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Approach to Eating Disorders in a Pediatric Population - UPDATED

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Disclaimer

The content of this podcast focuses on the presentation, diagnosis, and management of eating disorders. Please note that material presented may be distressing for some listeners.

Objectives

By the end of this podcast, you will be able to:

1. Discuss the epidemiology, etiology, and comorbidities of pediatric eating disorders.
2. Define the criteria for diagnosis of various pediatric eating disorders and distinguish their clinical presentations.
3. Describe appropriate monitoring and management for inpatient cases of eating disorders.
4. Identify medical and psychiatric complications of pediatric eating disorders.
5. Describe outpatient treatment options and prognosis for pediatric eating disorders.

Case Overview

Let's begin with a case. You are a third-year medical student working on your inpatient pediatrics rotation, and your team receives a request to consult on a patient for direct admission. The patient is a 15-year-old female with a known medical history of anorexia nervosa seen in clinic earlier today by her family physician and found to have a BMI of 16 with a blood pressure of 78/53 and heart rate of 42. She was brought to hospital by her parents and is awaiting consult for admission and treatment.

Introduction

Eating disorders, or EDs, are increasingly common psychiatric diagnoses among pediatric populations with significant morbidity and mortality. A 2023 systematic review found that, globally, 22% of children and adolescents engaged in disordered eating, with COVID-19 resulting in increased symptoms amongst youth^{1,2}. Disordered eating is more common amongst female populations, however diagnoses in male populations are increasing². The median age of onset of pediatric EDs is decreasing, most recently estimated to be 12.5 years old³. It is important to note that rates of disordered eating behaviours are even higher in lesbian, gay, bisexual, and transgender populations⁴.

An alteration in the transmission and activity of serotonin is hypothesized to play a role in the development of EDs⁵. Biological risk factors for the development of EDs include genetic susceptibility, female sex, and diagnosis of autoimmune or autoinflammatory disease⁶. Psychiatric risk factors include adverse childhood experiences, as well as personality traits of anxiety, perfectionism, and obsessive-compulsivity⁶. Environmental influences of high academic stress, food insecurity, exposure to thin ideal body image media, and involvement in elite athletics are also found to be risk factors for the development of EDs⁶.

Definitions⁷

Let's review the definitions of various EDs.

Anorexia nervosa

Anorexia nervosa is characterized by three features including a persistent restriction of food intake, an intense fear of weight gain or behaviour interfering with weight gain, as well as a disturbance in one's perception of their weight or body shape, such that body weight is maintained below minimally normal level for one's age, sex, development, and physical health. Anorexia nervosa may be subtyped as restricting, characterized by dieting, fasting and/or excessive exercise to maintain a certain weight, or binge-eating/purging subtype, characterized by self-induced vomiting or misuse of medications such as laxatives, diuretics, or enemas to maintain weight. Severity of this disorder is based on the individual's BMI.

Bulimia nervosa

Bulimia nervosa is also characterized by three features which must be present at least once per week for 3 months, including recurrent binge eating episodes, recurrent and inappropriate compensatory behaviours to prevent weight gain, and unduly influence of body shape and weight in regard to self-evaluation. Binge eating episodes are defined as discrete periods of time where an individual consumes a larger quantity of food than is considered normal, and must be accompanied by a sense of lack of control to refrain from or stop eating. Vomiting is the most commonly employed compensatory behaviour, however other methods include laxative or diuretic misuse, enema misuse, thyroid hormone intake, or insulin omission or reduction. Fasting or excessive exercise may be employed to prevent weight gain. Though diagnostic characteristics are similar, bulimia

nervosa is distinct from anorexia nervosa in that individuals with bulimia nervosa are within normal or overweight range of BMI.

Binge-eating disorder

Binge-eating disorder is characterized by recurrent episodes of binge eating that occur at least once per week for at least 3 months, and are accompanied by at least 3 features of eating more rapidly than normal, eating until feeling uncomfortably full, eating large amounts of food though not physically hungry, eating alone as a result of embarrassment due to quantity of food consumed, and/or feeling disgusted with oneself, depressed, or guilty following these episodes. Marked distress regarding these behaviours is present, and binge eating episodes often occur in secrecy. Severity of binge-eating disorder is defined by the number of episodes that occur per week, with episodes of extreme binge-eating disorder occurring 14 or more times in a week.

