4) Logistic regression analysis is appropriate, as BMI was entered into the equation as a categorical variable, in three categories, where the rate in the two extreme ones is compared to the middle one.

5) Our questionnaire referred to all types of habitual activity, including work time as well as at leisure time. The rate of persons involved in any type of sport was minimal. "High" physical activity was defined as activity score in the highest tertile of the study group. The score consisted of the weekly number of hours spent in moderate activity (heavy activity was not reported by any of the 502 individuals constituting the subsample interviewed for dietary intake and physical activity) + half of the hours spent in light activity defined according to the Committee on Dietary Allowances [2]. Using this crude measure, and accounting for age, BMI and total caloric intake, the risk for Type 2 diabetes for "highly" active individuals of both sexes was 0.67 with 90% confidence limits 0.47-0.96 ($p = 0.04$) [3]. This was validated by significantly lower insulin response in the "highly" active individuals in all sex and BMI categories (unpublished data).

Yours sincerely
M. Modan, A. Karasik and H. Halkin

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The editor apologizes for the inadvertent error made during the editing and production process of Dr. Modan's letter [Diabetologia (1986) 29:408]. Instead of "in both Type 1 and Type 2 diabetes" it should have been printed "in both diabetes categories", as originally submitted by Dr. Modan and her associates. The editor deeply regrets this technical error.

Type 1 (insulin-dependent) diabetes and the question of heterogeneity

Dear Sir,

I read with interest the report entitled "HLA-DR3 is associated with a more slowly progressive form of Type 1 (insulin-dependent) diabetes" by Ludvigsson et al. [1]. Since many of those interested in the causes of Type 1 diabetes mellitus believe in the likelihood of genetic heterogeneity, studies attempting to correlate phenotypes with genetic markers are welcome and may shed light on this important question. Unfortunately, most, if not all, claims of such correlations have lacked adequate confirmation. This confusing state of affairs has involved age of onset and other clinical parameters, as well as immunological indicators such as islet cell antibodies, insulin antibodies, etc.

The results of Ludvigsson et al. [1] seem to be in apparent conflict with data we reported recently [2] from cross sectional studies of serum C-peptide in Type 1 diabetic patients and their siblings. We found in this study that DR4+ diabetic patients showed better preservation of their C-peptide blood concentrations than diabetic patients with other HLA types. It is difficult to reconcile these findings with the Ludvigsson et al. [1] results showing that DR3+ diabetic patients have a milder disease. Both our study [2] (not prospective) and the Ludvigsson et al. study [1] (based on questionnaire data and multicenter) have weaknesses. Thus, this subject needs independent confirmation.

The observation by Ludvigsson et al. [1] that 15 patients were DR4−, DR3−, DR2+, presumably mostly from France, is of considerable interest. We have recently shown that there is a third HLA-related susceptibility axis for diabetes (in addition to the DR3− and DR4− related axes) defined by homozygous typing cells (Dw) and restriction fragment length polymorphisms which is part of DR2-LD-MN2 as well as DR1-Dw1 haplotypes [3]. Those 15 patients presumably carried one or both of these haplotypes.

Yours sincerely,
J. Barbosa

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Hyperkalaemia after interruption of CSII

Dear Sir,

It has recently been suggested that the serum potassium concentrations on admission to hospital with ketoacidosis may be higher in patients treated by continuous subcutaneous insulin infusion (CSII) compared to those receiving conventional injection therapy [1].

In consideration of the possible risks of hyperkalaemia, it may be of interest to reconsider the study which we published in *Diabetologia* in 1982 [2], where CSII was deliberately interrupted for 9 h in 9 resting and fasting Type 1 (insulin-dependent) diabetic patients. We did not record plasma potassium levels at the time of the study, but we have now measured by flame photometry the values on the stored plasma samples (kept at −40 °C) from the 7 C-peptide negative patients (all male, mean ± SD age 33 ± 12 years, duration of diabetes 13 ± 6 years). Figure 1 shows the results, together with the changes in plasma glucose, blood 3-hydroxybutyrate and plasma free insulin concentration, which were assayed at the time of the study. Mean plasma potassium levels increased throughout the 9 h and were significantly different from baseline at all time points from 6 h ($p < 0.01$, t-test) until the end of the experiment ($p < 0.01$).

