Obesity Management in Type 2 Diabetes

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Disclosures

• No Financial Disclosures
Objectives

- Describe the importance of lifestyle management for diabetes mellitus control
- Identify how pharmacotherapies effect patient weight
- Demonstrate when to recommend metabolic surgery for patients with type 2 diabetes
- Identify High risk population groups

HBA1C of 8.6%

- 40 year old AA with BMI of 32
- 27 year old Asian American with BMI of 26
- 35 year old Hispanic with BMI of 43
- 65 year old Caucasian with BMI of 35
• Obesity is a major independent risk factor for developing diabetes, and more than 90% of type 2 diabetics are overweight or obese (WHO)
• African-Americans and the elderly are disproportionately affected by diabetes (NIDDK)
• The highest prevalence rates for obesity were seen in non-Hispanic black (56.6%) and Hispanic women (44.4%) (CDC)

• The most recent Centers for Disease Control and Prevention report shows that from 1980 to 2014, the age-adjusted incidence of diagnosed diabetes mellitus nearly doubled from 3.5 to 6.6 per 1000 population, and increases were seen in both sexes.
• If present trends continue, it is estimated that 1 in 3 Americans will have diabetes mellitus by 2050.
• Of particular concern is the high prevalence of diabetes mellitus among Asians who despite having a lower BMI are 30% to 50% more likely to develop diabetes mellitus than their white counterparts.
• In fact, prospective data from Kaiser Permanente confirm that Pacific Islanders, South Asians, and Filipinos have the highest prevalence (18.3%, 15.9%, and 16.1%, respectively) of diabetes mellitus among all racial/ethnic groups, including minorities traditionally considered high risk such as black, Latinos, and Native Americans.
Age-adjusted incidence of diagnosed diabetes among adults aged ≥18 years, United States, 2013–2015 (ADA)

(Characteristic Rate per 1,000 (95% CI) Race/Ethnicity)

- Asian, non-Hispanic 6.0 (4.2–8.6)
- Black, non-Hispanic 9.0 (7.4–10.9)
- Hispanic 8.4 (7.2–9.8)
- White, non-Hispanic 5.7 (5.0–6.4)

The rates of diagnosed diabetes in adults by race/ethnic background are:
- 7.4% of non-Hispanic whites (76% of US population)
- 8.0% of Asian Americans (6% of the US population)
- 12.1% of Hispanics (18% of the US population)
- 12.7% of non-Hispanic blacks (14% of US population)
- 15.1% of American Indians/Alaskan Natives (13.5% US population)

The breakdown among Asian Americans:
- 4.3% for Chinese
- 8.9% for Filipinos
- 11.2% for Asian Indians
- 8.5% for other Asian Americans.

The breakdown among Hispanic adults:
- 8.5% for Central and South Americans
- 9.0% for Cubans
- 13.8% for Mexican Americans
- 12.0% for Puerto Ricans.
How are Asians Different?

• Asians develop metabolic abnormalities at lower BMI and waist circumference cut off.
  • A genetic predisposition at smaller body sizes and lower BMI levels
  • Higher percentages of central adiposity in the presence of a lower BMI
  • Difference in body fat composition
  • Role of Lipoprotein (a) and C reactive protein levels is variable
  • Increased risk of developing metabolic syndrome and diabetes, even at lower BMI levels

• Conventional criteria (put forth by NCEP, ATP III and WHO) may underestimate the prevalence of metabolic syndrome by 25-50% and may be inadequate to identify Asians at risk for morbidity.

Outline

Lifestyle
  • Medical Nutrition Therapy
  • Physical activity
Medications
Metabolic Surgery

The Foundation of Hyperglycemic Management
Benefits of Weight Loss

- Delay progression from prediabetes to type 2 diabetes
- Positive impact on glycemia in type 2 diabetes
  - Most likely to occur early in disease development
- Clinically meaningful reductions in triglycerides, BP, LDL and HDL
- Reduction in need for medications to control BG, BP and lipids


Recommendations: Assessment

- At each patient encounter, BMI should be calculated and documented in the medical record. B
  - BMI should be:
    - Classified to determine the presence of overweight or obesity
    - Discussed with the patient
    - Documented in the patient record
  - Remember that BMI cut points for Asian Americans are lower than in other populations