ARFID

Avoidant/restrictive food intake disorder, or ARFID, is characterized by failure to meet nutritional requirements resulting in significant weight loss, nutritional deficiency, dependence on enteral feeding or oral nutritional supplements, or interference of psychosocial functioning. Importantly, it is not associated with a disturbance in one's perception of their body weight or shape. This avoidance or restriction may be a result of aversion to sensory characteristics of food such as appearance, colour, smell, texture, temperature or taste. Alternatively, it may be secondary to previous negative experience with food intake such as choking or repeated vomiting.

Case Revisited

Let's revisit the case. You meet the patient and her parents on the pediatric ward to complete the consult. You learn that she has been severely limiting her calorie intake and running 5 kilometers at least twice daily for the past three years in order to maintain her weight, and notes on her chart from the family physician show ongoing weight loss despite engaging in several outpatient treatment strategies. During your interview, she tells you "I can't afford to be here, I missed my run this morning". You see that she is severely cachectic and note that her recorded BMI on exam today is 15.40. You recognize that she meets the diagnostic criteria for anorexia nervosa, current severity severe. You review your plan for investigations and management with your attending.

Assessment

Pediatricians and primary care practitioners have unique opportunity to identify and treat EDs in their early stages with regular screening of eating patterns and disordered eating behaviours⁴. Screening can be conducted as a component of the psychosocial history, often implemented in the "HEADSS" format, and practitioners should be careful to avoid use of language that inadvertently reinforces unhealthy weight-control practices. The SCOFF questionnaire may be used for screening of ED symptoms, while the Eating Disorder Examination Questionnaire is often used to comprehensively assess symptoms of EDs in pediatric populations, and reviews recent eating patterns, dietary restrictions, and concerns about body image^{8,9}. A thorough physical examination should

also be conducted, and unexplained weight loss, growth curve abnormalities, and delays in puberty or secondary amenorrhea should instigate discussion regarding eating behaviours.

Clinical Features⁴

EDs may manifest as widely systemic symptoms and signs, including abnormal vital signs such as a low resting heart rate, orthostasis, and hypothermia. Patients may present as flat or anxious in affect. Physical signs include pallor, cachexia, thinning scalp hair, or lanugo. Patients may have cardiac murmurs with cool extremities, abdominal tenderness, and delayed pubertal development. Patients with history of purging may have dental erosions and/or Russel's sign, characterized by knuckle abrasions from self-induced vomiting. Bruising or abrasions of the spine may be noted, secondary to excessive exercise.

Assessment Continued⁴

Assessment of a pediatric patient with ED should be comprehensive, including a medical, nutritional, and psychiatric history, with detailed physical examination. Questions exploring weight history, body image, diet history, exercise history, and binge-eating and/or purging behaviours should be discussed. Psychiatric history should explore depression, anxiety, self-injury, suicidal ideation, and substance use. Discussion regarding the youth's home, school, and social life is important and may elucidate factors contributing to their presentation. Physical examination should include assessment of weight, height, and BMI, and identified vital signs of low body temperature, resting blood pressure and resting heart rate may implicate energy restriction. Orthostatic hypotension may suggest restricted fluid intake or volume depletion from purging.

An extensive differential diagnosis for this presentation exists, and investigations to rule out causes such as inflammatory bowel disease, celiac disease, gastroesophageal disease, food allergy, hyperthyroidism, diabetes mellitus, adrenal insufficiency, and chronic infection should be conducted when appropriate.

A comprehensive battery of initial investigations is necessary to assess for medical complications of EDs that may develop as consequences of malnutrition, weight changes, or purging, as we will discuss next.

