

lower-limb amputation in elderly type I diabetic patients?

These preliminary data will be followed by a full description of findings, potentials for effacing the foot deformities, and an expression of hallux valgus etiology. The correlation of this foot deformity with those of limited joint mobility offers great opportunity for study. Does glycosylation resulting from metabolic derangements in type I diabetes with final muscle and joint deformity play a role in the high incidence of lower-limb amputation in elderly type I diabetic patients? I seek the findings of other clinicians scrutinizing the feet of children with and without diabetes.

SAMUEL EICHOLD, MD, FACP

From the Department of Medicine, University of South Alabama College of Medicine, and Camp Seale Harris, Mobile, Alabama.

Address correspondence and reprint requests to Samuel Eichold, MD, FACP, University of South Alabama College of Medicine, 2451 Fillingim Street, MSTN 415, Mobile, AL 36617.

Pancreatic Diabetes With Severe Generalized Allergy to Purified Beef, Pork, and Human Insulins

We report herein a case of pancreatic diabetes with local and generalized allergy to highly purified insulins including recombinant and semisynthetic human insulin preparations.

In 1983, 3 yr after acute pancreatitis, a 60-yr-old nonatopic man was diagnosed as having diabetes. One week of sulfonylurea treatment had no effect on his blood glucose control. Despite the commencement of insulin treatment with Isujilin (lente-type pork and beef insulin, Shimizu, Shizuoka, Japan), his glycemic control was poor. In 1987, 4 yr after insulin treatment began, injections produced local itchy-wheal and flare reactions followed by acute dyspnea. Thereafter, Humulin N (recombinant human insulin, Shionogi, Osaka, Japan) was introduced once daily. After his second injection, the local reaction reappeared and persisted for 1 yr. On 26 June 1988, he experienced generalized itching and severe dyspnea after 30 U of Humulin N. Insulin was stopped, and he was transferred to Kobe University Hospital. Prick tests showed immediate local reactions to most commercially available insulin preparations including recombinant human insulin (Humulin N and Humulin R), semisynthetic human insulin (Actrapid human, Monotard human, and Novolin U, Novo, Copenhagen), pork insulin (Insulatard, Nordisk, Copenhagen; Actrapid MC, Monotard MC, and Semilente MC, Novo), and beef insulin (ultralente, i.e., zinc sulfate or saline.

Because ketonuria appeared during the prick test, a standard desensitization was performed with Actrapid human insulin (1). Three weeks later, the patient was managed with three daily injections of Actrapid human insulin. His condition improved, and he gained weight. Thereafter, desensitization was performed with Monotard human insulin. Twice-daily injections of Monotard human insulin during the second desensitization led to good glycemic control. One week later, however, the local reactions reappeared, and the glycemic control became poorer. Because the patient refused to receive steroids for the prevention of generalized allergic reaction, the syringe was rinsed with a 1% solution of *d*-chlorpheniramine maleate before insulin injection to prevent local reactions. After this procedure, the patient's diabetes was eventually managed with this insulin preparation.

A full blood cell count including eosinophil percentage (2%) was normal, and total serum IgE concentration on admission was 452 U/ml (normal value <120). Insulin-specific IgE was exceptionally high at 5.2 Pharmacia reference units (normal value <0.35) (2). An abdominal X ray showed multiple pancreatic stones.

The cause of allergy to human insulin and the nature of the antigen remain unclear. However, an allergic reaction to human insulin preparations might be due to the hapten carrier characteristics of immunogenic pork or beef insulin in relation to the haptenic role of human insulin (3).

The patient refused administration of glucocorticoid because of well-known side effects. Therefore, the syringe was rinsed in an antihistamine agent to prevent local reactions. The prevention of local reactions also seemed to improve glycemic control of the patient. Thus, this procedure can be an alternative to steroid treatment for insulin allergy.