**Change is Needed on Addressing Obesity among Asian Americans**

WHO and IDF have proposed modified criteria for classification of overweight/obesity amongst Asians

<table>
<thead>
<tr>
<th>Category</th>
<th>WHO Definition</th>
<th>WHO Modified definition (Asians)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMI</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>18.5 - 24.9</td>
<td>Acceptable</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0 - 29.9</td>
<td>Increased</td>
</tr>
<tr>
<td>Obese</td>
<td>≥ 30</td>
<td>Higher high</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WC (waist circumference)</th>
<th>NCEP ATP III</th>
<th>IDF (Asians)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male ≥102 cm (40 in)</td>
<td>Males ≥ 90 cm (35 in)</td>
<td></td>
</tr>
<tr>
<td>Female ≥ 88 cm (35 in)</td>
<td>Females ≥ 80 cm (31 in)</td>
<td></td>
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</tbody>
</table>

**Overweight/Obesity Treatment Options in T2DM**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Body Mass Index (BMI) Category (kg/m²)</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>25.0-26.9 (or 23.0-26.9*)</td>
<td>27.0-29.9</td>
</tr>
<tr>
<td>Diet, physical activity &amp; behavioral therapy</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Pharmacotherapy</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Metabolic surgery</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

* Cutoff points for Asian-American individuals.

X Treatment may be indicated for selected, motivated patients.

Diet, Physical Activity, Behavioral Therapy Interventions:

- Designed to achieve and maintain >5% weight loss should be prescribed for overweight and obese patients ready to achieve weight loss. A
- High-intensity (≥16 sessions in 6 months) and designed to achieve a 500 - 750 kcal/day energy deficit. A
Recommendations: Diet

- **Individualize** dietary recommendations!
- Address individual nutrition needs based on
  - Personal and cultural preferences
  - Health literacy and numeracy
  - Access to healthful foods
  - Willingness/ability to make behavioral changes
  - Barriers to change


Individualizing Care

- Calorie restriction is the goal
- Changes to amount of carbohydrate, fat or protein in dietary intake are equally effective and based on individual preferences and health status
- Refer to a registered dietitian
Encouragement: Quick Tips

• Stress the value of losing a small amount of weight
• Assess patient’s current eating patterns and physical activity
• Find out what patient thinks needs to change in order to lose weight
• Eat less, move more
• Plan ahead: parties, traveling, other activities outside normal routine
• Ask “Are there swaps you can make to reduce calories?”
  – Popcorn instead of potato chips

Lifestyle Intervention Programs

For patients who achieve short-term weight loss goals, long-term (≥1 year) comprehensive weight maintenance programs should be prescribed.

– at least monthly contact
– encourage ongoing monitoring of body weight (weekly or more frequently) and/or other self-monitoring strategies, such as tracking intake, steps, etc.
– continued consumption of a reduced-calorie diet
• participation in high levels of physical activity (200-300 min/week).

To achieve weight loss of >5%, short-term (3-month) interventions that use very-low-calorie diets (≤800 kcal/day) and total meal replacements may be prescribed

- for carefully selected patients
- by trained practitioners in medical care settings
- with close medical monitoring

• To maintain weight loss, such programs must incorporate long-term comprehensive weight maintenance counseling. B

Pharmacotherapy

• Weight loss medication may be effective for selected patients with T2DM and BMI $\geq 27$ kg/m$^2$.

• When choosing glucose-lowering meds for overweight or obese patients with T2DM, consider effect on weight. E

• Whenever possible, minimize the meds for comorbid conditions that are associated with weight gain. E

• Potential benefits must be weighed against the potential risks of the weight loss medications. A

Discontinuing Medication

• If patient’s response to weight loss medications is $<5\%$ weight loss after 3 months

• If there are any safety or tolerability issues at any time

• Then, alternative medication(s) or treatment approaches should be considered. A
### FDA-Approved Medications for Treatment of Obesity

