



Adolescent males with atypical anorexia nervosa and premorbid obesity: three case reports

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Abstract

Purpose Premorbid obesity is an identified risk factor for eating disorder (ED) development among adolescent males. However, pervasive gender- and weight-related biases about ED inhibit timely diagnosis and treatment among this demographic. This study examined the psychological and medical characteristics of three adolescent males with premorbid obesity who were not diagnosed with atypical anorexia nervosa (AAN) until medical sequelae of malnutrition warranted emergent hospitalization. Factors associated with diagnostic delays among these cases were identified to facilitate increased awareness of this at-risk demographic.

Methods Retrospective chart review was conducted on three adolescent males (aged 12–17) with AAN and premorbid obesity who were medically hospitalized for 13–24 days ($M=20.3$, $SD=9.7$). Demographic variables, psychological characteristics, and physical data were extracted.

Results Each case presented at normal or overweight BMI status ($M=22.7$ kg/m², $SD=3.2$) following a significant loss of weight ranging from 19 to 42% of total body mass ($M=31.7\%$, $SD=9.5$) over 5–12 months ($M=8.3$, $SD=2.9$). Plausible factors associated with diagnostic delays included initial weight loss recommendations by a medical provider, with little support or oversight; limited insight that symptoms were problematic; social reinforcement of dieting behaviors; low prevalence of psychiatric comorbidity; parental obesity; and parental history of bariatric surgery.

Conclusions These cases elucidate the importance of close follow-up of youth with obesity who are encouraged to lose weight. Further education about AAN among males with premorbid obesity is crucial for timely diagnosis and intervention.

Keywords Atypical anorexia nervosa · Males · Premorbid obesity · Diagnostic delay · Adolescents

Introduction

The incidence of eating disorders (EDs) among males is rising [1], yet EDs are widely conceptualized as female-specific illnesses. Gender biases about EDs could inhibit treatment

initiation among males [2], who often present for treatment with a longer illness duration [3]. This is concerning because delayed ED intervention predicts poorer outcomes [4]. Premorbid obesity, an identified risk factor for ED development in males [5], could further perpetuate treatment delays. Males with obesity and unhealthy weight behaviors could develop atypical anorexia nervosa (AAN) before reaching underweight status, yet symptoms could go unnoticed due to presenting at or above normal weight status. Individuals with AAN have often lost a greater percentage of body mass, can be more physically and psychologically compromised, and may receive suboptimal treatment than individuals with anorexia nervosa (AN) [6, 7].

In this study, we present three adolescent males with premorbid obesity, each emergently hospitalized at the time of AAN diagnosis. The purpose of this study is to present the physical and psychological characteristics of each case to advance understanding about this understudied

This article is part of topical collection on Males and eating and weight disorders.

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demographic. Further, factors associated with diagnostic delays will be identified and clinical considerations for early intervention among males with AAN and premorbid obesity will be discussed.

Methods

The inpatient ED program at a large Midwestern children's hospital provides acute stabilization for youth with medical complications of ED. All inpatients complete a psychosocial assessment battery upon admission. Guidelines by the Centers for Disease Control and Prevention [8] were used to classify premorbid weight status, with body mass index (BMI)-for-age \geq 95th percentile representing obesity; BMI-for-age \geq 85th percentile but less than 95th percentile representing overweight; and BMI-for-age $<$ 85th percentile representing normal weight. Patients included in this study were adolescent males (aged 12–17) with newly diagnosed AAN and premorbid obesity, hospitalized between July 2017 and July 2018. Three patients were identified and are presented using retrospective chart review. Physical and psychological characteristics of the cases are summarized in Table 1. This study was approved by the Institutional Review Board at Cincinnati Children's

Hospital Medical Center. Informed written assent and consent were obtained from participants and their parents, as the legal age by which consent may be provided in the United States is 18 years.

Psychosocial assessment battery

Eating disorder symptoms

The Eating Disorder Examination-Questionnaire (EDE-Q) [9] Global score was used to assess ED symptom severity. Norms developed in a community sample of adolescent males were used for interpretation [10].

Anxiety and depression

Anxiety and depression, hallmark comorbidities of AN [11] were measured with the Revised Child Anxiety and Depression Scale (RCADS) [12]. Total Anxiety and Major Depressive Disorder subscale scores were interpreted with age- and gender-specific norms [12].