Generalized allergic reactions to human insulin are still rare. Moreover, we could not find any report concerning this type of allergy with secondary diabetes. This case of severe generalized allergy to human insulin was eventually managed with a desensitized insulin preparation.

GEN YOSHINO, MD
WATARU YAMACHI, MD
HIROAKI MORIYAMA, MD
HIROHISA UENO, MD
AKIO INUI, MD
MUNETADA OIMOMI, MD
SHIGEAKI BABA, MD

From the Second Department of Internal Medicine, Kobe University School of Medicine, Chuo-ku, Kobe; Hidaka Hospital, Kinosaki; and Hyogo Institute for Research in Adult Diseases, Akashi, Japan.

Address correspondence and reprint requests to Dr. Gen Yoshino, Second Department of Internal Medicine, Kobe University School of Medicine, Chuo-ku, Kobe 650, Japan.

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Effect of Diabetes Education on Self-Care Metabolic Control and Emotional Well-Being

I refer to the article by Rubin et al. (1) assessing the outcome of their 5-day diabetes-education program (DEP). The improvement in the parameters assessed is indeed gratifying, although the HbA_{1c} improvement representing only 43% of the patients educated should be interpreted with caution.

I take exception to the unreferenced statement of Rubin et al. that "educational interventions that consist of a few sessions spread out over a long period will probably be less effective" than their 5-consecutive-day program. Our experience indicates the opposite may be true. At the 13th International Diabetes Federation meeting, Beeney et al. (2) presented the results of a 3-yr study comparing four DEPs of varying lengths held at Sydney Teaching Hospitals (of which we were 1). They showed that, at a 12-month follow-up, "knowledge improvement was independent of programme format," and "normalisation of psychological adjustment was (in fact) enhanced when group education was distributed over time (up to 6 weeks)." They concluded that "future DEP design must rationalise the demonstrated benefits of extended educational formats, with the size and needs of the local population (higher patient turnover in shorter DEPs), to provide the most cost-effective use of available resources."

The formula of who is to teach what, when, and how and how to assess suitable outcome seems to be the Holy Grail of diabetes education. We must continue to strive to answer these questions to maximally benefit most of our patients with our often limited resources.

I await with interest Rubin et al.'s data on their patient group at the 12-mo follow-up or later.

JEFF R. FLACK, MD

From the Diabetes Centre, Lidcombe Hospital, Sydney, Australia.

Address correspondence and reprint requests to Dr. Jeff R. Flack, FRACP, Diabetes Centre, Lidcombe Hospital, Joseph Street, Lidcombe, NSW 2141, Australia.

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Reply

Flack highlights an important issue raised in our article (1), i.e., that program design is a critical factor in the efficacy of educational interventions. We agree with his suggestion that education programs of extended duration can be effective, although we did not perform a comparison of condensed and extended programs. We suspect that extended programs provide support in maintaining psychological well-being and regimen adherence. An interesting question for future research is whether some critical amount of education must take place before the support function can be effective and, if so, how much?

Although program format may influence efficacy, we believe that the more important factors are what is taught and time devoted to teaching it. Few would disagree that more education is better, although it is not clear at what point returns begin to diminish. We therefore reiterate that "a few sessions" are likely to be inadequate, while admitting we do not yet know how much is enough.

Although not all programs are effective in achieving comprehensive goals (2), recent meta-analyses of diabetes education have demonstrated beneficial effects (3,4). Future research should seek to identify elements of content and process that contribute to the efficacy of these programs.

In response to Flack's interest in our 12-mo follow-up data, we note that a report of these results has been submitted for publication.

MARK PEYROT, PhD
RICHARD R. RUBIN, PhD
CHRISTOPHER D. SAUDEK, MD

From the Diabetes Center and Department of Medicine, Johns Hopkins University School of Medicine; and Loyola College Center for Social and Community Research, Baltimore, Maryland.

Address correspondence and reprint requests to Dr. Mark Peyrot, Loyola College, Baltimore, MD 21210.

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