#### Table 8.3—Medications approved by the FDA for the treatment of obesity

<table>
<thead>
<tr>
<th>Medication name</th>
<th>Typical adult maintenance dose</th>
<th>Average wholesale price (30-day supply) [100]</th>
<th>National Average Drug Acquisition Cost (30-day supply) [100]</th>
<th>1-Year (52- or 56-week) mean weight loss [% loss from baseline]</th>
<th>Weight loss [% loss from baseline]</th>
<th>Common side effects</th>
<th>Possible safety concerns/considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short-term treatment (5-12 weeks)</strong></td>
<td></td>
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</tr>
<tr>
<td>Phenformin (108)</td>
<td>8–37.5 mg q.d.*</td>
<td>$55–$56 (37.5 mg dose)</td>
<td>$4 (37.5 mg dose)</td>
<td>15 mg q.d.</td>
<td>7.5 mg q.d.</td>
<td>PIQO</td>
<td>6.1</td>
</tr>
<tr>
<td>Lipase inhibitor</td>
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</tr>
<tr>
<td>Orlistat (3)</td>
<td>60 mg t.i.d. (OTC)</td>
<td>$41–$58.7</td>
<td>$42</td>
<td>120 mg t.i.d. (Rx)</td>
<td>$55.6</td>
<td>PIQO</td>
<td>9.6</td>
</tr>
<tr>
<td>Selective serotonin (5-HT)<del>2</del>C receptor agonist</td>
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<td></td>
<td></td>
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<tr>
<td>Lorcaserin (148)</td>
<td>10 mg b.i.d.</td>
<td>$318</td>
<td>$255</td>
<td>10 mg b.i.d.</td>
<td>PIQO</td>
<td>4.5</td>
<td>1.5</td>
</tr>
</tbody>
</table>

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### FDA-Approved Medications for Treatment of Obesity

#### Sympathomimetic amine amphetamine/antiepileptic combination

- **Phentermine/Topiramate ER (109)**
  - 7.5 mg/46 mg q.d.
  - $223 (7.5 mg/46 mg dose)
  - $178 (7.5 mg/46 mg dose)
  - 15 mg/92 mg q.d.
  - 7.5 mg/60 mg q.d.
  - PIQO
  - 9.8
  - 7.8
  - Constipation, paresthesia, insomnia, nasopharyngitis, somnolence
  - • Birth defects
  - • Cognitive impairment
  - • Acute angle-closure glaucoma

#### Opioid antagonist/antidepressant combination

- **Naltrexone/Atomoxetine ER (13)**
  - 8 mg/50 mg, 2 tablets b.i.d.
  - $334
  - $267
  - 16 mg/180 mg b.i.d.
  - PIQO
  - 5.0
  - 1.8
  - Constipation, nausea, headache, somnolence
  - • Contraindicated in patients with uncontrolled hypertension and/or seizure disorders
  - • Contraindicated for use with chronic opioid therapy
  - • Acute angle-closure glaucoma
  - • Black box warning:
    - • Risk of suicidal behavior/ideation

#### Glucagon-like peptide 1 receptor antagonist

- **Liraglutide (16)**
  - 3 mg q.d.
  - $1,441
  - $1,154
  - 3.0 mg q.d.
  - 1.8 mg q.d.
  - PIQO
  - 0.0
  - 4.7
  - 2.0
  - Hypoglycemia, constipation, nausea, headache, indigestion
  - • Acute pancreatitis
  - • Black box warning:
    - • Risk of thyroid C-cell tumors
    - • Contraindicated with personal or family history of MTC or MEN 2

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All medications are contraindicated in women who are or may become pregnant. Women of reproductive potential must be counseled regarding the use of reliable methods of contraception. Select safety and side effect information is provided; for a comprehensive discussion of safety considerations, please refer to the prescribing information for each agent. B.i.d., twice daily; ER, extended release; MEN 2, multiple endocrine neoplasia syndrome type 2; MTC, medullary thyroid carcinoma; OTC, over the counter; PIQO, placebo; q.d., daily; Rx, prescription; t.i.d., three times daily; XR, extended release.

