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ADOLESCENT HEALTH

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Focus:

Adolescent Health

Caring for Individuals with An Bulimia Nervosa in the Primar

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Primary Care Physicians (PCPs) are at the front line for the initial diagnosis of those with mental health disorders in their patients. A total of 13-20% of children and adolescents living in the United States experience a mental disorder in a given year.[1] Eating Disorders (EDs) are serious psychiatric illnesses that can lead to very severe medical complications and even death if left untreated. Often many practitioners are hesitant to treat eating disorders due to their high mortality rates. This article seeks to demystify the treatment and aide in providers feeling more comfortable and confident treating these disorders by recommending practical guidelines on the diagnosis, associated medical complications, appropriate medical monitoring, and advice for referrals to various levels of care for patients with Anorexia Nervosa (AN) and Bulimia Nervosa (BN).

Case Report:

Frannie, a 14-year-old girl comes to her PCP for her annual back to school physical exam. Her parents tell the doctor they are worried because their daughter has been complaining about stomachaches intermittently throughout the summer and not been eating much with them at meal times. They also report that she has not been going to the beach with friends and instead has spent most of the summer taking their dogs on long walks. Frannie reports that she feels constantly bloated and eating just makes it worse. Upon further questioning she reports that she hasn't wanted to go to the beach because she is embarrassed to look so fat in a swimsuit with her friends. She reports that she has been going on long runs to try and help her lose a little weight before school starts. On exam Frannie is a thin appearing 5-foot tall girl weighing 88 lbs (12th percentile), which is a decrease from last years exam where she weighed 115 lbs (75th percentile). BP is 92/70 and HR is 44. She appears pale with thinning hair. She is withdrawn with limited eye contact for most of the interview. She states that she has been feeling depressed for the past year and within the past couple months has thought about not wanting to live anymore but has not thought specifically about a plan.

DSM -5 Diagnostic Criteria: The prevalence of AN in young woman is 0.5% while BN affects 1-5% of young women.[1] Overall 5-10% of EDs occur in males and while eating disorders are being seen in increasingly younger ages, children under 12 years of age represent only 4% of the total hospital admissions for EDs.[1,2] While previously thought of as a Caucasian, middle or upper middle class illness, we now know eating disorders occur amongst all ages, races, socioeconomic class, as well as in both industrialized and non-industrialized societies.[4]

orexia Nervosa and y Care Setting

The Diagnostic and Statistic Manual-5 (DSM-5) is the accepted diagnostic system for both children and adults. Modifications of criteria from DSM-IV aimed to widen criteria for AN and BN to be more inclusive in hopes of leading to earlier recognition and treatment for these disorders. AN is characterized as an intentional restriction of calories causing a significantly low body weight, a fear of gaining weight, and a disturbed body image. BN is characterized as recurrent episodes of binge eating followed by compensatory behaviors to avoid gaining weight. Refer to tables 1 and 2 for diagnostic criteria.

Medical Complications of Eating disorders: When a discrepancy between energy intake and need exists, a hypometabolic state is created and is responsible for many of the symptoms and complications seen in EDs.[4] The following complications are those most commonly seen in both restrictive and binging and purging eating disorders:

Electrolyte Disturbances and Cardiovascular Abnormalities

In patients with BN it is especially important to check electrolytes. Vomiting or chronic laxative abuse can cause a hypochloremic, hypokalemic metabolic alkalosis, which can cause cardiac arrhythmia and sudden death. Of note, acute laxative use can often cause a metabolic acidosis. When following electrolyte levels in patients with BN, with vomiting one typically sees CO2 rise first, followed by a decrease in Cl- second, and a decrease in K+ last. Generally hypokalemia is taken very seriously as it is the most common medical cause of mortality in patients with ED due to arrhythmias. As such, admission to the hospital is recommended when potassium levels are lesser than or equal to 3.0 mmol/L.[4]

In those with AN electrolyte disturbances are more rare, and when they do occur tend to not be due to malnutrition but instead fluid manipulation. This can be seen as hypernatremia caused by patients limiting their fluid intake to appear as thin as possible or hyponatremia because of water loading done to either help suppress their appetite or done to add pounds for scale checks. Hyponatremia should be viewed as the more dangerous due to its association with seizures that can even result in coma.[4]

Cardiovascular changes are also associated with AN and BN. Malnutrition can lead to myocardial atrophy and decreased cardiac output. In addition to this the bradycardia and orthostatic hypotension associated with AN are considered evidence of cardiovascular instability due to hypometabolism and increased vagal tone.[5] This is an important factor to consider when rehydrating an ED patient, as aggressive hydration should be avoided since it may lead to fluid overload, edema, and CHF.

