
Dakota Diabetes Coalition is proud to offer this column on diabetes and related concerns every other Friday.



Dr. Johnson is a family practice doctor in Grand Forks with a special interest in diabetes -- and a special knack for writing. As a member of the Dakota Diabetes Coalition, he has generously made himself available to answer questions through our listserv. If you have comments, or questions for Dr. Johnson to address in future columns, please contact gailhand@q.com



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Meet 'M.G.'

Diabetes Case Study

M.G. is a 58 y/o white female who presents to her primary care physician with a complaint of "tired all the time." It's been going on for several months, and she doesn't report any concerns with nighttime sleep. She doesn't note any new stress or other life changes, and denies depression or anxiety. Alcohol consumption is limited to one to two drinks per week, and she quit smoking over 10 years ago.

Family history is notable for type 2 diabetes in an older sister; her mother had hypothyroidism and "heart disease." The patient also has high cholesterol that she has been trying to treat with "weight loss and exercise." She walks about 20 minutes three times weekly when the weather allows. She has been treated for about five years for hypertension with hydrochlorothiazide.

The pertinent findings on physical exam:

Height: 5'4"

Weight: 212 lbs.

BMI: 36

BP: 135/86

Heart/Lungs: Normal exam

Abdomen: Obese and benign
No thyromegaly
Vision and optic fundi: normal
Feet: normal
Remainder unremarkable

Risk factors for development of diabetes?

Yes. Her risk factors include hypertension, dyslipidemia (cholesterol disease), obesity, family history of type 2 diabetes, and cigarette smoking, which is an independent risk factor for the development of type 2 diabetes.

What labs would you order for this patient?

Typically, for a patient with this complaint and history, type 2 diabetes would be considered. **Anemia and hypothyroidism** would be other possibilities in a differential of common diagnosis.

In this case, complete blood count and TSH were normal. Other blood chemistries, including kidney and liver function tests were normal. Casual blood glucose (random) was 210. She was brought back for a fasting glucose 2 days later, which was 129.

Does this patient have diabetes?

The answer is most likely. A casual blood glucose of >200 can be used for diagnosis if the patient has classic symptoms of diabetes or hyperglycemia, such as polyuria, polydipsia, weight loss. The patient does report fatigue, likely due to hyperglycemia. A fasting blood glucose value of ≥ 126 is also very suggestive. Classically, this patient would need another fasting blood glucose value of ≥ 126 for diagnosis. In this case, that was done one week later, and the patient's fasting glucose was 138, giving her a diagnosis of type 2 diabetes. An A1C was also drawn at that time, which was 7.6%. A1C is not yet recommended for diabetes diagnosis, although that could change in the future.

The current diagnostic criteria for Diabetes Mellitus from the American Diabetes Association are listed below:

FPG ≥ 126 mg/dl (7.0 mmol/l). Fasting is defined as no caloric intake for at least 8 hours.*

OR

Symptoms of hyperglycemia and a casual plasma glucose ≥ 200 mg/dl (11.1 mmol/l).

Casual is defined as any time of day without regard to time since last meal. The classic symptoms of hyperglycemia include polyuria, polydipsia, and unexplained weight loss.

OR

2-hour plasma glucose ≥ 200 mg/dl (11.1 mmol/l) during an OGTT. The test should be performed as described by the World Health Organization, using a glucose load containing the equivalent of 75 g anhydrous glucose dissolved in water.*

Three ways to diagnose diabetes are possible, and each, in the absence of unequivocal hyperglycemia, must be confirmed, on a subsequent day, by any one of the three methods given.

How should this patient be treated?

Current ADA guidelines state that this patient should be started on Metformin at diagnosis, and see a dietitian and diabetes educator for guidance on a meal plan, as well as instruction to monitor her blood glucose on a home monitor. Former guidelines suggested a period of lifestyle management before committing to medication. Metformin is currently recommended as initial therapy unless the individual patient has a contraindication, such as liver disease, kidney disease or congestive heart failure. This recommendation stems from two lines of reasoning: 1) Many patients fail on the lifestyle measures alone, and 2) Patients on metformin in the UKPDS trial had better outcomes.

Individuals **over age 80 are not good metformin candidates** due to their likely age-related decline in kidney function. Many elderly patients are better served with a single injection of basal insulin for their diabetes therapy.

A target A1C of $< 7\%$ is still recommended for most non-pregnant adults with diabetes.

Additionally, this patient will need her cholesterol status re-evaluated and likely treated with a statin agent. She has established hypertension that does not meet the target of $< 130 / < 80$ for a person

with diabetes. ACE inhibitors or ARB drugs are first line options for hypertension treatment in diabetes. A very cost effective way to manage this patient would be to place her on a combination ACE/thiazide diuretic. As she is over age 35, she should be started on low dose daily aspirin therapy, usually 81 mg daily, unless she has a contraindication to aspirin.

How will this patient's needs change over time?

This patient should have close follow-up initially, and eventually be seen on an every 3 to 6 month schedule, with appropriate lab follow-up. She will need a dilated eye examination shortly after diagnosis, and at least every year thereafter.

Patients with type 2 diabetes typically have significant exhaustion of insulin producing beta cells at diagnosis. As much as 50% of these cells will be suppressed or non-functioning, compounding the problem brought on by the insulin resistance process.

Over time, these patients will have further decline in their own pancreas insulin production, and will eventually need insulin replacement. Other oral agents may be worthwhile early in the course of type 2 diabetes, but by 7-8 years after diagnosis, many, if not most, of these patients will need insulin therapy.

A once daily basal insulin strategy is usually the easy, safe, and effective treatment for these patients to introduce them to insulin therapy. Most will eventually need mealtime rapid acting (bolus) insulin with meals, but this is not necessarily a difficult task once patients have achieved confidence with their insulin use.

Step-wise, guideline directed diagnosis and treatment is a logical and easy way to manage this complex condition. Additionally, management of additional cardiovascular risk factors is recommended due to the increased risk these patients face.

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[Case Study, Dr. Johnson's Column #39, Feb. 20, 2009](#)