Hyperglycemosis. Proposal of a New Term

The etiology of idiopathic diabetes mellitus was generally thought to be the same or similar even though there were many different types and childhood diabetes was considered to be the most typical manifestation of this disease. Recent investigations have shown the etiology of diabetes is not simple nor homogenous but rather multiple or heterogenous. In some cases, the diabetic state results from an autoimmune process, some are provoked by viral invasion, some are associated with special HLA types, some are produced by abnormal-insulin secretion from the pancreas, or by defects in process of insulin biosynthesis. Diabetes can also result from defects in the insulin-insulin receptor axis, i.e., abnormalities in the insulin-receptors, insulin receptor antibodies, etc. More recently, abnormalities around the insulin gene locating short arm of the 11th chromosome have been found in some diabetic patients and this finding suggests the possibility of yet another new type.

The heterogeneity of diabetes mellitus is also suggested by studies on spontaneous diabetes in animals, especially in rodents. Some rats or mice mimic abrupt-onset ketosis-prone infant diabetes and others, insidious-onset mild adult diabetes. Furthermore, even in the case of the mild insidious-onset type, some are obese and others are non-obese. Therefore, it may be reasonable to speculate that there are many types of human diabetes even outnumbering spontaneous diabetes in animals.

Hence, we must question again what is diabetes. It is less reasonable to think of diabetes mellitus as one disease or one clinical entity and may be more reasonable to think of it as a syndrome characterized by chronic hyperglycemia, with small vessel disease occurring in the long clinical course. The term "diabetes mellitus (sweet polyuria)" was coined by Cullen according to the nomenclature system of Carl Linné in the 18th century when they had no knowledge of blood glucose or carbohydrate metabolism. We feel that this term has become too old-fashioned and vague to use in this modern age of far-advanced natural sciences and knowledge of the pathophysiology of diabetic state. The parable of the grown-up boy wearing infant's clothing provides a good analogy. The term has at least two meanings — in a broad sense, it describes disorders with hyperglycemia, and in a narrow sense, idiopathic diabetes mellitus. As medical progress will disclose more and more of the etiological mechanisms of diabetes mellitus, most of the cases presently classified as idiopathic will eventually be classified as non-idiopathic.

Hence instead of "diabetes mellitus", we would like to propose a new term "hyperglycemosiis" which can describe all states of chronic blood glucose elevation, irrespective of etiology. The term hyperglycemosiis should be used to describe cases with hyperglycemia before completion of etiological examinations such as endocrine pancreas, plasma insulin (to rule out abnormal insulin or receptor antibody), and endocrine functions, and the term diabetes mellitus only in the narrow sense for cases in which no etiological defect can be found except low plasma insulin level. As mentioned above, hyperglycemic states are heterogenous and for this reason, careful consideration should be paid in clinical investigations to the selection or comparison of cases with a homogeneous etiological background. However it is not easy to do so and in most cases, a compromise must be made in applying phenotypical classifications such as grade of hyperglycemia, body form, and others. Indeed, the studies on BB rats showed that mild hyperglycemic littermates of diabetic rats also exhibited typical findings of insulinitis in the pancreas. This indicates that there are noninsulin-dependent diabetic patients with insulinitis and shows that the clinical features of a diabetic state (phenotype) can differ even if its etiology (genotype) is the same.

To summarize, as the term "diabetes mellitus" is vague and can have various meanings, sometimes resulting in confusion, we propose the term "hyperglycemosiis" for chronic hyperglycemic states of any etiology. The term "diabetes mellitus" should be limited to idiopathic hyperglycemic cases in the stricter sense.

Yoshio GOTO, M.D.

Prof., The Third Department of Internal Medicine,
Tohoku University School of Medicine, Sendai