Electrolyte and cardiovascular abnormalities must also be considered as a complication of treatment itself. Refeeding syndrome is a potentially lethal condition that can be defined as severe electrolyte and fluid shifts associated with metabolic abnormalities in malnourished patients undergoing refeeding, which can lead to cardiac and respiratory failure.[6] Clinical features include fluid balance abnormalities, abnormal

Table 1: DSM 5 Diagnostic Criteria for Anorexia Nervosa

Criterion A: Intentional restriction of calories, leading to a significantly low body weight	
Criterion B: Intense fear of gaining weight or of becoming fat	
Criterion C: Disturbance in self perceived weight or shape, strong association with self worth, or lack of recognition of the seriousness of the current low body weight	
Anorexia Nervosa Subtypes	
Restricting Type	***Binge Eating/Purging Type***
During the past 3 months no purging behaviors (vomiting, laxatives, diuretics, enemas, etc)	During past three months they have engaged in purging behaviors
Weight loss accomplished through dieting, fasting, and/or intense exercise	
Severity Scale	
Mild: BMI ≥ 17 kg/m^2 Moderate: BMI 16–16.99 kg/m^2 Severe: BMI 15–15.99 kg/m^2 Extreme: BMI < 15 kg/m^2	

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Table 2: DSM 5 Criteria for Bulimia Nervosa
Recurrent episodes of binge eating. Binge eating characterized by: • Eating, in a discrete period of time, an amount of food that is larger than what most individuals would eat in similar circumstances • A sense of lack of control over eating during the episode
Recurrent inappropriate compensatory behaviors in order to prevent weight gain, such as: vomiting, laxatives, diuretics, fasting, or excessive exercise
The binge eating and inappropriate compensatory behaviors both occur at least once a week for 3 months
Self worth heavily influenced by body shape and weight
Patient does not meet anorexia nervosa criteria
Severity Scale
Mild: An average of 1–3 episodes of compensatory behaviors per week. Moderate: An average of 4–7 episodes of compensatory behaviors per week. Severe: An average of 8–13 episodes of compensatory behaviors per week. Extreme: An average of 14 or more episodes of compensatory behaviors per week.

glucose metabolism, hypophosphatemia, hypomagnesemia, and hypokalemia. Patients with AN are at an increased risk for refeeding syndrome as compared to BN patients. While not all patients who are re-fed develop these dangerous complications, it is important for the healthcare team to be aware of the condition and anticipate problems to help minimize complications.[6] Risk factors for refeeding syndrome include severe emaciation, hypophosphatemia, NGT feeds, etc. If risk factors are noted in spite of the severity of malnutrition, often it is necessary to re-start patients on a low level of kcals and to increase it slowly. The hospital is the safest place to refeed a patient at risk of this deadly disorder.

Endocrine Disorders and Osteopenia/osteoporosis

In response to the malnutrition state that develops in AN, several hormonal changes occur in order to preserve energy.[7] Thyroid function panel tests usually show a low to normal TSH level, decreased T4 levels (lower limits of normal), and a decreased T3 level (below normal), known as euthyroid sick syndrome. It is important to not mistakenly treat an ED patient for hypothyroidism with exogenous thyroid hormone, as that would exacerbate weight loss. Refeeding itself will correct these abnormalities.

Malnutrition also leads to a hypogonadotropic hypogonadism with decreased levels of LH, FSH, and estradiol. The amenorrhea that results in AN leads to osteopenia and osteoporosis.[8] In those with AN, bone density falls during the time that the patient has amenorrhea, causing problems from both the lack of expected increase during adolescent years and the ongoing decreases that are similar to those that occur in menopause. Even when individuals resume normal eating with normal weight and a return of menses they will never fully be able to make up what was lost during their amenorrhea.[9] It is therefore important during treatment to focus on a return of menses as quickly as possible. This generally occurs around the return of 10% below ideal body weight. Importantly, for those patients who were overweight, lost a significant amount of weight and are still at or above ideal body weight, return of menses may not occur until they reach a weight that is much higher than 90% of ideal body weight.[4]

Gastrointestinal Abnormalities

Most adolescents are guarded about their desire for weight loss at least upon initial presentation. As a result of this it is not unusual for ED patient to instead report early satiety, nausea, or abdominal pain as the main cause for decreased dietary intake. Gastrointestinal issues may occur at some point during the course of the illness. In AN there may be some gastrointestinal symptoms related to gastric motility including delayed gastric emptying, constipation, abdominal pain, diarrhea, nausea, and rarely vomiting.[10] These symptoms may interfere with weight gain but are very rarely dangerous. In BN, gastrointestinal symptoms are usually due to esophageal irritation with potential long-term risk of squamous cell dysplasia and esophageal cancer. Additionally, Mallory Weiss tears can be seen and place patients at increased risk of Boerhaave's syndrome and esophageal rupture.

