a foreign trip for 2 months for renal transplant. During her absence from the scenario, other family members simply ignored her and decided to leave her to do what she wanted. Consequently, she developed further weight loss coupled with marked worsening in her overall functioning. She was admitted to the medical ward after being given basic emergency measures. During her hospital stay, she passed through a complicated course. She was reported to have severe dysphagia, bed sores, oral thrush, and fever with cough. She was reviewed by a consultant gastroenterologist and pneumologist who advised several investigations including CT of chest, which revealed bilateral lower lobe consolidation with pleural effusion (**Figure 1**). A CT of abdomen showed silent renal cyst. Additionally, her liver function tests were impaired and prothrombin time was prolonged. Despite serious complications, she continued to refuse to take regular diet. Therefore, the treating team decided to insert nasogastric tube (NGT). She was managed as a case of severe AN with several revealed complications; hypoglycemia, hypokalemia, hypophosphatemia, hypomagnesemia, hypoalbuminemia, hypocalcemia, anemia, thrombo-cytopenia, metabolic acidosis, liver impairment with prolonged prothrombin time, and deranged liver functions, and bilateral subcutaneous emphysema. Chest infection resulted in septicemia, shock, and disseminated intravascular coagulopathy. She was given appropriate intravenous fluids, electrolytes (potassium chloride), calcium supplement, sodium, and intravenous antibiotics. Despite intensive management, her condition worsened further with ecchymosed face and purpurea all over the body within 8 days of admission. Subsequently, she developed left sided hemiplegia with myoclonic jerks and an urgent CT brain showed extensive right cerebellar infarction (**Figure 2**) and cerebral atrophy. On day 8, she rapidly deteriorated with desaturation and hypotension. She was shifted immediately to the medical intensive care unit where she was intubated. She was reported to develop supraventricular tachycardia, which was effectively treated with intravenous amiodarone. Besides continuing NGT feeding, she also received packed red blood cells, platelets, fresh frozen plasma (FFP) and appropriate antibiotic cover. The next day, a battery of other investigations, carried out for ruling out any super added infections and systemic diseases including systemic lupus erythematosus, acquired immuno- deficiency syndrome, CSF Venereal Disease Research Laboratory (VDRL) reactivity, brucellosis, and salmonella, was negative. After a few days, she developed flaccid quadriplegia with absent reflexes. She was reviewed by a consultant neurologist who entertained the diagnosis of a polyneuropathy attributable to critical illness. A bone marrow study was suggestive of aplastic bone marrow. Bronchoscopy with bronchoalveolar lavage (BAL) cells analysis was non-contributory and similarly upper endoscopy was normal. Chest x-ray

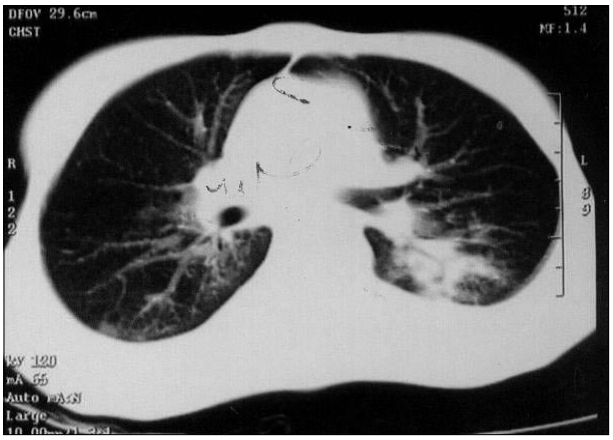

Figure 1 - Computer tomography of chest showing bilateral lobe consolidation with effusion.

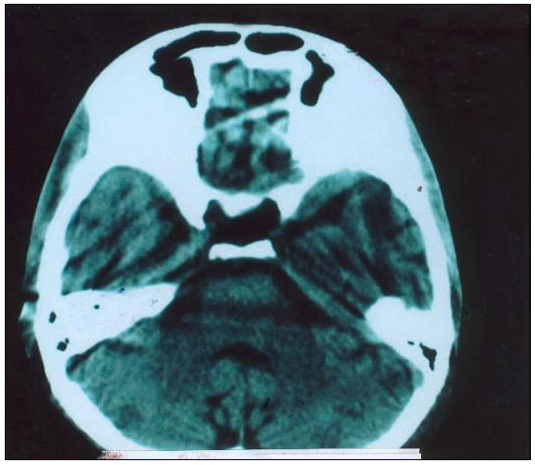

Figure 2 - Computer tomography of brain showing right cerebellar infarction.

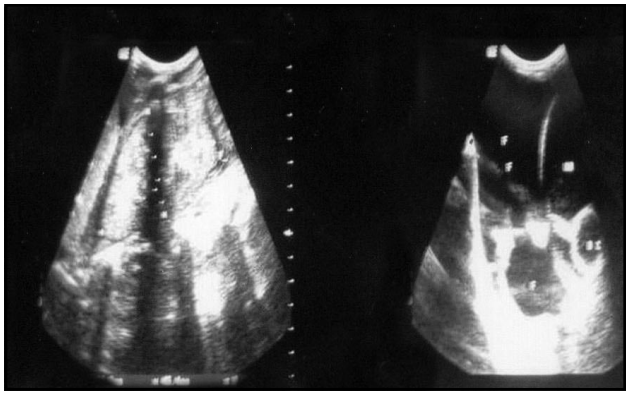

Figure 3 - Ultrasound of abdomen showing free fluid.

