

MULTIDISCIPLINARY TREATMENT FOR OBESITY IN TEENS

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OBJECTIVES

- Summarize medical co-morbidities of obesity, including recommended screening in the SBHC setting
- Describe a multi-disciplinary approach that could be modified for SBHCs
- List approaches to improve adherence with lifestyle modifications

Screening:

What are we looking for?

- Type 2 Diabetes (T2D)*
- Pre-diabetes*
- Hypertension*
- Dyslipidemia/elevated cholesterol*
- Non-alcoholic fatty liver disease*
- Obstructive sleep apnea (OSA)*
- Gallbladder disease
- Polycystic ovarian syndrome (PCOS)
- Mental health issues
- Orthopedic problems

Screening for co-morbidities:

- **Obese (> 95% body mass index BMI)**
- **Overweight (> 85% BMI) with additional risk factors:**
 - **Family history of diabetes, high cholesterol, or early heart disease**
 - **Elevated blood pressure**

Laboratory screening

- Total cholesterol
 - Lipid panel if family history of heart disease
- A1c or fasting glucose
- ALT (alanine aminotransferase)
- Hematocrit for females

- Screen starting at puberty or age 10

Type 2 Diabetes (T2D)

Screening recommended if 2 or more risks:
FH diabetes, minority race, signs of insulin resistance

- Fasting plasma glucose (FPG) > 126 mg/dl
- HbA1c > 6.5%
- **Confirmation of results required unless the patient is clearly symptomatic**
- Screen patients every 2 years

Pre-diabetes

- Impaired fasting glucose (IFG)
 - Fasting plasma glucose (FPG) > 100 mg/dl < 126 mg/dl
- Impaired glucose tolerance (IGT)
 - 2-hour glucose > 140 mg/dl < 200 mg/dl
- HbA1c 5.7-6.4%
 - 5.7-5.9% unlikely to progress to diabetes within one year unless the patient gains a large amount of weight
 - 6.0-6.4% approximately 10% progress to diabetes in one year; BMI stabilization usually prevents progression

Management of pre-diabetes

- Focus on cutting down carbohydrates (especially sugar sweetened beverages)
- Exercise
- Maintenance of BMI associated with lower risk for progression to diabetes
- Frequency of lab follow-up depends on A1c level

Follow-up A1c testing

- 5.7-5.9: if BMI increasing (more than 0.5 kg/m² in 6 months) repeat in 6 months; Otherwise repeat in 1 year
- 6.0-6.4%: repeat in 3 months
- 6.5-7%: repeat within 1 week with UA for ketones
- > 7.0% call:
 - Barbara Davis Center if ketones are present
 - (303) 724-2323
 - CHCO endocrinology (Dr. Zeitler or Nadeau)
 - (720) 777-6128

Hypertension (HTN)

- Charts to determine 90% blood pressure for age, gender and height:
- http://www.nhlbi.nih.gov/guidelines/hypertension/child_tbl.pdf
- This is harder to determine in adolescents, rather than set normal values in adult patients
- More difficult diagnosis = less likely to be identified by providers

Definitions: HTN

- Pre-hypertension: BP $> 90\%$ but $< 95\%$, or $> 120/80$ (adult value)
- Hypertension: systolic blood pressure (SBP) or diastolic blood pressure (DBP) $> 95\%$ on 3 occasions confirmed with correct cuff size
 - Stage 1: 95% to $5 \text{ mmHg} > 99\%$
 - Stage 2: more than $5 \text{ mmHg} > 99\%$

Primary vs. Secondary HTN

Higher likelihood of secondary (caused by a specific medical problem) HTN:

- Pre-pubertal children
- Stage II hypertension
- Normal weight
- No family history of hypertension
- Abnormal symptoms or physical exam findings

HTN: lifestyle recommendations

- No added salt
- Avoid salty/processed foods (Ramen noodles, soups)
- Increased fruits/vegetables
- Increased low-fat dairy products
- Weight loss if indicated
- Aerobic exercise 60 minutes/day
- Avoid weight lifting
- No sports clearance for stage II HTN until controlled
- No smoking

Lipid screening

- All adolescents should be screened for dyslipidemia
- Lipid panels may be obtained non-fasting. Triglycerides are the component of the lipid panel most likely to be higher non-fasting
- Hypercholesterolemia is less likely to be affected by fasting status, so some people advocate for using total cholesterol as an initial screen

Diagnosis: hypercholesterolemia

- Mild:
 - Total cholesterol (TC) 170-199 mg/dl or
 - Low-density lipoprotein (LDL) 100-130 mg/dl
- Moderate:
 - TC 200-240 mg/dl or
 - LDL 130-160 mg/dl
- Severe (may be candidate for medications)
 - TC > 240 mg/dl or
 - LDL > 160 mg/dl