Hematological Complications

Hematologic complications like anemia, neutropenia, and thrombocytopenia can also occur with the malnourished AN patient.[7] The anemia seen is a normochromic normocytic anemia and amenorrhea is protective against its development. Rarely, low WBC and platelets can be seen. In this situation a hematology consult should be done to rule out malignancy.[4]

Other Medical Complications

Patients with EDs rarely have pulmonary complications such as spontaneous pneumothorax or aspiration pneumonia, or renal complications, such as prerenal azotemia or fanconi's syndrome. Aside from the hyponatremic seizures previously discussed,

neurological complications such as peripheral neuropathy and atrophy of the brain have also been described in literature. These changes are generally considered reversible but there is some evidence that the effects of malnutrition can be long lasting.[11]

Medical Evaluation by the Primary Care Physician: The medical work up recommended for patients with EDs is directly tied to the medical complications previously discussed and should be done to assess for medical stability at the time of presentation as well as to rule out other causes of malnutrition.[12] Laboratory tests should be performed on all patients at presentation and include a complete blood count (CBC), comprehensive metabolic panel (CMP) and thyroid hormone studies. Amenorrheic patients should be tested for levels of LH, FSH, estradiol, prolactin, and in those sexually active a pregnancy test should be performed. Those patients who have been amenorrheic for longer than 6 months may undergo bone density testing. In bradycardic patients or patients with a history of significant vomiting an ECG should be performed. In patients where the cause of malnutrition is not completely clear additional tests such as brain MRI, celiac screen, erythrocyte sedimentation rate or endoscopy studies may be performed. A summary of the suggested medical evaluation can be seen in Table 3.

Hospital Admission and Discharge: After initial presentation and medical work up it is important for a PCP to consider the criteria for the correct level of care. Most literature concurs that admission is necessary for those less than 75% of ideal body weight and/or with a heart rate of less than 40bpm.[13] Other medical, nutritional and psychological factors to be considered are outlined in the version published by the Society for Adolescent Health and Medicine and are listed in Table 4.

Psychiatric Referral: All patients that do not meet criteria for inpatient hospitalization should be referred for immediate psychiatric evaluation. Early psychiatric evaluation and intervention are extremely important, as without being properly treated the medical complications discussed above are more likely to develop, continue to occur, or worsen. PCPs can refer patients for an outpatient initial consultation to help determine the appropriate level

Table 3: Initial Laboratory Evaluation

All Patients	*Amenorrheic Patients*	*Amenorrheic For More Than 6 months*	*Bradycardic Patients or Those with Significant Vomiting*
CBC	LH, FSH	DEXA Scan	ECG
BMP	Estradiol		
Thyroid Function Panel	Prolactin		
	*Pregnancy test		

*If sexually active female

Table 4: Indications for Hospitalization in an Adolescent with an Eating Disorder

Severe Malnutrition (weight ≤75% average body weight for age, sex, and height)
Dehydration
Electrolyte Disturbances (hypokalemia, hyponatremia, hypophosphatemia)
Cardiac Dysarrthymia
Physiologic Instability • Severe bradycardia (HR < 50 beats/min daytime; <45 beats/min at night) • Hypotension (<80/50 mmHg) • Hypothermia (body temp <96°F) • Orthostatic Changes in pulse (>20 beats per minute) or blood pressure (>10mmHg)
Arrested growth and development
Failure of outpatient treatment
Acute food refusal
Uncontrollable binging and purging
Acute Medical Complications of Malnutrition (syncope, seizures, cardiac failure, pancreatitis, etc)
Acute Psychiatric Emergencies (suicidal ideation, acute psychosis)
Comorbid Diagnosis that Interferes with the Treatment of the Eating Disorder (severe depression, obsessive compulsive disorder, severe family dysfunction)

*Adapted from the Society for Adolescent Health and Medicine

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of care, varying from outpatient day treatment programs to inpatient psychiatric eating disorder programs, to residential treatment programs. Another factor that may influence the choice of a care facility would be if a patient had suicidal ideation. In that situation it would be necessary for the patient to go to a psychiatric inpatient unit and eventually transfer to a more eating disorder focused treatment plan. In addition to this, residential treatment centers can be great for patients who have failed outpatient treatment. The psychiatric evidence based treatment therapy for AN is Family Based Therapy (FBT) while for BN it is enhanced Cognitive Behavioral Therapy (CBT-e).[13,14] There is no FDA approved pharmacological treatment for AN but there has been some evidence of atypical antipsychotics, such as olanzapine being helpful in the acute stage in severe cases and in SSRIs during the maintenance phase.4 Fluoxetine is the only FDA approved medication for BN.

The treatment of these complex patients requires a team treatment setting. A primary care physician, adolescent medicine specialist, therapist (SW, PhD, etc.), psychiatrist, nutritionist, and family must all work together for the patient's best interest. A PCP may also need to involve CPS if they discover that parents have failed to establish psychiatric care or medical follow up for their child.[4]

Recommendations: Primary care physicians can play a primary and critical role in ED patient's lives by initially recognizing signs of an ED, completing a medical laboratory workup, and managing the medical complications of the ED. All patients that do not meet criteria for inpatient hospitalization should be referred for psychiatric evaluation. In addition to this it is important for PCPs to continue to monitor the medical status of their patients while outpatient treatment proceeds and can help work with the treatment team to facilitate transfer to a higher level of care when necessary.[4]

Case Report Conclusion:

Frannie met criteria for hospitalization due to her being less than 75% of her ideal body weight, her resting heart rate under 50bpm, and her comorbid depression with passive suicidal ideation. As an inpatient in the hospital she was medically worked up and seen by the inpatient child psychiatry team who recommended that she attend the eating disorder day program at the hospital for treatment.

Endnotes

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