The Diagnosis of Preexisting Diabetes Associated With Acute Myocardial Infarction

Chun et al. (1) reported an increased risk of death among patients with first myocardial infarction in a population-based study of coronary disease morbidity and mortality. They comment that some misclassification bias was possible for patients who died, which may have led to an underestimation of the impact of diabetes on subject fatality. Further, they lightly dismissed the phenomenon of stress hyperglycemia because they classified all hyperglycemic patients diagnosed for the first time during hospitalization for myocardial infarction as undiagnosed diabetes. Such misclassification would lead to further distortion of the study results. We have shown that hyperglycemia after acute myocardial infarction is common, and that in most patients it is a temporary phenomenon (2) and is associated with activation of the pituitary adrenal axis (3). However, stress hyperglycemia is likely to have been underreported in the study of Chun et al. because it was population based.

The diagnosis of preexisting diabetes when associated with acute myocardial infarction, especially when transient, should be based on additional evidence of hyperglycemia, such as a diabetic glucose tolerance test response or raised HbA_{1c} level.

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How Well Do Patients With Type 1 Diabetes Measure Their Blood Glucose in Daily Life?

Numerous publications are available that address the technical aspects of blood glucose monitoring. However, the practical aspects of self-monitoring the actual metabolic control are less well studied. We have investigated how well patients with type 1 and type 2 diabetes can monitor their blood glucose immediately after participation in a structured treatment and teaching program and some years thereafter (1–3). In a recent population-based public health study aiming at assessment of the degree of diabetes care and education in the geographic area of Northrhine, Germany, we have had the opportunity to evaluate how well and with which technique randomly selected adult individuals with type 1 diabetes self-monitor their blood glucose (4).

Patients were recruited from a random sample of 630 primary care practices by means of a biometrical selection procedure. All patients were examined at their homes using a mobile ambulance as described previously (5). More than 60% of the patients had participated in a structured group treatment and teaching program for intensification of insulin therapy.

Of the 684 patients, 402 (59%) were men, and 282 (41%) were women (age 36 ± 11 years, duration of diabetes 18 ± 11 years, HbA_{1c} 8.0 ± 1.5% [mean ± SD]). A capillary blood sample was obtained by the patients, using their own method. The accuracy of blood glucose self-measurements was assessed by comparing the value obtained by the patient using his or her own method with a laboratory method. Plasma glucose was measured immediately in the van with the Reflotron (Boehringer Mannheim, Mannheim, Germany). Data from parallel measurements are available from 538 patients (79%). Reasons for the missing parallel measurements in 146 patients (21%) include the following: 54 patients did not have their glucose monitor with them (8%), 33 patients did not perform self-monitoring (5%), in 17 cases the patient's glucose monitor was defective (3%), 9 patients declined to perform parallel measurements (1%), in 9 cases no special reasons were given (1%), and in 24 cases the laboratory system was defective (4%).

Of the patients, 88% used a glucose monitor, and 9% used test strips. 579 patients (85%) reported that they measured their blood glucose at least twice daily, 463 (68%) reported that they measured it at least three times daily.

The parallel measurements resulted in an absolute difference of 0.5 ± 1.4 (−4.6–8.2) mmol/l (mean ± SD [range]; percentage difference of 8 ± 20% [−54–181%]). The systems used by the patients measured blood glucose, whereas the laboratory system measured plasma glucose. This systematic difference can be assumed to explain the deviation in the results. Error grid analysis showed that 90% of the measurements were in zone A, with deviations that were clinically not relevant, and 9% were in zone B, with clinically acceptable deviations.

This study shows that nearly all patients had the appropriate material available for self-monitoring of blood glucose. This is in contrast to the results of the Wisconsin study that included 750 type 1 diabetic patients at the 10-year follow-up (6). More than 21% of the participants of that study did not perform self-monitoring, and 24% performed less than one measurement per day. At least two measurements per day were done by only 42% of the patients, in contrast to 85% in our study. In the present study, the vast majority of the diabetic patients used a glucose monitor for self-monitoring.

