Medical Complications of an Eating Disorder and Management

Dr. Tom Scales, MD
Attending Psychiatrist/Physician
Odyssey Behavioral Health
Interprofessional Continuing Education

1. I have no relevant financial relationships with any ACCME-defined commercial interest to disclose.

2. I will not discuss off label use and/or investigational use in my presentation

3. All Ascension planners, reviewers, and course directors have no relevant financial relationships with ACCME-defined commercial interests

*a commercial interest is any entity producing marketing, re-selling or distributed health care good and services consumed by or used on patients.
Anorexia Nervosa is a Life-threatening Disorder

• 10-year mortality rate of 5.6 percent
  • 27% suicide
  • 54% from direct effect of their illness, usually cardiac
  • 19% unknown

• Mortality rate is 12 times higher than that of 15- to 24-year-old females in the general population
Symptoms Found in Patients with Eating Disorders

• Anorexia Nervosa
  • weight loss
  • amenorrhea
  • irritability
  • sleep disturbances
  • fatigue
  • weakness
  • headaches
  • dizziness
  • constipation
  • feeling of fullness

• Bulimia Nervosa
  • irregular menses
  • esophageal burning
  • nonfocal abdominal pain
  • fatigue
  • swelling of hands/feet
  • frequent sore throats
  • swollen cheeks
  • headaches
  • constipation/diarrhea
Signs Present in Patients with Eating Disorders

• Anorexia Nervosa
  • emaciation
  • cyanotic hands
  • bradycardia
  • hypotension
  • dry skin
  • brittle hair
  • hair loss on scalp
  • yellow skin
  • lanugo hair
  • edema in ankles

• Bulimia Nervosa
  • calluses on the back of the hand
  • salivary gland hypertrophy
  • erosion of dental enamel
  • periodontal disease
  • perioral irritation
  • hematemesis
  • abdominal bloating
Laboratory Results that Might Point to a Diagnosis of Eating Disorder

- **Anorexia Nervosa**
  - Hypercholesterolemia
  - QT prolongation on EKG
  - Low white blood cell count
  - Low LH, FSH, estradiol, or testosterone

- **Bulimia Nervosa**
  - Hyperamylasemia
  - Hypokalemia
  - Metabolic alkalosis
Avoidant/Restrictive Food Intake Disorder

• An eating or feeding disturbance as manifested by persistent failure to meet appropriate nutritional and/or energy needs associated with one or more of the following:
  • significant weight loss
  • significant nutritional deficiency
  • dependence on enteral feeding or oral nutritional supplements
  • marked interference with psychological functioning

• The disturbance is not better explained by lack of available food or by an associated culturally sanctioned practice

• The eating disturbance does not occur exclusively during the course of anorexia nervosa or bulimia nervosa, and there is no evidence of a disturbance in the way in which one’s body weight or shape is experienced

• The eating disturbance is not attributable to a concurrent medical condition or not better explained by another mental disorder
Anorexia Nervosa

• Restriction of energy intake relative to requirements, leading to a significantly low body weight in the context of age, sex, developmental trajectory, and physical health

• Intensive fear of gaining weight or of becoming fat, or persistent behavior that interferes with weight gain, even though at a significantly low weight

• Disturbance in the way in which one’s body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or persistent lack of recognition of the seriousness of the current low body weight
Bulimia Nervosa

- Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:
  - eating, in a discrete period of time an amount of food that is larger than what most individuals would eat in a similar period of time under similar circumstances
  - a sense of lack of control overeating
- Recurrent inappropriate compensatory behaviors in order to prevent weight gain, such as self-induced vomiting; misuse of laxatives, diuretics, or other medications; fasting; or excessive exercise
- The binge eating and inappropriate compensatory behaviors both occur, on average, at least once a week for 3 months
- Self-evaluation is unduly influenced by body shape and weight
- The disturbance does not occur exclusively during episodes of anorexia nervosa.
Binge-Eating Disorder

• Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:
  • eating, in a discrete period of time an amount of food that is definitely larger than what most individuals would eat in a similar period of time under similar circumstances
  • a sense of lack of control overeating

• The binge-eating episodes are associated with 3 or more of the following:
  • eating much more rapidly than normal
  • eating until feeling uncomfortably full
  • eating large amounts of food when not feeling physically hungry
  • eating alone because of feeling embarrassed by how much one is eating
  • feeling disgusted or guilty
Binge-Eating Disorder

- Marked distress regarding binge eating is present
- The binge eating occurs, on average, at least once a week for 3 months
- The binge eating is not associated with the recurrent use of Inappropriate compensatory behavior as in bulimia nervosa and does not occur exclusively during the course of bulimia nervosa or anorexia nervosa
Differential Diagnosis for Anorexia Nervosa

