The Long Road to Metabolic Surgery: A Case Study of An Adolescent Female with Obesity and Multiple Comorbidities

Presented by:
Dyan Hes, MD, FAAP
Medical Director, Gramercy Pediatrics
Clinical Asst. Prof. Weill Cornell Medical College

Disclosure Information

Grain Foods Foundation
• Scientific Board Advisor
• 2018-present

Abbott Nutrition
• Speaker
• 2018-present

Objectives

• 1. What are the criteria for metabolic surgery in youth?
• 2. What is an obesity medicine physician?
• 3. What medicines can be used to treat obesity in youth?
What is an obesity medicine physician?

- The American Board of Obesity Medicine was established in 2011

- Obesity Medicine Physicians have a primary board in addition to studying obesity medicine at a higher level via CMEs, conferences, and/or fellowships.

- Board exam is given once a year

- The Mission of the ABOM

  - The American Board of Obesity Medicine (ABOM) serves the public and the field of obesity medicine by maintaining standards for assessment and credentialing physicians. Certification as an ABOM diplomate signifies specialized knowledge in the practice of obesity medicine and distinguishes a physician as having achieved competency in obesity care.

https://www.abom.org/

Obesity Medicine Growth Compared to ABM Subspecialty Growth

ABOM Diplomate Top 10 Primary Specialties

- Internal Medicine (2167)
- Family Medicine (1720)
- Endocrinology (946)
- Pediatrics (554)
- Cardiology (243)
- OB/GYN (229)
- Gastroenterology (169)
- Psychiatry (104)
- Emergency Medicine (101)
- Cardiology (47)
Case Study of GP

Patient GP presented initially to the Gramercy Pediatrics Weight Management Program at age 7.5 years old

- Obesity (BMI 33 >>99%)
- Attention Deficit Disorder
- Learning Disability
- Strong family history of obesity
- Mother had 2 metabolic surgeries.

Significant labs at first visit

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<thead>
<tr>
<th>Test Name</th>
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### What is her diagnosis and treatment?

- Prediabetes
- Hyperlipidemia
- Morbid obesity
- Dietary and lifestyle interventions
- Metformin 500 mg BID

### What is Metformin?

- A biguanide oral hypoglycemic agent
- Reduces weight, hyperinsulinemia, and hyperglycemia in adult patients with type 2 diabetes
- Inhibition of platelet aggregation antioxidant activity
- Positive effects on lipids (total cholesterol, HDL-C, low-density-lipoprotein cholesterol, triglycerides), and arterial hypertension
- In pediatrics, has a beneficial effect on weight, BMI, waist circumference, subcutaneous abdominal fat, fasting insulin, and fasting glucose

### How did she do on Metformin?

- Mother reported that she had terrible stomach aches with metformin
- Patient would not stay of metformin, even at a lower dose, for 2 weeks (250 mg BID)
- Patient lost to follow up for 5 years
Next follow up visit at 12 years old, during Covid 19 Pandemic

- BMI of 50
- Weight 129.2 kg (284.8 lb)

Comorbidities:
- Recurrent UTIs
- Urinary Incontinence
- Constipation
- Severe Asthma
- Behavioral issues, oppositional defiant, tantrums

Patient Progress

- Start Qsymia (phentermine/Topamax) appetite suppressant
  - Use is off label in children
- Patient was complaint with monthly office visits but having tantrums at home over healthy diet and exercise
  - Walked 1 mile each way to a donut shop to get "iced coffee" daily
  - Enrolled in cheerleading but refused to participate due to urinary incontinence
- Worsening UTIs and developed hydronephrosis
- Several asthma exacerbations requiring oral steroids
- Refer to Pediatric Psychiatrist because of worsening tantrums over food
Qsymia

• A combination of phentermine, a sympathomimetic amine anorectic, and topiramate extended-release, an antiepileptic drug

• Indicated as an adjunct to a reduced-calorie diet and increased physical activity for chronic weight management in adults with an initial BMI of 30 kg/m² or greater (obese) or 27 kg/m² or greater (overweight) in the presence of at least one weight-related comorbidity such as hypertension, type 2 diabetes mellitus, or dyslipidemia

https://www.drugs.com/qsymia.html

Patient Progress

• Lost 3.6 kg on Qsymia, but behavior was terrible
  • Threw a vacuum cleaner out the window at her mother

• Psychiatrist consulted and Qsymia discontinued due to behavior

• Child becomes severely depressed
  • Gains more weight
  • School refusal
  • Afterschool activity refusal
  • Developed hypertension