Table 1 Physical and psychological characteristics of cases

	Case 1	Case 2	Case 3
Age (years)	15.5	17.3	12.4
BMI (kg/m ²) at presentation	21.4	26.4	20.4
BMI percentile for age at admission ^a	66%	90%	79%
Diagnosis	AAN	AAN	AAN
Daily oral intake at admission (kcal)	800	500	1000
Duration of weight loss (months)	12	8	5
Percentage of total body mass lost at admission	42%	34%	19%
BMI z score change at admission	− 2.35	− 1.34	− 0.98
Degree of malnutrition at presentation ^b	Severe	Severe	Severe
Heart rate (bpm) nadir during admission ^c	29	27	34
Phosphorous supplementation required during admission	Yes	No	Yes
Hospital length of stay (days)	24	13	15
ED symptoms at presentation (EDE-Q global score)	1.89 ^d	3.48 ^d	2.76 ^d
Clinical impairment secondary to EDs at presentation (CIA global score)	3	12	19 ^d
Emotion dysregulation at presentation (DERS total score)	56	56	66
Depression symptoms at presentation (RCADS major depression subscale score)	42	42	51
Anxiety symptoms at presentation (RCADS total anxiety subscale score)	41	< 37	40

AAN atypical anorexia nervosa, bpm beats per minute, ED eating disorders, EDE-Q Eating Disorders Examination Questionnaire, CIA Clinical Impairment Assessment, DERS Difficulties in Emotion Regulation Scale, RCADS Revised Child Anxiety and Depression Scale

^a[8]

^b[19]

^cTypical daytime resting heart rate for an adolescent is 58–92 bpm [20]

^dClinically elevated

Emotion regulation

Impairments in emotion regulation (ER) skills are implicated in the development and maintenance of AN [13]. ER skills were assessed with the Difficulties in Emotion Regulation Scale (DERS) [14]. Total scores were interpreted with norms established in undergraduate males [14].

ED-specific impairment

The Clinical Impairment Assessment (CIA) [15] measured self-reported impairment secondary to ED symptoms. A CIA global cut-off score of 16 is considered the best cut-point predictor for ED status [15] and was used for interpretation in this study.

Cases

Case 1

C1 was a 15-year-old, Caucasian male who presented to an urgent care clinic for nausea and stomachache. Upon evaluation, C1 was found to be bradycardic [41 beats per minute (bpm)] and hypotensive. He was then sent to a local emergency department, where he was diagnosed with AAN and hospitalized for abnormal vital signs. C1 had lost 42% of his total body mass (47.9 kg) over 1 year through dietary restriction (800 kcals/day) and excessive exercise (2 h/day). His admitting BMI was 21.4 kg/m², 66th percentile for age [8], representing normal weight status. His premorbid BMI represents obese status (43.5 kg/m², 99th percentile). Dieting was motivated by weight-related teasing and recommendations to lose weight by his primary care provider (PCP). At admission, C1 perceived himself to be “too thin”, but was terrified of regaining weight. He wanted to increase his muscle mass while maintaining his current weight. Both of C1’s parents were of obese stature and had hypertension. C1 had no history of mental health problems and family history was significant for paternal anxiety and remitted AN in a maternal aunt.

Case 2

C2 was a 17-year-old Caucasian male who lost 30% of his total body mass (36.4 kg) in 8 months. His PCP expressed concerns about his weight loss at an outpatient visit, placed a referral to an ED program, encouraged increased intake, and arranged follow-up for 1 month. Upon receiving the referral and conducting a routine chart review, the ED program care coordinator found C2 was bradycardic (48 bpm) at his recent PCP visit. C2’s family was contacted, he was emergently evaluated, was hospitalized for bradycardia on

EKG (39 bpm) and diagnosed with AAN. C2’s historical growth records revealed abnormal weight gain leading to an increase in BMI from overweight status at 10 years (BMI of 26.4 kg/m², 90th percentile) to obesity by 14 years (BMI of 37.3 kg/m², 99th percentile). Dieting was triggered by a recent hypertension diagnosis and weight loss recommendations. He restricted his nutritional intake to 500 kcals/day, exercised for 90 min/day, and engaged in self-induced vomiting up to three times per week. At admission, C2 was afraid of regaining weight but was open to gaining lean muscle mass. C2 had a premorbid history of anxiety and attention deficit hyperactivity disorder. His parents presented as obese and his mother had a history of bariatric surgery. Family history was significant for paternal hypertension, hypercholesterolemia, stroke, and anxiety.

Case 3

C3 was a 12-year-old Caucasian male who began dieting following PCP concerns for obesity. C3’s historical BMI was consistently in the overweight range, yet increased to obese status at 11 years (25.2 kg/m², 96th percentile). He restricted intake to 1000 kcals and exercised up to three times per day, meticulously counted calories, and became progressively moody. Concerned, his mother contacted his PCP and a referral was placed for a specialized ED evaluation, where C3 was found to be bradycardic (44 bpm) prompting emergent hospitalization. Upon admission, C3 had lost 19% of his total body mass (10.6 kg) and was diagnosed with AAN (BMI of 20.4 kg/m², 79th percentile). C3 perceived his body size to be “okay” but believed his stomach was “too big”. He was afraid of getting “fat”, but was willing to increase his lean muscle mass. Neither C3 nor his family had a prior history of mental health diagnoses. His parents presented as overweight and his mother had a history of bariatric surgery.

