*Letters to the Editor***Diabetes Mellitus: A New Look at Diagnostic Criteria**

Sir,

Drs. Keen, Jarrett and Alberti [1] have recently proposed new diagnostic criteria for the oral glucose tolerance test (OGTT) which are similar to those considered by an NIH expert group [2]. The authors have asked for correspondence and criticism "based on facts and logic".

We would fully agree with the recommendation of a 75 g glucose load, the use of the term impaired glucose tolerance (IGT) instead of subclinical, chemical or asymptomatic diabetes and the use of much higher blood glucose levels for the diagnosis of diabetes which, in general, resemble the NIH recommendations. The combined use of fasting and 2 hour values for the diagnosis of IGT and diabetes, however, needs some reconsideration. Figure 1 demonstrates the proposed classification in a two dimensional graph using the results of 751 OGTT results

(75 g glucose, whole venous blood) from an earlier study [3]. For comparison the criteria proposed by the NIH are drawn in Figure 2.

With respect to the definition of diabetes the fasting value of 120 mg/dl (whole venous blood) or 140 mg/dl (venous plasma) is the more precise criterion (Fig. 1) since only 6 individuals would "falsely" be diagnosed diabetic compared to 44 "false" diabetics if based only on the 2 hour value. Rushforth et al. [4] who have studied the correlation of specific diabetic complications with GTT values came also to the conclusion that the fasting glucose determination is the better measurement for the diagnosis of diabetes (plasma glucose > 136 mg/dl). Accordingly, the NIH expert group recommends to make the diagnosis of diabetes on the basis of two or more fasting values > 140 mg/dl plasma glucose (= > 120 mg/dl whole venous blood).

Fig. 1. Two dimensional graph of the criteria proposed by Keen et al. [1]. Each point represents the result of one OGTT from an earlier study (whole venous blood). The test results delineated as "also IGT" are primarily not defined but in a footnote it has been recommended to assign all non classifiable test results to IGT

Fig. 2. Two dimensional graph of the criteria proposed by the NIH group [2]. This group recommends the use of the 2 hour value and "at least one values between zero time and two hours". Since mostly an 1 hour value will be taken as additional value it seems justifiable to adopt the original test results [3] in this way. The diagonal broken lines represent sum values of 300 [6] or 500 mg/dl [5], the vertical broken line represents a 2 hour value of 250 mg/dl [4]

Alternatively, the NIH group recommends that the diagnosis should be made on the basis of an OGTT (two hour value and at least one additional value ≥ 200 mg/dl). However, these criteria (Fig. 2) seem to be too loose. Rushforth et al. [4] have found optimal separation at a 2 hour value of 250 mg/dl (vertical broken line in Fig. 2). This corresponds approximately to the sum of 1 and 2 hour values of 500 mg/dl (diagonal broken line in Fig. 2) as proposed by us [5].

Impaired glucose tolerance, by definition, can not be defined by the fasting blood glucose levels. Furthermore, as can be seen from Figure 1 fasting values and 2 hour values are virtually not correlated in the whole range of normal and IGT. It is therefore not clear why the authors prefer to combine both these values of define IGT. Both, the proposed Keen criteria and the NIH criteria run into difficulties with an exhaustive definition. It does not seem logical to define IGT exactly and still to assign other test results not fulfilling the definitions to the same group (Fig. 1) or to leave certain combinations undefined (Fig. 2). If two separate stimulated values during OGTT are wanted these should be combined by simple summing, e.g. normal = sum of 1 and 2 hour values ≤ 300 mg/dl [6] or, slightly more logically but in a much more complicated fashion, by a discriminant function [7].

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