

Taking Charge of Diabetes

A Patient's Guide to Managing Risk Factors and Complications of Type 2 Diabetes

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Prevalence of Diabetes

- According to the American Diabetes Association, 7.8% of the U.S. population has diabetes
- The number of people with diabetes increases with age:
 - 10.7% people over the age of 20 have diabetes
 - 23.1% people over the age of 60 have diabetes

What happens in Diabetes?

- Insulin is the hormone necessary for helping the body to absorb sugar from the bloodstream
- In type 2 diabetes, there are two problems causing the blood sugar to run high:
 - Early in the disease, the body’s tissue does not respond as well as it should to the insulin it sees. In other words, the body becomes “resistant” to the effects of the insulin
 - As the disease progresses, the body actually starts to make less insulin, making the patient relatively insulin “deficient”.

Symptoms of Diabetes

- Feeling thirsty all the time
- Needing to urinate frequently
- Blurry vision
- Increased hunger
- Unexplained weight loss
- Numbness of the hands and feet
- Dry mouth

Risk Factors

- 1) Family history, especially in a first degree relative
- 2) Obesity/overweight
- 3) Increasing age
- 4) Lack of exercise/certain eating patterns
- 5) Certain racial and ethnic groups; e.g. Non-Hispanic Blacks, Asian Americans and Pacific Islanders, American Indians, Alaska natives
- 6) Metabolic Syndrome/history of glucose intolerance
- 7) Women who have had gestational diabetes or who have had a baby weighing over 9 pounds at birth

Modifiable Risk Factors

- Weight
- Metabolic Syndrome
- Diet and Exercise

Weight

40% Americans are overweight!

Overweight: refers to a weight above the “normal” range

Obesity: refers to presence of excess body fat

Body Mass Index (BMI) = weight (kg)/height (meters squared)

BMI between 25-30: overweight

BMI over 30: obese

Metabolic Syndrome

- Characterized by abdominal obesity, hyperglycemia, dyslipidemia, and hypertension
- Prevalence is steadily increasing and is strongly associated with increasing BMIs. It is seen in:
 - **5%** of people at **normal weight**
 - **22%** of **overweight** people (BMI 25-30)
 - **60%** of **obese** people (BMI over 30)

Metabolic Syndrome

- 2001 National Cholesterol Education Program/ATP III Criteria (Presence of any 3 of the following):
 - 1) Abdominal obesity, defined as waist circumference in men over 40 inches, women over 35 inches
 - 2) Serum triglycerides greater than 150 mg/dL
 - 3) Serum HDL less than 40 (men) or less than 50 (women)
 - 4) Blood pressure greater than 130/85
 - 5) Fasting plasma glucose greater than 100 mg/d

Metabolic Syndrome

What does it mean?

- Excess fat, particularly abdominal obesity, leads to insulin resistance (the way the body uses and metabolizes glucose and fatty acids)
- Insulin resistance, in turn, causes higher insulin levels and increased sugar levels
- Higher insulin and sugar then causes problems within the blood vessels, higher lipids, higher blood pressure, and vascular inflammation

Metabolic Syndrome

- The vascular changes seen in the metabolic syndrome are strongly associated with subsequent development of diabetes and cardiovascular disease
- Other diseases associated with the metabolic syndrome include: fatty liver, chronic kidney disease, polycystic ovaries, obstructive sleep apnea, and gout

Diet and Exercise

- Modifying your diet and exercise habits can lead to:
 - Lower weight
 - Smaller abdominal girth
 - Lower blood pressure
 - Improved triglycerides and cholesterol

Carbohydrates

- **Carbohydrates**

- There is much interest and many ongoing studies re-examining our thoughts towards carbohydrates
- Many believe the obesity epidemic has been caused in large part by our shift towards consuming more carbohydrates, particularly those with high glycemic loads
- The concept of simple versus complex carbohydrates is now being replaced by the GI (glycemic index) and GL (glycemic load) of various carbohydrates.

