

# Obesity preceding onset of Anorexia Nervosa: Core challenges in identification and treatment

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## Abstract

Typical presentations for Anorexia Nervosa consist of a patient with a BMI lower than 18.5. Presenting features often include loss of menarche in females, lanugo and bradycardia. Eating disorder professionals are seeing an increase in presentations of Anorexia Nervosa that stray from this description. It is becoming more common to see patients with a BMI greater than 24.9 who were previously obese, but experienced rapid weight loss as a result of severe restriction. These patients are more difficult to diagnose and treat due to their unusual presentation.

**Abbreviations:** BMI: Body mass index; RD: Registered dietitian; HR: Heart rate; BP: Blood pressure; CMP: Comprehensive metabolic panel; AN: Anorexia nervosa; TF: Tube feed; NGT: Nasogastric tube feeds; EKG: Electrocardiography ; OSFED: Other specified feeding or eating disorder; EDNOS: Eating disorder not otherwise specified; HEENT: Head eyes ears nose throat physical examination; DSM-IV: The diagnostic and statistical manual of mental disorders, 4<sup>th</sup> Edition; DSM-V: The diagnostic and statistical manual of mental disorders, 5<sup>th</sup> Edition.

## Introduction

SM is a 17 year old male who presented to an Eating Disorders outpatient clinic at the 98<sup>th</sup> percentile for weight. His chief complaint was a 100 pound weight loss over the past 6-9 months. SM's mother, who is the primary caretaker, reported that SM had been seeing a Registered Dietitian (RD) at his pediatrician's office for 6 months for obesity. She reported that he had weighed 340 lbs a year ago and lost over 100 pounds in the past 6-9 months. However this did not become a concern for the parent or treating RD until he lost 20 pounds in the 4 weeks between his appointments. At this time he was referred to the Children's National Eating Disorders Clinic.

At this presentation, his weight was 103.8 kg (228.84 lbs), his height was 180 cm, Body Mass Index (BMI) 32.03, the 98<sup>th</sup> percentile placing him in the overweight range. His Blood Pressure (BP) was 126/59, Heart Rate (HR) was 42 beats per minute and mild malnutrition was noted due to drop in z-score for weight/age by 1.13.

SM was immediately admitted to Adolescent Medicine at Children's National Medical Center for intensive nutritional rehabilitation in the setting of bradycardia and rapid weight loss concerning for atypical anorexia nervosa. Upon admission, SM endorsed restrictive eating, excessive exercise and fear of gaining weight.

## Presentation

On admission, SM was mildly hypothermic with an oral temperature of 36.7 to 36.8 degrees C. He was bradycardic with a peripheral HR

between 41-51 bpm, although his blood pressures were within normal limits. His systolic BP was between 112-126 mmHg, and his diastolic BP was between 60-72 mmHg with a mean arterial BP of 80 mmHg. He has normal oxygen saturation ranging from 99-100% on room air. His admission weight was 102.9 kg. His physical exam was otherwise unremarkable on admission. He was awake, alert, and oriented with no focal neurological deficits. His abdomen was soft, non-tender, and not acute. He was cooperative and denied suicidal ideation. Aside from the notable bradycardia, his cardio-pulmonary exam was unremarkable, with good breath sounds bilaterally and unlabored breathing, as well as normal circulation and peripheral pulses bilaterally. There were also no other notable findings on his HEENT, musculoskeletal, or integumentary exams.

Serial CMPs were obtained during patient's hospitalization to monitor his electrolytes. Of note, while SM's phosphorous started off within normal limits, it was notably elevated at 6.1 Mg/dL by day 2 of his hospitalization, likely a result of refeeding syndrome. It remained elevated on the repeated daily checks, but reduced to 5.5 Mg/dL (mildly elevated) by his discharge on 7/4/17. In addition, SM's calcium level started off low on admission at 8.4 Mg/dL. The calcium level reached its nadir on day 3 of hospitalization at 8.0 Mg/dL, but was up to 8.7 Mg, dL on the day of discharge. Also of note, SM's CO<sub>2</sub> level was mildly elevated throughout his hospitalization. It was 28 Mmol/L on admission, got as high as 31 Mmol/L on day 5 of hospitalization, and was at 29 Mmol/L on the day of discharge. The remainder of SM's labs were unremarkable.

