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Letters to the Editor

Correlation between Fasting Serum C-Peptide and B Cell Insulin Secretory Capacity in Diabetes Mellitus

Sir,

In subjects with Type 1 (insulin-dependent) diabetes an indication of B cell insulin secretory capacity may be obtained by measuring serum C-peptide reactivity before and after an appropriate stimulus. Of the agents used, glucagon has been stated to be the most suitable [1]. A significant correlation between fasting and stimulated serum C-peptide reactivity has been observed [1, 2] and denied [3]. To clarify these differences, we measured B cell secretory capacity in 16 subjects with Type 1 diabetes whose age at onset of disease was less than 40 years (group 1), 18 subjects with Type 1 diabetes whose age at onset of disease was 40 years or more (group 2) and 22 subjects with Type 2 (non-insulin dependent) diabetes whose age at onset of disease was 40 years or more (group 3). Serum C-peptide reactivity was measured [4] in the fasting state, and 3, 6 and 10 min after the end of a 3-min IV infusion of 1 mg of glucagon. Only subjects showing a significant post-glucagon increase in serum C-peptide reactivity (> 12% of fasting level) were included in the study [1].

Fasting serum C-peptide reactivity levels were plotted against maximum serum C-peptide reactivity for the subjects in each group (Fig. 1). There was a positive correlation between the variables in each group; $r = 0.986$, 0.974 and 0.897 for groups 1, 2 and 3, respectively ($p < 0.0001$ in each case). These data compare with correlation coefficients of 0.86 [1] and 0.79 [2] in subjects with Type 1 diabetes whose age at onset of disease varied between 3–50 years and 13–49 years, respectively. Eff et al. found a correlation between fasting and post-glucose serum C-peptide reactivity ($r = 0.69$) in Type 1 diabetic subjects whose age at onset of disease was < 30 years [5]. Mirel et al. [3] failed to find a correlation between fasting and post-glucagon serum C-peptide reactivity in Type 1 diabetic subjects whose age at onset of disease was 5–19 years (for all but one subject, range was 5–15 years). In group 1 subjects in this study, age at onset of disease ranged from 14–39 years.

These results confirm that there is a positive correlation between fasting serum C-peptide reactivity and B cell insulin secretory capacity in subjects with Type 1 diabetes. This correlation may not be present when the disease develops in childhood. The correlation between fasting serum C-peptide reactivity and B cell secretory capacity is also present in subjects with Type 2 diabetes.

Yours sincerely,

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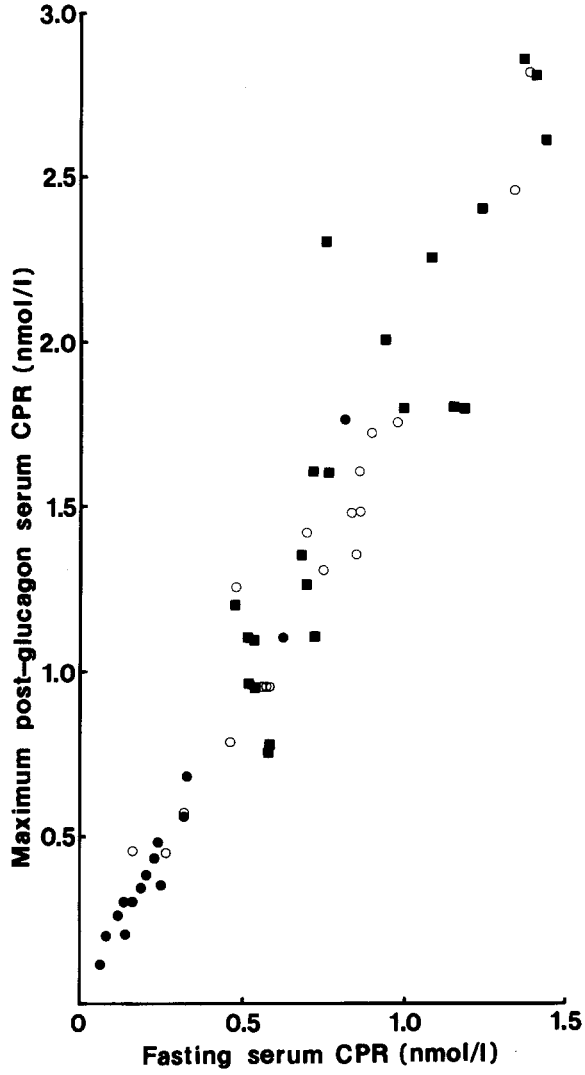

Fig. 1. Correlation of fasting serum C-peptide reactivity (CPR) with maximum post-glucagon serum C-peptide reactivity for subjects in group 1 (●), group 2 (○) and group 3 (■). Data for the equation $y = mx + b$ were: group 1, $m = 2.02$, $b = -0.03$; group 2, $m = 1.85$, $b = 0.00$; group 3, $m = 1.85$, $b = 0.07$

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