Discussion

These case studies underscore the gravity of delayed illness identification and treatment among adolescent males with AAN and premorbid obesity. Despite severe malnutrition secondary to significant weight loss, ranging from 19 to 43% of total body mass over 5–12 months, the males in this study were not diagnosed with AAN until medical complications necessitated emergent hospitalization. This pattern is consistent with research that the majority of adolescent males with restrictive ED will be medically unstable at diagnosis [5] and may reflect common biases toward females and underweight status in ED recognition.

The males in this study experienced premorbid obesity, prompting PCP recommendations for weight loss, in line with the US Preventive Services Task Force (USPSTF)

recommendations for the treatment of obesity. To support healthy weight loss, the USPSTF also recommends that youth be referred for a comprehensive behavioral intervention, noting that studies demonstrate effective and safe weight loss only with a minimum of 26 contact hours over 12 months [16]. To our knowledge, the males in this study were not referred for supportive behavioral interventions. Further, frequent PCP follow-up or support from a dietitian was not facilitated to guide healthy behaviors. Historical records suggest that each male was seen by his PCP at least once during weight loss and two of the three males were questioned about their behaviors. Whereas the specific content of these assessments is unclear, problematic eating behaviors were denied, despite extreme dietary restriction and excessive exercise, making ED detection difficult. Ultimately, specialized ED referrals and, in one case, an emergency room visit were prompted by growing concerns about weight loss and abnormal vital signs.

On psychological assessment, all males endorsed clinically significant ED symptoms, yet only one male perceived symptoms as problematic. Delayed illness recognition, secondary to gender and weight biases about ED, could have lessened the external consequences of ED, resulting in less perceived psychosocial impairment among the males in this study. Further, the males did not report anxiety, depression, or emotion dysregulation, contradicting previous findings of high psychiatric comorbidity in restrictive ED, independent of sex or weight status [5, 7]. While ED assessment tools may not be sensitive to male ED concerns specifically [2], it is unclear why comorbidity was unremarkable and could further contribute to delays in ED identification. It is also plausible that adolescent males with restrictive EDs and premorbid obesity present a different psychological profile than males who are of normal weight status prior to ED development.

With respect to body image, the males in this study were terrified of regaining weight and were adamant that weight gain via muscle mass was the only acceptable intervention. This presentation is consistent with the findings that males are more preoccupied with body composition than thinness [3]. Prior research suggests that individuals with AAN experience greater fears of fatness and distress about eating than individuals with AN [7]. Perhaps ED attitudes and behaviors among the males in this study were normalized due to social constructions about obesity (e.g., people with obesity “should” desire weight loss), further perpetuating delayed diagnosis.

Elevated weight status among parents was another common factor in this study, with all biological parents presenting with overweight/obesity. Personal weight dissatisfaction and reports of “failed” dieting efforts were common themes discussed among parents. Parental weight concerns and behaviors are identified risk factors for the development

of EDs and obesity [17]. It is noteworthy that the mothers of two males had a history of bariatric surgery. The highly restrictive pre- and post-operative diet required for this procedure was likely modeled to the males and could have increased risk for development of EDs and obesity. Further, parental obesity could be a unique factor associated with delayed diagnosis among males with restrictive EDs and premorbid obesity. In parents with overweight/obesity, personal experiences with the consequences of obesity could perpetuate reinforcement of extreme dieting behaviors. As research suggests up to 25% of females whose mothers encouraged weight loss were engaged in extreme weight control behaviors [17], an examination of this trend in males is warranted. Themes from these case studies highlight the critical importance of parental education about the negative consequences of weight talk and dieting, even when well intentioned. Further, educating parents about healthy eating behaviors, regardless of parental weight status, is imperative to best support youth with obesity [16].

We offer the following clinical considerations based on findings from this study. First, males with premorbid obesity are particularly vulnerable to ED development, warranting efforts to further educate society and health care providers. Greater awareness could prompt rapid diagnosis and intervention, which is associated with improved outcomes [4]. Second, among adolescents with obesity who are encouraged to lose weight, it is imperative that PCPs provide guidance to both adolescents and parents on how to lose weight healthily via close follow-up [16]. Third, ongoing assessment of eating and exercise behaviors throughout weight loss is imperative. Parent inclusion in assessment could be crucial for early ED diagnosis, as males with premorbid obesity may be less inclined to perceive behaviors as problematic [2]. Finally, promotion of knowledge about and utilization of published criteria for medical admission for individuals with EDs among medical providers is imperative [18].

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee (Cincinnati Children’s Hospital Medical Center Institutional Review Board, Study ID 2017-2569) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Informed consent Informed assent and consent were obtained from all individual participants and their parents due to participants being under 18 years of age.

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