• Gained back 6.8 kg without Qsymia

• Patient agrees to try injectable weight loss drug

Glucagon Like Peptide 1 Analogues

• GLP-1 receptor agonists affect glucose control in the following ways:
  • Incretin mimetic
  • Enhancing of glucose-dependent insulin secretion
  • Slowing gastric emptying
  • Reducing postprandial glucagon and food intake
  • They do not cause hypoglycemia
  • May result in weight loss

Shaefer, Kushner, Agular (2015)
Glucagon Like Peptide 1 Analogues

• When blood sugar levels start to rise after someone eats, these drugs stimulate the body to secrete more insulin
  • The extra insulin helps lower blood sugar levels

• Side effects
  • Nausea
  • Vomiting
  • Diarrhea

• Contraindicated in patients with a personal or family history of Medullary Thyroid Carcinoma or Multiple Endocrine Neoplasia type 2
• Contraindicated in pregnancy

What GLP 1 Analogues Are Approved for weight loss in children?

• Saxenda: liraglutide 3 mg

  • For chronic weight management as an adjunct to a reduced-calorie diet and increased physical activity in adults with a BMI ≥30 kg/m², or ≥27 kg/m² with one or more weight-related comorbidities, and for patients aged 12-17 years with body weight above 60 kg (132 lbs) and an initial BMI corresponding to ≥30 kg/m² for adults by international cut-offs

  • Daily injection

Other GLP 1 receptor agonists, not yet approved for ages 12-17 y

• Trulicity (dulaglutide), weekly injectable drug
• Ozempic (semaglutide), weekly injectable drug

Some adolescent patients with obesity can use these drugs off label if their insurance pays for them.

Out of pocket costs without insurance range from $800-$900/month
Patient Progress

- Patient’s insurance covered Trulicity.
  - GP began to lose weight
  - GP began to walk 6,000-10,000 steps per day
  - GP developed persistent diarrhea on Trulicity

- Patient changed to Ozempic, which her insurance also covered
  - GP lost 21 pounds in 4 months
  - GP was still very depressed about her obesity
  - GP was referred to Columbia Presbyterian Metabolic Surgery Program:
    - Plan for gastric sleeve
    - Genetic testing for genes that cause obesity negative in GP and her mother

Recommended selection criteria for children and adolescents being considered for a bariatric procedure include:

- BMI 35 kg/m² or 120% of the 95th percentile for age and sex (whichever is lower) with serious medical conditions (type 2 diabetes, sleep apnea, idiopathic intracranial hypertension, or severe fatty liver disease).
- BMI 40 kg/m² or 140% of the 95th percentile for age and sex (whichever is lower).

Pre-metabolic surgery checklist

- Six-month weight loss program supervised by an obesity physician
- Meet pediatric surgical team and pediatric endocrinologist
- Upper Endoscopy
- EKG, stress test, Echocardiogram
- Chest X-ray
- Labs
- Meet with nutritionist
- Clearance by psychiatry

Bolling et al, (2019)
Patient's surgery cancelled and then approved

- GP was interviewed virtually by an adult psychiatrist assigned by insurance company.
- Psychiatrist did not clear patient for surgery due to ongoing depression, anxiety, and behavioral issues (4 days prior to surgery)
- Appeal made to insurance company by obesity medicine pediatrician
- Letter sent to insurance company with entire patient history
- Informed insurance company that depression and anxiety are the most common comorbidities in obesity
- Surgery approved

Post operative course

- GP lost 38.2 kg (84 lbs) in 9 months
- Unhappy that weight loss is not faster
- Now working out with trainer twice weekly
- Rejoined competitive cheerleading
- No medications, just a daily multivitamin

Comorbidities:
- Asthma-resolved
- UTIs-resolved
- Urinary Incontinence-resolved
- Behavioral issues-resolved
- Hyperlipidemia-resolved
- Prediabetes-resolved
- Hypertension-resolved

Significant labs at most recent visit

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Post-op management

• Vitamin D Deficiency
  • Vitamin D3 50,000 Units weekly started
  • Repeat labs in 1 month
  • Follow up via telehealth in 3 months

Conclusion

• Treatment of obesity in childhood requires a special skill set offered by pediatricians trained in obesity medicine
• Weight loss medications can help youth with obesity
• A multidisciplinary team is needed to treat children with morbid obesity
• Healthcare providers must be trained in the pre and post operative management of metabolic surgery in teens
• Metabolic surgery can reverse comorbidities of obesity in adolescents as it does in adults.

References

American Society for Metabolic and Bariatric Surgery (2022) Childhood and adolescent obesity https://asmbs.org/patients/adolescent-obesity