Associated Complications¹⁰

Psychiatric

Psychological symptoms are often a pronounced component of ED presentations and may be secondary to starvation from the ED itself and abate with replenished nutrition. Symptoms may be representative of a comorbid psychiatric disorder, with anxiety disorders being most common, as well as obsessive-compulsive, depressive, or bipolar disorders. Comorbid substance use disorders are prevalent and may influence treatment and outcomes. Neurodevelopmental diagnoses including ADHD and autism spectrum disorder are noted in heightened prevalence amongst individuals with EDs. A

third of patients with EDs report non-suicidal self-injury behaviours. Several studies have found evidence for a genetic association between EDs and suicidal ideation, and suicide is noted as a leading cause of death amongst individuals with EDs.

Cardiovascular

Cardiovascular complications of EDs have significant mortality and are often attributed to restrictive EDs secondary to malnutrition, dehydration, and electrolyte imbalance. Structural cardiomyopathies may manifest as decreased left ventricular mass with resultant LV end diastolic and end systolic volume decrease, mitral valve prolapse or pericardial effusion. Conduction abnormalities including bradycardia or QT prolongation may occur, and repolarization abnormalities may result secondary to electrolyte disturbances with hypokalemia being the most significant. Vital signs should be monitored regularly to assess for adequate perfusion, and ECG investigation should be performed.

Gastrointestinal

Gastrointestinal symptoms are common, with majority of individuals with EDs endorsing fullness, early satiety, abdominal bloating, pain, and/or nausea secondary to delayed gastric emptying and slowed intestinal transit time. Constipation is also a common symptom that requires careful management. A history of self-induced vomiting may result in esophageal mucosal damage with Mallory-Weiss tears being a severe outcome. Salivary and parotid glands may hypertrophy as a result of regular vomiting. Malnutrition may cause transaminase and coagulation time elevations with normalization after treatment.

Endocrine

Extensive endocrine dysfunction can result from restrictive EDs. Thyroid dysfunction most commonly manifests as euthyroid sick syndrome with low T3 and normal TSH levels. Hypercortisolemia may occur. Growth abnormalities including retardation, short stature, and pubertal delay may occur, with permanence of these complications more common in patients diagnosed at younger ages. Male adolescents may be at heightened risk for growth deficit with development of ED in middle teenage years as a result of later pubertal transition and therefore later peak growth. Reproductive complications are manifested by suppression of the hypothalamic-pituitary-gonadal axis secondary to weight loss, excessive overactivity, and stress. Male patients may have small testicular volumes with low testosterone, and female patients most commonly present with amenorrhea and low estrogen. Though these findings may influence fertility, studies show recovery of reproductive capacity with appropriate treatment and weight restoration. Serum gonadotropin, prolactin, estradiol, and testosterone levels may be useful for assessment and monitoring throughout treatment.

Musculoskeletal

Malnutrition during skeletal development can result in bone loss and poor bone mineral density with irreversible consequences of osteoporosis, increased fracture risk, and

scoliosis in adulthood. A bone mineral density scan may be utilized to assess bone resorption.

Electrolyte

Dehydration may occur in any patient with ED, regardless of severity. Disturbances in osmotic regulation may present as central or renal diabetes insipidus, or syndrome of inappropriate antidiuretic hormone. Patients who purge may develop hypokalemic, hypochloremic metabolic alkalosis secondary to vomiting. Laxative misuse may present with extensive electrolyte and acid-base disturbances including hypoproteinemia, hypophosphatemia, and hypomagnesemia. Patients who “water load” to reduce hunger may present with dilutional hyponatremia. Serum electrolytes should be monitored closely throughout management and treatment.

Refeeding syndrome is a critical consideration in the treatment of EDs. Refeeding syndrome is a potentially life-threatening condition wherein rapid electrolyte and fluid shifts occur upon feeding resumption in malnourished patients. This condition is characterized by hypophosphatemia as insulin is released upon refeeding and phosphate moves intracellularly in the context of systemic depletion, leading to metabolic, cardiovascular, neurologic, and hematologic consequences. Patients undergoing re-nourishment should have serum electrolyte, magnesium, phosphorous, and glucose levels closely monitored with appropriate phosphate and thiamine supplementation¹¹.