Clearly, delayed measurement is not ideal, and small alterations in concentration by sublimation may have occurred; however, the values may be taken as a reassurance that dangerous hyperkalaemia is unlikely to occur after 9 h of withdrawal of pump therapy under these conditions. The highest recorded plasma potassium value was 6.0 mmol/l in one patient at 8 h.

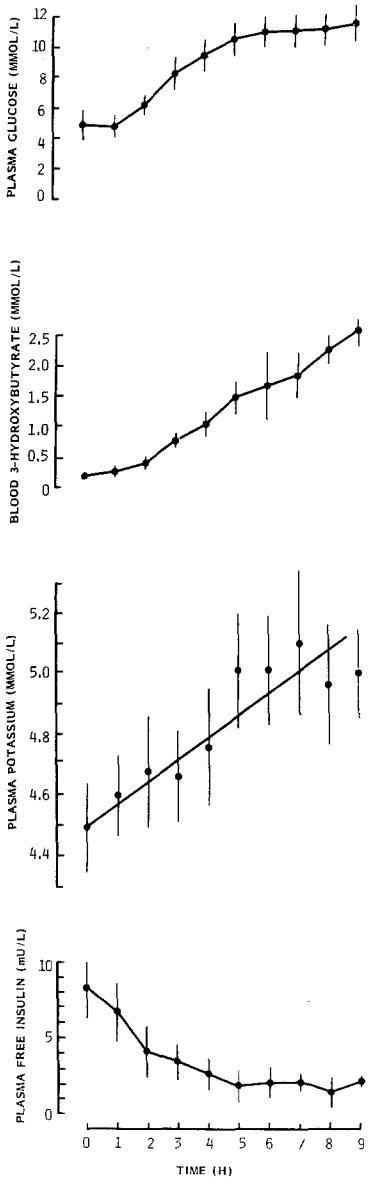

Fig. 1. Mean ± SEM plasma glucose, blood 3-hydroxybutyrate, plasma potassium and free insulin concentrations in seven Type 1 diabetic patients after deliberate disruption of CSII (time 0)

However, these results differ from those recently reported by Knight et al. [3], who employed a similar experimental protocol. These authors found that plasma potassium levels were not different after 8 h of pump disruption compared to baseline.

Although the frequency of ketoacidosis during CSII is probably no greater than on injection therapy [4, 5], exercise, feeding and the stress of infection may exacerbate metabolic decompensation in these patients, who are already at risk because of the small subcutaneous reservoir of insulin during CSII. We must therefore remain alert to the potential dangers of accidental stoppage of CSII, and to the clinical and biochemical course of ketoacidosis in these patients.

I thank my colleagues who helped in the original study and Peter Tutt, who performed the subsequent potassium measurements.

Yours sincerely,
J. C. Pickup

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Announcements

European Diabetes Epidemiology Study Group (EDESG)
The next meeting of the EDESG will be held in Oxford, UK from 12-15 April 1987. The *major topics* for discussion are: (1) the importance of hypertension in the development of micro and macro angiopathy in diabetes; (2) the relationship of obesity to diabetes morbidity; (3) the relationship between nutritional factors, and in particular, protein intake and renal function in insulin-dependent diabetes. *For further information contact:* Dr. J. I. Mann, Department of Community Medicine and General Practice, Gibson Laboratories Building, Radcliffe Infirmary, Oxford OX2 6HE, UK. Tel.: (0865) 511293/4

International Symposium - Diabetic Complications '87
This symposium will be held at the Consiglio Nazionale delle Ricerche, Piazzale A. Moro, Rome from 29-31 October 1987. *Main topics* will include the epidemiology, pathogenesis, clinical aspects, therapy and prevention of diabetic retinopathy, nephropathy, macroangiopathy and neuropathy. Authors should send three copies of an abstract of about 400 words to the Scientific Secretariat to be received by *30 June 1987.* Details on presentation and publication will be sent after acceptance. The Scientific Committee will award bursaries for travel to Rome to four researchers selected from those submitting free communications. Publications will include a Review Book on Diabetic Complications, an Abstract Book and Proceedings Volume. *Further details are available from:* Diabetic Complications '87, c/o Istituto G. Mendel, Piazza Galeno 5, I-00162 Roma, Italy. Tel. (06) 868736