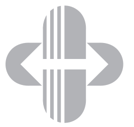

Diabetes Mellitus:

Diagnostic Criteria and Goals of Therapy

A SERIES OF 3 ARTICLES ON DIABETES MELLITUS FROM PHARMERICA

Diagnosis

The diagnosis of diabetes mellitus (DM) depends on several factors. Some symptoms associated with hyperglycemia (e.g., polyuria, polydipsia, weight loss, polyphagia, blurred vision) are nonspecific for DM and cannot be used alone for diagnosis. The Expert Committee on the Diagnosis and Classification of Diabetes Mellitus concluded that DM can be accurately diagnosed by three different methods: the casual plasma glucose test, the fasting plasma glucose test (FPG), and the oral glucose tolerance test (OGTT).[1] A positive result with any of these must be confirmed by retesting the individual on a subsequent day.[1]

> **Specific patient characteristics must be considered when setting therapy goals for patients with Type 1 and Type 2 DM**

Casual plasma glucose is measured by testing blood glucose at any time of day, independent of meal time.[1] The FPG measures blood glucose levels after caloric abstinence for at least 8 hours.[1] The OGTT measures plasma glucose 2 hours after administration of a glucose load (2-h PG), equivalent to 75 g anhydrous glucose dissolved in water [1]; however, this method is not recommended for routine clinical use.[1]

The criteria for the diagnosis of DM were revised recently. These criteria are based on the glucose threshold that places individuals at increased risk for developing adverse outcomes from DM.[1] The previous criteria indicated that a FPG 140 mg/dL, 2-h PG 200 in the OGTT, or both, was an accurate diagnosis of DM.[1] These values, however, did not represent equivalent degrees of hyperglycemia.[1] Almost all individuals with a FPG 140 mg/dL have 2-h PG 200 mg/dL if given an OGTT, whereas only about one fourth of patients without previous DM with a 2-h PG 200 mg/dL during an OGTT have a FPG 140 mg/dL.[1] The FPG represented a greater level of hyperglycemia than the OGTT. The OGTT level has been identified as the cutoff point at which the prevalence of the microvascular complications of DM (i.e., retinopathy, nephropathy, and neuropathy) increases greatly.[1] For this reason, the Expert Committee decided the FPG level used to diagnose DM should be equivalent, in degree of hyperglycemia, to the PG level used in the OGTT.[1] Thus the Expert Committee established the following guidelines for the diagnosis of DM:

—Symptoms of DM plus casual plasma glucose concentration 200 mg/dL (with confirmation on a subsequent day) **or**

—FPG 126 mg/dL (with confirmation on a subsequent day) **or**

—2-h PG 200 mg/dL during an OGTT (with confirmation on a subsequent day)

Goals of therapy

The primary goals of DM medical management are to maintain optimal glycemic control, prevent complications, and detect and treat the illnesses frequently associated with DM.[2] The Expert Committee has recommended specific glycemic targets based on clinical trials that should be used as a basis to set a goal for individual patients. The Diabetes Control and Complications Trial (DCCT) showed that intensive treatment regimens that lower hemoglobin A1c (HbA1c) levels to almost normal (HbA1c ~ 7.2%) reduced the risk of the development of or progression to retinopathy and neuropathy by 50% to 75% and albuminuria by 56% in type 1 DM.[3] The reduction in these complications correlated continuously with the reduction in HbA1c, indicating that the normalization of glycemic levels in patients with DM can prevent complications.[4] The results of the United Kingdom Prospective Diabetes Study Group (UKPDS) showed that glucose control in patients with type 2 DM reduced microvascular complications similarly to that seen in the DCCT in patients with type 1 DM.[5]

Specific patient characteristics must be considered when setting therapy goals for patients with type 1 and type 2 DM. Many important factors influence these goals, such as patients' capacity to understand and comply with the treatment regimen, their risk for severe hypoglycemia, and comorbid disease states that can increase risks or decrease benefits (e.g., end-stage renal disease, cardiovascular disease, cerebrovascular disease).[4] Self-monitoring of blood glucose levels also is important for type 1 and type 2 DM;

Table 1. Recommended Plasma Glucose Goals

Biochemical Index	Nondiabetic	Goal	Additional action suggested (a)
Preprandial glucose(mg/dL)	< 110	80 - 120	<80>140
Bedtime glucose(mg/dL)	< 120	110 - 140	< 100> 160
HBA1c (%)	< 6	< 7	> 8

HbA1c = hemoglobin A1c.

(a) Depending on individual needs, can include DM self-management education, change in therapy, more frequent blood glucose testing.

Continued on next page

Diabetes Diagnosis Continued

frequent monitoring (at least 3 to 4 times daily) will help prevent asymptomatic hypoglycemia, which can be caused by insulin or sulfonylureas use.[4] Table 1 lists the Expert Committee's recommendations for glycemic control in patients with DM. These values are generalized to all patients with DM and do not take into account individual factors that can warrant different goals.[4]

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