0.001). The glycemic level was 10.9 ± 5.1 mM at baseline and 10.1 ± 4.3 mM during the clearance. Glycemic excursion between the points of the polyfructosan clearances was 0.97 ± 0.86 mM. Interference of glucose in vitro on inulinlike-polyfructosan assay was 3, 5, and 6% at glucose concentrations of 7.8, 13.1, and 19.9 mM, respectively. The intra-assay coefficient of variation of polyfructosan was <4.5%. Eighty percent of the GFR values obtained by polyfructosan were 5% higher than the values obtained by ^{51}Cr-EDTA. This difference between the two simultaneous clearances may be due to the interference of blood glucose on polyfructosan measurement or to the shorter period of observation with the polyfructosan clearances. Indeed, there was no correlation between the degree of hyperglycemia and the observed overestimation of GFR by polyfructosan clearance. Moreover, adding a 6% interference at each point of a classic disappearance curve (as in the presence of a steady glycemia of 13.9 mM), the final GFR did not change. Preventing glycemia excursion >5 mM between the points of clearance, variations of glycemia interference can be diminished below inulin intra-assay level. GFRs calculated with ^{51}Cr-EDTA at 190 min are ~10% greater than GFRs calculated with the clearance at 315 min due to the incomplete equilibration of the tracer (128.8 ± 13 vs. 116.8 ± 14.6 ml · min^{-1} · 1.73 m^{-2}). The shorter observation period of polyfructosan (due to technical difficulties of detecting low inulin concentrations at 315 min) may be similarly responsible for the overestimation versus the 315-min clearances with ^{51}Cr-EDTA.

We suggest that the use of any substance by single-injection technique may be interchangeable in diabetic patients with normal or elevated GFR, even if 5% overestimation is observed by two-compartment analysis of polyfructosan-decay curves. Inulinlike polyfructosan, a nonradioactive tracer, should be considered when frequent GFR evaluations are necessary, as in hyperfiltering diabetic patients, or when a nuclear-medicine department is not available. Otherwise, for routine periodic GFR assessment, ^{51}Cr-EDTA should be preferred because radioactive isotopes can be detected easily in body fluids and with greater accuracy.

EMILIO BOGNETTI, MD
LUIGI GIANOLLI, MD
MARIA CARLA PROVERBIO
MARIA PUZZOVIO
FRANCO MESCHI, MD
PAOLO GERUNDINI, MD
GIUSEPPE CHIUMELLO, MD

From the Pediatric Department and Endocrine Unit and the Nuclear Medicine Department, Scientific Institute San Raffaele, University of Milan, Milan, Italy.
Address correspondence and reprint requests to Dr. Emilio Bognetti, H. San Raffaele, Clinica Pediatrica III, Via Olgettina 60, 20132 Milan, Italy.

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Brain Wave on the Witness Stand

An idea came to me recently while I was on the witness stand. As diabetologists are called to do from time to time, I was giving my opinion as to whether hypoglycemia could have been to blame for an unusual act: in this case, an episode of presumed shoplifting. As I sat through the trial, I heard how the accused had spent time wandering back and forth through racks of clothing and transferring his groceries in and out of a gym bag in which he had his diabetes supplies and glucometer. The lawyer for the defense asked me if the behavior could in fact have been due to confusion because of hypoglycemia. I had to say that it was a distinct possibility. The prosecutor then asked me, if that had been the case, why had the accused not been sweating or shaking, and why had he been able to argue coherently with the security guard who arrested him? It was then that I had my brain wave.

I reasoned that the accused was on intensive insulin therapy. It is well recognized that, in diabetic patients under these conditions, the warning symptoms of hypoglycemia are sometimes lost (1). However, it is known that stimuli to epinephrine release can be selectively lost; i.e., secretion of epinephrine in response to a stim-

ulus other than hypoglycemia might have been preserved (2). I speculated, admitting that this was not proved, that the accused had indeed been neuroglycopenic from symptoms of severe hypoglycemia but that on being arrested, a surge of epinephrine rapidly improved his mental status.

The case was dismissed.

ELLEN L. TOTH, MD, FRCP(C)

From the Division of Endocrinology and Metabolism, The University of Alberta, Edmonton, Alberta, Canada.

Address correspondence and reprint requests to Ellen L. Toth, MD, FRCP(C), 362 Clinical Wing, Heritage Medical Research Centre, The University of Alberta, Edmonton, Alberta T6G 2S2, Canada.

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Meal-Related Insulin Supply in IDDM

Recently, Halfon et al. (1) reported that prandial insulin requirements of patients with insulin-dependent diabetes mellitus (IDDM) are linearly related to the amount of ingested carbohydrate (CHO). In their study, prandial insulin requirements ranged between 12 U for 60 g CHO and 31 U for a 140-g CHO meal. Although these figures were obtained by intravenous insulin delivery via Biostator, the authors propose that their findings should "help in programming open-loop systems . . . by the subcutaneous route."

However, there are some well-known differences concerning the pharmacokinetics of regular insulin between its intravenous and its subcutaneous administration that preclude unmodified application of Halfon et al's. data to practical subcutaneous insulin therapy. *1*) Used intravenously, regular insulin has 0 absorption time, whereas subcutaneously administered regular insulin has an absorption half-time of ~2–4 h (2). The elimination half-time of serum-insulin is only ~3–5 min (3). 2) Absorption time, and hence the duration of insulin action after subcutaneous injection, is dose-dependent (2); i.e., 4–6 h after injection of 0.1 U insulin/kg body wt s.c., serum insulin levels return to baseline, compared to >8 h after injection of 0.3 U insulin/kg body wt s.c. (4). *3*) Intestinal transit of food via the small intestine (particularly the upper jejunum where glucose absorption takes place) is completed within 4–5 h and is relatively independent of composition and size of a meal (5–7). This is confirmed by the data of Halfon et al. (1). In their study, blood glucose levels have returned to baseline already 3–4 h after ingestion of 60 g CHO, whereas more than twice that amount of CHO (140 g) prolonged the elevation of glycemia and of insulin infusion rates for only 1 h longer.

What does all this mean for practical insulin therapy? A 140-g CHO meal would require 31 U of regular insulin for normoglycemic metabolism according to Halfon et al. If administered subcutaneously to a normal-weight adult, this insulin dose would act for >8 h, which is considerably longer than the intestine would require to absorb glucose from the ingested food; late postmeal hypoglycemia would be the consequence. It therefore seems prudent to limit the amount of CHO per meal to ~80 g (and the amount of insulin to balance this load to ~10–15 U) to ensure synchronization of the hypoglycemic effect of insulin and the hyperglycemic effect of the food during the entire absorptive process. This has been recommended to patients on intensive insulin therapy and liberalized diet in our department with satisfactory results (8).

ERNST CHANTELAU, MD

From the Diabetes Outpatient Clinic, Department of Nutrition and Metabolic Diseases, Heinrich-Heine University, Düsseldorf, Federal Republic of Germany.

Address correspondence to Ernst Chantelau, MD, Diabetesambulanz, Medizinische Abteilung für Ernährung und Stoffwechselkrankheiten, Heinrich-Heine-Universität, Moorenstrasse 5, D-4000 Düsseldorf, FRG.

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