Carbohydrates

- **Glycemic Index:**
 - In vivo measurement of the relative impact of carbohydrate-containing foods on blood glucose
- **Glycemic Load:**
 - Product of the GI value of a food and its carbohydrate content (i.e. it factors in both the quantity and the quality of the carbohydrate consumed)

Carbohydrates

- Foods with a high GI/GL cause higher rises in blood glucose, insulin, and triglyceride concentrations, and lower the high-density lipoprotein (HDL) cholesterol

Carbohydrates

- In general, foods with a high GI/GL include potatoes, refined cereal products, sugar-sweetened beverages
- High fructose corn syrup sweeteners have become the leading sweetener in the US food industry
- Duration of post-meal satiety is generally related to postprandial glycemia

Carbohydrates

- **Foods with low GI/GL include whole grains, fruits and vegetables with high fiber content**
- **General goals:**
 - 1) **Decrease** the total amount of carbohydrates consumed
 - 2) **Replace** carbohydrates with protein and mono- and polyunsaturated fats
 - 3) **Avoid** foods highly processed/refined carbohydrates with high GI's
 - 4) www.glycemicindex.com

Eating Habits- Frequency

- Eating more frequently, but smaller amounts, leads to more stable insulin levels and less weight gain
- Large infrequent meals lead to larger releases of insulin, which, in turn, promote the development of fat cells
- Going long periods without eating also tends to slow the metabolism. The body thinks it is in a state of famine and reacts by conserving energy

Exercise

Effects of regular exercise on the body:

- Improved blood sugar control/decreased insulin resistance
- Decreased triglycerides and increased HDL
- Lowered blood pressure
- Decreased abdominal fat
- Decreased risk of heart disease
- Improved strength and balance

Exercise Goals

- Initially aim for **20-30 minutes of moderate exercise, 5-7 days per week**
- Build up to **30-60 minutes of daily moderate-vigorous exercise**
- Can be broken up into smaller increments of time
- **One is never too old to begin!!**

Diagnosis of Diabetes

21

- Random blood sugar greater than 200
- Fasting sugar greater than 126
- Hemoglobin A1c greater than 6.5%
- Abnormal glucose tolerance test

Complications of Diabetes

- 1) Heart disease and Stroke: risk increases 2-4 times for patients with diabetes
- 2) Blindness: diabetes is the leading cause of blindness in patients 20-74 years old
- 3) Kidney disease: diabetes is the leading cause of kidney failure
- 4) Neuropathy: 60-70% patients with diabetes have nerve damage
- 5) Amputation: over 60% non-traumatic lower limb amputations occur in people with diabetes

Medications

- Metformin
- Sulfonylureas (e.g. glipizide, glyburide)
- Metiglitinides (e.g. prandin, starlix)
- Thiazolidinediones (e.g. actos)
- Sitigliptin (januvia)
- Insulin
- Alpha-glucosidase inhibitors
- Glucagon-like peptide 1 agonists

Managing Diabetes

Hemoglobin A1c

- Gives an average blood sugar for preceding 2-3 months
- Goal: generally less than 7%
- Should be checked every 3-6 months, depending on medications and results

Managing Diabetes

- **Blood pressure:** goal is less than 135/80
- **Lipid goals:**
 - Total: below 200
 - LDL: below 100 (ideally closer to 70)
 - HDL: above 40 in men, above 50 in women
 - Triglycerides: below 150

Managing Diabetes

- Kidney: blood test for kidney function plus urine for protein (microalbumin)
- Eye: Annual dilated eye exam
- Feet: Daily cleaning, trimming, inspection. Visits to the podiatrist when indicated.
- Teeth: regular dental visits
- Quit smoking!!

SUMMARY

- Diet: Manage your carbohydrate intake, make healthy choices, eat frequently, and drink plenty of water
- Exercise daily
- Take medications as prescribed
- Monitor your blood sugars as directed by your physician
- Know your numbers: BMI, A1c, BP, lipids

CONCLUSION

QUESTIONS??