## Nutrition Care Plan:

SM began the AN protocol which included activity restriction, eating meals outside of the bed, monitored bathroom use, continuous cardiac monitoring and daily electrolyte monitoring. A nutrition consult was completed and nutrition rehabilitation plan developed.

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Nasogastric tube feeds (NGT) of 1.5 Nutren were gradually increased to reach a 1200-calorie diet during day 1. Overnight NG feeds of 1.5 Nutren were also given and gradually advanced throughout his hospital stay. The prescribed TF was Nutren 1.5 at 80 mL/hr, advance by 20 mL q 4 hours as tolerated until reach goal of 100 mL/hr x 8 hours overnight. At goal rate this provided: 7 mL/kg/day, 11 kcal/kg/day, and 0.47 g protein/kg/day. In addition, SM was on a 1500 kcal/day oral diet. Broken down, his meals each consisted of 500 kcal/meal with a goal to increase meal calorie amount by 300 kcals/day to goal calories of 2400 kcals/day. SM was allowed three food dislikes for the duration of his hospital visit which were removed from his meals but he otherwise had no further input on meals. Meals were limited to 30 minutes under the supervision of a staff member without any interruptions. In the occasion that SM did not consume 100% of his meals, the nurse was instructed to replace uneaten meal calories with Boost (1 mL = 1 kcal), offered first orally; if declined it was given via NGT, though SM was 100% compliant with meals so NGT of Boost was not necessary.

Daily prophylactic Potassium Phosphate and Sodium Phosphate (phos-NaK) supplementation was used during this hospitalization as well as Miralax. Daily basic metabolic panel, magnesium and phosphorus levels were used to monitor for refeeding syndrome. He did not display any hallmarks of refeeding syndrome with above nutritional rehabilitation plan.

During this admission, SM had episodes of bradycardia to the upper 20s and low 30s. His EKG showed sinus bradycardia and no other abnormalities. Nevertheless, he maintained adequate mental status and peripheral perfusion. SM remained on continuous cardiac monitoring and daily orthostatic vitals during his hospital stay. Cardiology was consulted for a systolic heart murmur III/VI noticed during his physical examination. No acute management was recommended, and the patient was referred for outpatient follow-up. Bradycardia was determined to be secondary to acute weight loss. His heart improved with nutritional rehabilitation and by discharge, his HR ranged from 50-60 bpm and he was hemodynamically stable. His weight was 101.2 kg at discharge, which is actually less than his admission weight, likely due to his hypermetabolic state after months of restrictive eating. SM's recommended goal weight range was determined to be 94 kg to 105 kg (95-98<sup>th</sup> percentile for BMI), though it is challenging to assess an appropriate weight range for a previously overweight male due to lack of usual markers in underweight females such as premorbid weight, reversal of amenorrhea and bone density. Although he remained compliant with meals during hospitalization, he continued to express an intense fear of gaining "too much weight".

PES Statement: Inadequate energy protein intake as related to Anorexia Nervosa as evidenced by bradycardia, reported rapid weight loss, and restricted intake

## Methods

This case report does not include any identifiable information and does not constitute as research. It is therefore IRB exempt.

## Discussion

Obesity preceding onset of Anorexia Nervosa leads to key challenges which may hinder early identification of the illness and also confuse treatment goals related to weight. This is especially challenging for the male population as a) Anorexia Nervosa is under recognized in males and b) premorbid obesity has been reported to be a major risk factor among boys with restrictive eating disorders [1,2]. The

case of SM highlights these challenges. SM's treating clinicians initially missed the severity of his restrictive eating because the initial focus of his pediatric and nutrition visits were on weight loss. Vital signs were not routinely conducted at each visit, so his developing bradycardia was initially missed. SM's weight was monitored and used as the primary indicator of health. Given that he never fell into the underweight range, early symptoms of Anorexia Nervosa were overlooked.