Dietary changes

- Eggs have a LOT of cholesterol so this is an easy target
- Limit whole milk, cheese, ice cream
- Trim fats from meats, use lean hamburger
- Limit fast foods

- Many families have NO idea what foods are high in cholesterol

When medication may be needed:

- LDL > 190 mg/dl with no risk factors
- LDL > 160 mg/dl with family history of early CV disease or T2D
- LDL > 130 mg/dl familial hypercholesterolemia
- LDL > 100 with type 1 or type 2 diabetes
- No improvement with 6 months of dietary change

Fatty Liver Disease

- NAFLD (non-alcoholic fatty liver disease) is a spectrum
- Fatty liver → NASH (non-alcoholic steatohepatitis) → fibrosis → cirrhosis and liver failure (2nd most common cause for liver transplant in adults)
- More common in Hispanics and males in adolescent patients
- Liver enzymes typically 1.5-3x the upper limits of normal
- Only steatosis detectable by US

NAFLD screening

- ALT (alanine aminotransferase) every 2 years for obese adolescents
- ALT above the upper limit of normal to 100 U/l check full liver panel in 1 year
- ALT > 100 check liver panel in 3 months
- If ALT persists > 100 for 6 months despite lifestyle change further evaluation is recommended

Obstructive Sleep Apnea (OSA)

- Snoring
- Sleepiness during the day
- Restless sleep
- Difficulty breathing
- Frequent waking from sleep
- Gasping for air or stopping breathing during sleep
- Mouth breathing
- Morning headaches
- Wetting the bed

OSA treatment

- Main options are tonsillectomy or CPAP (continuous positive airway pressure)
 - If tonsils are clearly enlarged, start with T & A
- Flonase can help shrink tonsils and adenoids
- Sleep study
 - AHI (apnea-hypopnea index): treatment varies by age of patient
 - Teens or adults often only treated if AHI < 15/hour if there are daytime symptoms

Treatment of obesity in adolescents

- First of all, halt weight gain
- Maintenance of weight is a very reasonable goal
- Studies in adults and teens have shown decreased incidence of T2D if weight gain is avoided.

Healthy Lifestyle Clinic

- Multi-disciplinary clinic at Denver Health
- Medical providers
- Dietician
- Health coaches
 - Telephone intervention available for 8 calls over 2-3 months
- Mental health therapists

Case #1 HLC

- 14 year old Hispanic male
 - BMI 28.7 kg/m² 7/13
 - ALT 144 U/l , A1c 6.2%
 - No chart documentation of abnormal labs
 - 1 year later: BMI 31 kg/m² 8/14
 - ALT 117 U/l, A1c 6.1%
 - Referred to HLC

Case 1 f/u

- 9/14 HLC #1 BMI 30.5 kg/m²
 - Met with dietician and health coach
 - Started telephone intervention
- 12/14 HLC #2 BMI 29.8 kg/m²
 - ALT down to 62 U/l; A1c 6.3%
 - Met with health coach
- 2/15 HLC #3 BMI 30.3 kg/m²
 - Significant conflict with mom over health eating
 - Met with therapist and health coach

Case #1, continued

- 3/15 HLC #4 BMI 29.6 kg/m² (down from 31)
 - A1c down to 5.6%
 - Parent and teen reporting resolution of conflicts (both were smiling)
 - Teen reports telephone intervention with the health coach very helpful

Lessons learned:

Different needs arise at different times

Ups and downs with weight are common

Modification for SBHCs

- Provider can play multiple roles: medical provider, dietician and health coach
 - The recommended dietary changes are not that complicated. You can do this!
 - Frequent contact is the key to success
 - Patient centered visits: ask if they want to return in 1 month, 2 months, 3 months
- SBHCs often have mental health personnel available
 - Screen for anxiety, depression, self –esteem issues, teasing or bullying due to weight

Types of lifestyle changes associated with weight loss

- Smaller portion sizes
- Decreased sugared beverages
- Decreased frequency of fast food
- Decreased snacking
- Breakfast
- Exercise 1 hour/day
- Decreased TV/computer time

References

- **National High Blood Pressure Education Program Working Group**
- **Blood pressure tables:
http://www.nhlbi.nih.gov/guidelines/hypertension/child_fbl.pdf**
- **Ritchie SK et al: Universal versus targeted blood cholesterol screening among youth: The CARDIAC project. Pediatrics. 2010 Aug;126(2):260-5**