Screening and Diagnosis of Diabetes

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Disclosures

• PI/SubPI on many clinical trials at Altru Health System, Grand Forks, ND
• Speakers Bureau Novo Nordisk
• Speakers Bureau Medtronic
• Advisory Board Sanofi
• Advisory Board Novo Nordisk
• American Diabetes Association speaker
• I have type 1 diabetes and use insulin
Objectives

- Overview of diabetes
- Understand appropriate screening for and diagnosis of diabetes
- Know different types of diabetes
- Incorporate referral for diabetes prevention into practice

Diabetes In America

- 30 million have diabetes (about 90% are type 2)
- Expect about 1/3 of population to have diabetes by 2050
- Over a million new cases per year
- 86 million have prediabetes
- Racial/ethnic/geographic disparities

CDC
Diabetes in North Dakota

• Over 200,000 people in North Dakota have prediabetes, many probably don’t know they have it
• About 55,000-65,000 people in North Dakota have diabetes 8-11% of the population
• Direct Medical Costs $455 million

American Diabetes Association
North Dakota Diabetes Prevention and Control Program
http://www.diabetesnd.org/

Diabetes Mellitus

• Type 1: Usually younger, insulin at diagnosis
• Type 2: Usually older, often oral agents at diagnosis
• Type “1.5” (Latent Autoimmune) mixed features ~10% of type 2
• Gestational: Diabetes of Pregnancy
Diabetes Risk and Prevention

Risk:
• Type 1 - mostly unknown, some familial
• Type 2 - obesity, smoking, sedentary lifestyle, familial

Prevention:
• Type 1 - none known
• Type 2 - lifestyle management

Diabetes Guideline Management

• 2 main sets of guidelines utilized in U.S.
• American Diabetes Association (ADA)
• American Association of Clinical Endocrinology (AACE)
• Lots of overlap, AACE considered “more intense”
Avoiding Diabetes Complications

• Blood glucose control A1C <7%
• Treat Lipids with appropriately dosed statin based on risk and age
• Treat blood pressure to target <140/<90
• Don’t get diabetes
• Appropriate Lifestyle Intervention

For most non-pregnant adults

American Diabetes Association 2017

Screening For Diabetes
Risk factors for Prediabetes and T2D

- A1C ≥5.7% (39 mmol/mol), IGT, or IFG on previous testing
- first-degree relative with diabetes
- high-risk race/ethnicity (e.g., African American, Latino, Native American, Asian American, Pacific Islander)
- women who were diagnosed with GDM
- history of CVD
- hypertension (≥140/90 mmHg or on therapy for hypertension)
- HDL cholesterol level <35 mg/dL (0.90 mmol/L) and/or a triglyceride level >250 mg/dL (2.82 mmol/L)
- women with polycystic ovary syndrome
- physical inactivity
- other clinical conditions associated with insulin resistance (e.g., severe obesity, acanthosis nigricans).

https://diabetes.org/diabetes-risk

Screening For Diabetes

- A1C or FPG or 75 g oral GTT
- Testing should be considered in all adults who are overweight (BMI ≥25 kg/m2) and who have one or more additional risk factors for diabetes
- Everyone starting at age 45
- Diabetes Risk Test
Type 2 Diabetes Screening in Children/Adolescents

- Overweight
  - BMI >85th percentile
  - weight for height >85th percentile
  - weight >120% of ideal for height

- Plus similar risk factors for adults

Diabetes Diagnosis

<table>
<thead>
<tr>
<th>Category</th>
<th>FPG (mg/dL)</th>
<th>2h 75gOGTT</th>
<th>A1C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;100</td>
<td>&lt;140</td>
<td>&lt;5.7</td>
</tr>
<tr>
<td>Prediabetes</td>
<td>100-125</td>
<td>140-199</td>
<td>5.7-6.4</td>
</tr>
<tr>
<td>Diabetes</td>
<td>&gt;126**</td>
<td>&gt;200</td>
<td>&gt;6.5</td>
</tr>
</tbody>
</table>

Or patients with classic hyperglycemic symptoms with plasma glucose ≥200

** On 2 separate occasions

Diabetes Care 41 :Supplement 1, 2014
Type 1 Diagnosis

• Usually very symptomatic
• Weight loss, polyuria, polydipsia
• May seem flu-like
• Often significant blood glucose elevation
• Blood and urine ketones
• Not necessarily young

Gestational Diabetes (GDM)

• Screen for type 2 diabetes first prenatal visit if risk factors
• Not known to have diabetes, screen for GDM at 24 –28 weeks of gestation
• Screen women with GDM for persistent diabetes 6–12 weeks postpartum
  – (A1C not recommended here, as treated in pregnancy)
• Women with a history of GDM lifelong screening for diabetes
  – (up to 7x higher risk than non-GDM)
• 1 step or 2 step testing

Diabetes Care 2019 Jan; 42 (1)
Gestational Diabetes and Type 2 Diabetes Risk

• Gestational Diabetes should be considered a pre-diabetes condition
• Women with gestational diabetes have a 7-fold future risk of type 2 diabetes vs. women with normoglycemic pregnancy
• 35-60% go on to have DM


Why Is Prediabetes Important?

• Almost 80 million people have prediabetes
• Blood sugars are abnormal, but not high enough to be diagnosed with diabetes
• Lifestyle can prevent over half of prediabetes cases converting to type 2 diabetes (and the complications that go with it!)
• 150 minutes of exercise/week, weight loss of 5-7%
Evidence Supporting Diabetes Prevention

- Finnish Diabetes Prevention Study (DPS)

- Diabetes Prevention Program (DPP)
  N Engl J Med 2002; 346:393-403

Diabetes Prevention Program

- Community based or health system based, some employers
- Find DPP in your area here:
  http://www.diabetesnd.org/diabetes-prevention/
Medications for Diabetes Prevention

• Metformin is only indicated medication
• Metformin therapy for prevention of type 2 diabetes should be considered in those with:
  • Prediabetes, especially for those with BMI $\geq$ 35 kg/m²
  • <60 years of age
  • Women with prior gestational diabetes mellitus

Diabetes Care 2019 Jan; 42(Supplement 1): S1-S2.

Case

• 33 y/o female with GDM in 2nd pregnancy (diagnosed with 2 step method), healthy baby boy 10 lbs 2 oz
• BMI 29
• Normoglycemic (blood glucose 90) at 6 week post-partum check
• Now what?
Case

• GDM is a prediabetes condition
• Needs at least annual followup
• Women diagnosed with GDM should receive lifelong screening for prediabetes and type 2 diabetes

Diabetes Care 2019 Jan; 42(Supplement 1): S1-S2.

Case

• Lost to followup
• Seen 3 years later for annual exam
• BMI 33
• Fasting blood glucose 118

Now what?
Case

• This patient has prediabetes
• Should have a discussion and referral to a diabetes prevention program
• Could consider metformin

Summary

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