- Hyperthyroidism
- Addison disease
- Diabetes mellitus
- Malignancies
- Chronic infections, e.g., TB, AIDS, fungal diseases
- Hypothalamic lesion or tumor
- Cystic fibrosis

- Superior mesenteric artery syndrome
- Malabsorption syndromes
- Inflammatory bowel disease
- Parasitic intestinal infections
- Chronic pancreatitis
- Other psychiatric d/o
Differential Diagnoses for Bulimia Nervosa

• Scleroderma or other connective tissue diseases
• Inflammatory bowel disease
• Peptic ulcer disease
• Parasitic intestinal infections
• Chronic pancreatitis
• Superior mesenteric artery Hypothalamic lesions or tumors
• Zenker diverticulum
Differential Diagnosis for Binge Eating Disorder

• Kleine-Levine Syndrome
• Prader-Willi Syndrome
• Temporal lobe seizures
• Lesions of the hypothalamus, frontal lobe, or temporal lobe
  • Kluver-Bucy

• Degenerative neurological conditions
  • Pick disease
  • Alzheimer disease
  • Huntington disease
  • Parkinson disease
Medical History Taking

- Weight history
- Diet history
- Use of diuretics, laxatives, diet pills, Ipecac, thyroid medications
- Menstrual history
Physical Examination

- Weight and height
- Pulse and blood pressure (orthostatics)
- State of hydration
- Dental examination
- Cardiac examination (EKG)
- Abdominal exam
- Neurological exam
- Gynecological exam
Recommended Laboratory Tests

- CBC with differential
- Serum electrolytes
- Calcium, magnesium, phosphorus levels
- Liver function tests
- BUN, creatinine levels
- Blood glucose levels
- Free T4 and TSH levels
- Urinalysis
- Stool examination if GI bleeding
Other Recommended Diagnostic Test

• DEXA scan
  • for all women with history of 6 months or more of anorexia nervosa
Criteria for Hospitalization for Anorexia Nervosa

- Weight less than 70% of expected IBW
- Continued weight loss despite intensive outpatient therapy
- Unstable vital signs: pulse < 40, temp < 35 C, SBP < 80 mmHg
- Arrhythmias
- Suicidality
Criteria for Hospitalization for Bulimia Nervosa

• Potassium less than 2.4 mmol/L
• Bicarbonate > 38 mmol/L
• Excessive edema, history of edema with cessation of purging behaviors, severe constipation despite laxatives
Metabolic Abnormalities in Patients with Eating Disorders

- Of 168 patients with bulimic eating disorders
  - 50% had electrolyte abnormalities
  - Elevated serum bicarbonate 27.4%
  - Hypochloremia 23.8%
  - Hypokalemia 13.7%
  - Decreased serum bicarbonate 8.3%
  - Hyponatremia 5.4%
  - Hypomagnesemia in those who abuse diuretics
Metabolic Abnormalities in Anorexia Nervosa

• Study of 42 patients
  • All electrolytes were normal in all 42 patients except one who engaged in vomiting
• 40% did have azotemia
Clinical Manifestations of Metabolic Abnormalities

- Weakness
- Constipation
- Dizziness
- Cardiac arrhythmias and sudden death
- Tetany with hypomagnesemia
Refeeding Syndrome

• Anorexia Nervosa
  - Among male study volunteers who lost 25% of initial body weight during 6 month semistarvation diet
    • Bradycardia
    • Systolic hypotension
    • Decrease in stroke volume
    • Decrease in heart size
    • Decrease in oxygen demand

• 5 Month Refeeding
  • Marked increase in metabolic rate
  • Recovery of cardiac stroke volume lagged behind the recovery of intravascular volume
  • Some subjects developed congestive heart failure during refeeding
Refeeding Syndrome

• Reduced heart mass and increases in total circulatory blood volume can result in heart failure
• Diminished cardiac output as a result of heart muscle atrophy that accompanies unhealthy weight loss
• Low levels of phosphorus, potassium and magnesium
• Hypophosphatemia develops during refeeding mainly due to the glucose content of the food
• Glucose load increases insulin release, which in turn drives phosphorus and potassium into intercellular space
• Low serum phosphorus levels are accompanied by depletion of ATP, which impairs the contractile properties of the heart and can evolve into congestive heart failure
• Hypophosphatemia can also result in diaphragmatic muscle fatigue and respiratory failure
Consequences of Hypophosphatemia

• RBC dysfunction (hemolysis)
• Rhabdomyolysis
• CNS dysfunction (seizures)
• Myocardial failure
• Respiratory paralysis (diaphragm doesn’t move)
• How to replete phosphorus
  • 500 to 1000 mg potassium phosphate (Kphos) by mouth daily to four times daily
Recommendations to Avoid Refeeding Syndrome

• Recognize the patient at risk— the lower the BMI, the higher the risk, has not eaten for 7 days, those chronically malnourished

• Carefully test for the electrolytes abnormalities before initiating any nutritional support whether PO, NG, or TPN and correct them

• Restore circulatory volume, closely monitor vitals and exam, Never administer rapid IV fluids

• Begin caloric intake of 1400 to 1800 kilocalories per day or 30 to 45 kcal/kg/day

• Increase caloric delivery slowly, by 300 to 400 kcal every 3 to 4 days until the level of caloric intake is sufficient to produce adequate weight restoration.