revealed pneumonia. A CT, both of chest and abdomen, revealed bilateral persistent consolidation with effusion, bronchiectasis and ascites with dilated fluid filled small bowl loops. Ultrasound of abdomen showed free fluids **(Figure 3)**. Repeated urine culture and sensitivity showed growth of *Candida albicana*. She was given an injection of imipenem/cilastatin (Tienam), 500 mg twice daily, fluconazole and an injection of amphotericin for bladder irrigation in addition to other supportive measures. In view of her critical condition, a board of physicians including the treating physician recommended that this young girl must be referred to higher medical center for further evaluation and management as multiple body systems were adversely involved. However, the response from the tertiary medical center was negative. Over the next few days, her condition deteriorated rapidly and progressed to frank acute renal failure with positive disseminated intravascular coagulation profile. She was ventilated. On day 35, she began to gasp coupled with desaturation and hypotension. Cardiopulmonary resuscitation attempt lasting one hour failed, and she was declared dead.

Discussion. This patient met diagnostic criteria of AN proposed both by major psychiatric classifications.[5,7] Evidently, this young girl intensively engaged herself in specific behaviors and activities to lose weight. Furthermore, her 26 kg weight was much lower than her ideal weight, though she believed that she was obese with intense fear of becoming fat. Reportedly, prior to her abnormal attitudes towards food and body, she did not suffer from any physical and other psychiatric diseases that might affect her appetite and cause her weight loss and vomiting. This patient was also resistant to any therapeutic manipulations by her social supports and physicians who used various cultural means to bring about positive and meaningful alterations in her negative eating behaviors. Her persistent preoccupation's with body image ruled out the possibility of pervasive refusal syndrome.[8] Although AN was thought to be a culture-bound syndrome,[9] trans-cultural studies suggest an opposite view attributed to rapid cultural transition across international boundaries and moreover similar prevalence of AN has been projected globally. The management of AN, and its medical complications need to be dealt by a multidisciplinary team. Initially, cognitive behavioral therapy was tried on short-term basis with some but transient improvement in her condition. Upon the request of her family, premature discharge and a lack of follow-up probably precipitated her condition. For better outcome, the patient and family members need to be engaged in psychotherapy. Provided multiple

socio-cultural constraints, psychoeducation were used and most relevant issues were discussed and explored. In addition, physicians and nutritionist offered relevant nutritional materials and discussed with this patient the essential role of nutrition in basic body biological activities. An exploration of distorted self-image and body shape elicited negative thoughts, which were altered partly. Further, significance of self-assertiveness with confidence was suggested to her. Negative reinforcement was also used to control her excessive exercise and induced vomiting. Habit control of reversal techniques was also used with partial improvement. During follow-up, negative thoughts related to abnormal eating behavior were also addressed. The revealed styles of cognition such as over generalization, catastrophizing, dichotomous thinking and over reliance on others' opinion as elicited in this patient were also discussed.[10,11]

Rapid deterioration evident in this patient was due both to lack of social support and effective family relationships, which were the main reasons for her poor follow-up. Ultimately, she showed up too late in a very critical condition together with shattered psychological framework. In addition, this patient had some other complicating factors including pre-morbid obsessive personality traits and maternal history of obsessive compulsive disorder. Progressively, this girl developed severe and rapidly deteriorating AN coupled with multiple serious medical complications that collectively led to her death. The mortality rate of 2-5% is reported in AN. Early detection of AN, together with the treatment of its medical complications are life saving.[12] Fenley et al[13] reported a protracted case of AN that remained in the medical system with numerous admissions and work-ups over 3 decades before its correct diagnosis was made. This suggests that both mental health professionals and medical staff must keep themselves abreast of AN. As corroborated by this case, physicians reluctantly accept the diagnosis of AN. They also try to underplay its severity and impending serious complications. Patients with AN often lack insight into these complications and refuse early intervention. Two main causes of medical complications are identified in the literature;[14] direct ones are attributed to self-starvation and malnutrition impacting adversely essential biological metabolism and indirect ones related to induced vomiting, laxative or diuretic abuse, binge eating, self-destructive behaviors, and co-morbid psychiatric disorders. At the second admission, she presented with several complications including hypovolemic shock attributable to hypoproteinemia with massive edema and cardiac decompensation. Cardiovascular complications, usually noticed in the first 2 weeks are the most common and frequent causes of fatalities in patients with vomiting, purging or diuretics abuse. Furthermore, there are multiple acute medical emergencies associated with AN. Osteoporosis, an early and perhaps irreversible consequence of severe weight loss, results from deficiencies of estrogen, calcium, and excessive glucocorticoids, which might lead to pathological fractures. Therefore, physicians should take seriously bone or back pain of patients with eating disorders. A patients with AN who develop amenorrhea during adolescence are at the greatest risk for osteoporosis. Approximately 30-50% of cases of AN develop hematological changes such as pancytopenia, bone marrow hypoplasia and decrease in platelets coupled with increased bruises. Vitamin K–deficiency contributes to abnormal coagulation as evidenced in this patient. Approximately 70% of patients show several renal abnormalities.[15]

Finally, due to this case and brief review, some important points are highlighted: AN may present with more medical conditions and complications than psychiatric problems; this condition needs early detection and management by a multidisciplinary team; a psychiatrist can not engage medically complicated patients in resolving essential psychopathology; and it is mandatory for team members to keep up-to-date with the latest clinical and research developments in eating disorders.

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