By medical standards, his BMI at admission categorized him as overweight and his appearance was not what comes to mind when most physicians think of a patient with Anorexia Nervosa. However SM has similar metabolic, cardiac, hematopoietic and endocrinological risks of an underweight patient with Anorexia [3].

Assessment of these risks in males poses a challenge due to lack of amenorrhea and bone mineral density as markers. It has been noted that more than two-thirds of normal-weight women with atypical AN have (BMD) Z-scores <-1.0 at one or more skeletal sites [4-7].

The new DSM-5 diagnostic criteria for Anorexia Nervosa removed a specific weight cut off as criteria for Anorexia Nervosa. Furthermore, the formal diagnosis of "Atypical AN" was created within Other Specified Feeding or Eating Disorder (OSFED) for individuals who meet AN psychological criteria but are not low weight—previously, atypical AN was not named but rather described as a numbered example of Eating Disorder Not Otherwise Specified (EDNOS) in *DSM-IV* [1]. This change ensures that patients like SM receive the correct diagnosis and evidenced based treatment. In addition, recent data suggest similar levels of eating disorder and general psychopathology between patients with *DSM-V* AN and atypical AN [2,3]. Based on his acute weight loss of 20 pounds in four weeks (average of five pounds a week over four weeks, while current recommendations are only 1-2 pounds a week for healthy weight loss), restrictive intake, excessive involvement/training for boxing, comments about losing weight, and bradycardia at his nutrition appointment, SM meets criteria for Atypical Anorexia Nervosa despite being in the medically overweight category. Had SM's condition continued to be overlooked, he would have continued to be at risk for medical and psychiatric complications. It is critical that clinicians begin to implement screening in patients who are trying to manipulate their weight so that those at risk for serious complications of eating disorders are not overlooked.

## Implications and contribution of the manuscript

When considering what a person diagnosed with Anorexia Nervosa looks like, for most, the image of an extremely thin female comes to mind. The reality is that frequently, an individual struggling with AN does not fit that description. In fact, an individual in the throws of Anorexia Nervosa can be overweight; that person can also be male. When considering a diagnosis of AN, our hope is that pediatricians and care providers will think beyond this stereotype and consider implementing screening tools that properly identify Anorexia Nervosa across the spectrum of size, shape, ethnicity, and gender, so that those in need can access appropriate treatment.

## Declarations

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## References

1. Carlat D, Camargo C, Herzog D (1997) Eating disorders in males: A report on 135 patients. *Am J Psychiatry* 154: 1127–1132
2. Muike A, Stein D, Arbess G (2003) Eating disorders in adolescent boys: A review of the adolescent and young adult literature. *J Adolesc Health* 33: 427-435
3. Vo M, Lau J, Rubinstein M (2016) Department of pediatrics, division of adolescent and young adult medicine, university of California, San Francisco, San Francisco, California.
4. Schorr M, Thomas JJ, Eddy KT, Dichtel LE, Lawson EA, et al. (2016) Bone density, body composition, and psychopathology of anorexia nervosa spectrum disorders in *DSM-IV* vs *DSM-5*. *Int J Eat Disord*.
5. American Psychiatric Association (2013) Diagnostic and statistical manual of mental disorders. 5th ed. Arlington, VA: American Psychiatric Publishing.
6. Stice E, Marti CN, Rohde P (2013) Prevalence, incidence, impairment, and course of the proposed DSM-5 eating disorder diagnoses in an 8-year prospective community study of young women. *J Abnorm Psychol* 122: 445-457.
7. Birgegård A, Norring C, Clinton D (2012) DSM-IV versus DSM-5: implementation of proposed DSM-5 criteria in a large naturalistic database. *Int J Eat Disord* 45: 353-361.