• Carefully monitor the electrolytes especially over the first week, including phosphorus, potassium and magnesium
Cardiovascular Complications and Management

• Clinical Signs of Anorexia Nervosa
  • Bradycardia
  • Relative hypotension
  • Orthostatic hypotension
  • Tachycardia with minimal exertion
  • Pericardial effusions
  • Increased QT dispersion on EKG
  • Ectopic rhythms
  • Mitral valve prolapse
  • Fibrosis by MRI

• Clinical Signs of Anorexia Nervosa
  • Diminished exercise capacity
  • Cold extremities
  • Small heart by palpation
  • Mid-systolic click
  • Painful calves
  • Heart failure worsened by refeeding
Cardiac Abnormalities

• QT interval prolongation leading to torsades de points, leading to life threatening ventricular arrhythmia. Sudden death in anorexia nervosa?
• QT prolongation due to electrolyte abnormalities or effects of medication such as antipsychotics or macrolide antibiotics, not intrinsic to anorexia nervosa
• The risk of torsades de points increases significantly when QTc is > 500 msec
• QT dispersion, a risk factor for increased risk for arrhythmias. Normally the length of the QT interval is similar in each of the 12 leads. QT Dispersion refers to the difference between the maximum QT interval and the minimum QT interval occurring in any of the 12 leads. It is a risk for serious ventricular arrhythmias
Cardiovascular Complications and Management

- Cellular changes with anorexia nervosa
  - Myocardial fibrosis and scarring
  - May correlate with malignant arrhythmias and may potentially account for the heightened risk of sudden death

- Structural abnormalities
  - Ventricular wall muscle atrophy
  - Reduced left ventricular mass index
  - Reduction in chamber dimensions
  - Can lead to annular laxity in subsequent mitral valve prolapse
  - May adversely affect both cardiac performance and remodeling
Risk Factors for Cardiac Complications in Anorexia

• Duration, degree and rapidity of weight loss
  • rapid weight loss due to purging behaviors, laxative use or diuretic use leads to acute electrolyte abnormalities
  • the more severe weight loss (>25% IBW), the greater the decrease in cardiac size

• Type, duration, and extent of various purging behaviors
  • greatest risk to lowest: self-induced vomiting, enema abuse, laxative abuse, diuretic abuse
  • frequency of purging behaviors-- hypokalemia
Risk Factors for Cardiac Complications in Anorexia

• Syrup of Ipecac
  • Emetine causes cardiomyopathy
  • Remains in the body for prolonged periods of time with chronic use
  • Heart must be exposed to 1,250 mg of emetine over period of a few months to be at risk for cardiomyopathy
  • Exact mechanism of ipecac induced cardiomyopathy is not known
Risk Factors for Cardiac Complications in Anorexia

- Severe and/or rapid weight loss
- Purge frequency
- Ipecac use
- Comorbid physiological disorder
  - diabetes mellitus
  - inflammatory bowel disease
- Older age or underlying cardiac disease
Hospitalization for Cardiac Complications

• Low potassium levels
• Low magnesium levels
• Low phosphorus levels
• Prolonged QT intervals - early phases of weight restoration
• Heart rate below 30
• Hypotension that results in symptoms of fainting
• Presence of any other significant arrhythmia
Exercise Contra-Indications for Those with Anorexia Nervosa

- Electrolyte abnormalities
- Prolonged QT interval
- Any significant arrhythmia
- Chest pain
- Lightheadedness
- Shortness of breath

- Nonaerobic floor exercises for 10 to 20 minutes daily permitted when all above has resolved
- Exercise can be allowed if patient is able to modulate intensity once patient is within 10-15% IBW
Cardiovascular Complications and Management

- Bradycardia
  - Atropine is contraindicated
- Medications that increase the QT interval should be used with caution
  - T.C.A.
  - Fluvoxamine
  - Nefazodone
  - Cisapride
Conclusion and Questions

Tom Scales, MD
tcales@odysseybh.com
Attending Psychiatrist/Physician
Odyssey Behavioral Health

Kayla Carson, RDN, CSSD
kaylac@selahhouse.com
Senior Regional Director of Clinical Partnerships, Southeast
Selah Eating Disorder Network