*Use lowest effective dose; maximum appropriate dose is 37.5 mg. Duration of treatment was 28 weeks in a general obese adult population. Eligible participants had normal (75%) or impaired (25%) glucose tolerance. Maximum dose, depending on response, is 15 mg/92 mg q.d. Approximately 88% of enrolled participants had type 2 diabetes or impaired glucose tolerance.
**METABOLIC SURGERY**

**Summary**

Lifestyle is the foundation*
- Highly effective in motivated, adherent patients

Medications
- Lots of choices
- We hope to make it easier to navigate them
- Safety, efficacy, cost and convenience

Metabolic surgery*
- Consider it as very effective salvage therapy

*The only choices that can lead to disease remission
Medical Devices for Weight Loss

• Several minimally invasive medical devices have been recently approved by the FDA for short-term weight loss
• It remains to be seen how these are used for obesity treatment
• Given high cost, extremely limited insurance coverage, and paucity of data in people with diabetes at this time, these are not considered to be the standard of care for obesity management in people with type 2 diabetes at this time

Sullivan S. Diabetes Spectr 2017;30:258–264

Metabolic Surgery

• Evidence supports gastrointestinal (GI) surgery as effective treatments for overweight T2DM patients.
• Randomized controlled trials with postoperative follow-up ranging from 1 to 5 years have documented sustained diabetes remission in 30–63% of patients, though erosion of remission occurs in 35-50% or more.

Metabolic Surgery

• With or without diabetes relapse, the majority of patients who undergo surgery maintain substantial improvement of glycemic control for at least 5 to 15 years with a median of 8.3 years with Roux-en-Y gastric bypass.

• People who undergo metabolic surgery should be evaluated to assess the need for ongoing mental health services to help them adjust to medical and psychosocial changes after surgery. C


Metabolic Surgery

• Should be recommended as option to treat T2DM in appropriate surgical candidates with BMI >40 kg/m² (37.5*), and in adults with BMIs 35.0-39.9 kg/m² (32.5-37.4*) who do not achieve durable weight loss and improvement in co-morbidities (including hyperglycemia) with reasonable nonsurgical methods. A

• May be considered as option for adults with T2DM and BMI 30-34.9 kg/m² (27.5-32.4*) who do not achieve durable weight loss and improvement in co-morbidities (including hyperglycemia) with reasonable nonsurgical methods. A
Metabolic Surgery

- Metabolic surgery should be performed in high-volume centers with multidisciplinary teams that understand and are experienced in the management of diabetes and gastrointestinal surgery. C

- Long-term lifestyle support and routine monitoring of micronutrient and nutritional status must be provided after surgery, according to guidelines for postoperative management of metabolic surgery by national and international professional societies. C

- People presenting for metabolic surgery should receive a comprehensive readiness and mental health assessment. B
Metabolic Surgery

- People who undergo metabolic surgery should be evaluated to assess the need for ongoing mental health services to help them adjust to medical and psychosocial changes after surgery. C
- Surgery should be postponed in patients with alcohol or substance abuse disorders, significant depression, suicidal ideation, or other mental health conditions until these conditions have been fully addressed.

Metabolic Surgery-Adverse Effects

- Mortality rates typically 0.1%-0.5%, similar to cholecystectomy or hysterectomy
- Morbidity has dramatically declined with laparoscopic approaches
- Major complication rates compare favorably to other elective operations (i.e., deep venous thrombosis)
- Long term- dumping syndrome, vitamin and mineral deficiencies, anemia, osteoporosis, hypoglycemia
Metabolic Surgery: Adverse Effects

- Costly, but may be cost-effective long term
- Patients undergoing metabolic surgery may be at higher risk for depression, substance abuse, and other psychosocial issues

Putting into Practice

Check your patients lifestyle perceptions
Example: Skipping meals can help you lose weight faster
True or False

False: Skipping meals makes your body less efficient and is likely to cause increased hunger and result in poor food choices.
Pop Quiz

When addressing nutritional needs for an overweight or obese patient with diabetes:

A. Consider cultural and personal preferences
B. Put the patient on a low carb diet
C.Prescribe the Official ADA diet
D. Focus solely on total fat consumption

Diabetes Self-Management Education

- Find a recognized Diabetes Self-Management and Support program service
- Become a recognized provider of DSME/S
- Tools and resources for DSMES
- Online education documentation tools

Professional.Diabetes.org/ERP
ADA Nutrition Tool

- Digital and recipe destination
- Innovative meal planning
- Shopping list tools
- Expert cooking tips and tricks

DiabetesFoodHub.org

Resources

- http://aapiusa.org
- http://aadi.joslin.org
- www.hopecho.org
- http://www.lakheir.org/index.html
Thank You!