Treatment^{12,13}

As described, EDs carry complex presentations and thus require comprehensive treatment, generally involving a multidisciplinary and long-term approach. Goals of treatment include return to healthy weight and growth trajectory, as well as establishment of healthy eating behaviours and relationships with food and body image.

Outpatient

Most patients are treated in the outpatient setting. A treatment goal weight is identified based on the patient’s age, height, premorbid growth trajectory, pubertal stage, and menstrual history, and is re-assessed frequently throughout treatment. “Food is medicine” is a common sentiment that underlies treatment, and stepwise introduction of meals and snacks is initiated to re-establish regular eating patterns. A nasogastric tube may be necessary, more often in the case of hospitalized patients, when nutritional needs are not being met with oral feeding. Multivitamin supplementation can be introduced, and constipation is recommended to be managed with non-stimulant laxatives to avoid electrolyte derangement. Education pertaining to physiologic and psychologic effects of food restriction should begin early in treatment and continue throughout. Follow up visits should be frequent and regular and consist of discussion with the adolescent patient alone as well as with the family as a whole.

Facility/Inpatient

Day-treatment or residential facilities, where social and therapy programming are offered, may be necessary for patients who require an increased level of care. Hospitalization may be required if indicators of medical instability are present, such as severe bradycardia and hypotension as described in the presented patient case.

Psychotherapy

Family-based treatment is a specialized eating-disorder focused therapy widely recognized as first-line intervention for pediatric EDs, that focuses on recovery of disease rather than cause. This treatment involves 3 phases throughout which the entire family meets with the therapist. Phase 1 focuses on weight restoration by empowering families to take responsibility over meal planning and preparation. In phase 2, after substantial weight recovery, meal responsibility is gradually transferred to the adolescent, and phase 3 therapy focuses on psychosocial development. While FBT may not be available in all communities, principles of this intervention can be integrated by all providers.

Evidence shows utility for cognitive behavioural therapy in the treatment of bulimia nervosa and binge-eating disorder, with focus on restructuring disordered thoughts and eating behaviours.

Pharmacotherapy

The use of pharmacotherapy is primarily studied in adult EDs and more research in pediatric populations is necessary. Selective serotonin re-uptake inhibitors (SSRIs) may be utilized to treat symptoms of comorbid mood or anxiety disorders to good effect. While the use of SSRIs and atypical antipsychotics such as quetiapine, risperidone, and olanzapine have been shown to have little weight gain improvement in restrictive EDs, SSRIs such as fluoxetine have been found to be effective for treatment of adult bulimia nervosa.

Prognosis⁴

Reported prognoses for adolescents are variable, however it is found that recovery from EDs among adolescent populations is more successful than in adult groups. Earlier intervention results in higher rates of recovery, an important consideration in light of a recent study showing a greater than 5 year average delay between ED symptom onset and treatment¹⁴. Mortality from pediatric EDs is largely due to death by suicide or secondary to severe medical complications. Prevention efforts can be made early on in the community setting through the demonstration of support and use of language that recognizes all body types, and the instigation of healthy discussion about weight and weight-related behaviours. These principles can be adopted not only by health practitioners, but also advocated for in the academic, athletic, and social spaces occupied by our youth.

I hope you have enjoyed this podcast on an approach to pediatric eating disorders. Let's review some key learning points:

- Females and members of the LGBTQ community are at higher risk for EDs, but incidence among male youth is increasing
- There are various subtypes of EDs including anorexia nervosa, bulimia nervosa, binge-eating disorder, and avoidant/restrictive food intake disorder
- Community care providers have an important role in the regular discussion of and screening for disordered eating behaviours
- There are many serious psychiatric and multi-system medical complications that result from EDs
- Treatment of EDs focuses on interprofessional collaboration and the inclusion of families throughout the recovery process
- Efforts to promote body-inclusive language and engage in healthy discussions regarding weight should be made by individuals who interact with youth in order to aid in the prevention of disordered eating behaviours

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