The results of this study with a single parallel measurement of blood glucose by the patients and a laboratory method showed that randomly selected diabetic patients with type 1 diabetes do measure their blood glucose with sufficient reliability.

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A Word of Caution on the Use of Lispro

Kotsanos et al. (1) point out that lispro appears to have a measurably beneficial impact on lifestyle for patients with type 1 diabetes.

No doubt, insulin analogs are already contributing to better diabetes care and an improved quality of life for patients with type 1 diabetes. Lispro obviously is offering at least these two important characteristics.

Nevertheless, we would like to share observations on the use of lispro in intensive regimens (three daily premeal injections combined with Ultralente administration before going to bed) in 12 adolescents (14–17 years). Of these 12 patients, five had to return to their previous intensified insulin regimen of three injections of Regular or Actrapid plus Ultralente within 7–10 days of treatment because of the elevation of their blood glucose 2 h postprandially (180–240 mg/dl).

Because blood glucose levels were perfect (70–110 mg/dl) 1 h after lispro administration and meal ingestion, we thought that dosage increase could be helpful, but this resulted in hypoglycemia.

Therefore, we assumed that the Mediterranean diet, containing large amounts of fiber and nutrients with low glycemic indexes and slower absorption, may probably be the cause of hyperglycemia. We should wait for an analog with a longer action to use in such cases.

It should be added that by returning to their previous intensified regimens, patients succeeded in having their previous good control.

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Medicine and the Media

The B. case

In a March 1997 murder trial in Vienna, Austria, a 66-year-old woman, Mrs. B., was accused of having lethally poisoned a friend by use of glibenclamide tablets. Numerous media reports of the careful planning and ruthless execution of the murder and of Mrs. B.'s possible involvement in several other unsolved murder cases soon made the B. case well known throughout Austria. While investigations were ongoing and witnesses were examined, three patients were admitted to our hospital with problems related to the case.

Case 1: A 70-year-old man came into the emergency room feeling weak and complaining of polydipsia during the previous days. A history of diabetes since about 2 years and an actual fasting blood glucose of 218 mg/dl explained his condition. He had stopped taking glibenclamide for fear of deadly hypoglycemia after the media campaign surrounding the B. case. The patient was immediately treated with insulin and discharged from the hospital taking metformin twice a day after stabilization of his diabetes.

Case 2: A 69-year-old woman was admitted with a fever of 40°C. The results of medical history, physical examination, and laboratory tests led to the diagnosis of a urinary tract infection. Her blood glucose was 458 mg/dl. Fearing death, she had stopped taking glibenclamide 3 weeks earlier after hearing the latest news on the B. case. The patient was treated with insulin but could be dismissed again on twice-daily glibenclamide after 8 days in the hospital.

Case 3: A 17-year-old girl was brought to our intensive care unit with reported recurrent seizures during the 2 previous weeks. At admission, her blood glucose was 12 mg/dl. There was no history of diabetes or antidiabetic medication, but blood glucose stayed low during the following days and continuous intravenous glucose was necessary. Though the girl denied having taken tablets, a serum sample was found definitely positive for glibenclamide by the same forensic pathologist who was consultant in the B. case. Psychiatric therapy was introduced after suicide attempts in previous years were revealed. Presently, the patient is free from seizures, and blood glucose values have remained in a normal range throughout follow-up.

Health care personnel, as well as the media, should be aware of the influence that nationwide announcements of medical reports have on the public. The B. case is an example of the misuse of medical information on a broad public basis that has led to treatment errors, under- or overuse of recommended drugs, and unnecessary health damage, hospitalization, and cost. The media should be cautious about giving detailed information on the use of drugs in suicidal or homicidal attempts. Misinterpretation and misuse by patients and the public could be unintentional consequences.

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