

COMMENTS AND RESPONSES

Seasonal Changes in Preprandial Glucose, A1C, and Blood Pressure in Diabetic Patients

Response to Liang

Liang (1) reported seasonal variations in preprandial glucose, A1C, blood pressure, and LDL cholesterol in Taiwanese Chinese type 2 diabetic patients, which correlated inversely with monthly mean temperature, with higher values in the winter and lower values in the summer. We found that mean monthly temperature strongly correlated ($r^2 = 0.76$, $P = 0.0002$) with serum 25-hydroxyvitamin D3 [25(OH)D3] measured monthly in 30 healthy subjects (median age 10.5 years, 15 male subjects). We suggest that Liang's observations could, instead, be due to variation in vitamin D nutrition, reflected by the seasonal variation in the serum concentration of 25(OH)D3.

A relationship between serum 25(OH)D3 and the parameters measured by Liang has been documented in cross-sectional studies. Thus, low serum 25(OH)D3 was associated with glucose intolerance, as well as diabetes (2) and insulin resistance (3). Serum 25(OH)D3

and homeostasis model assessment of insulin resistance, a validated index of insulin resistance, were inversely associated in a large Caucasoid population (4), and a study of 164 healthy adults found a positive correlation between serum 25(OH)D3 and insulin sensitivity measured by hyperinsulinemic clamp (3). Serum 25(OH)D3 in Japanese type 2 diabetic patients correlated inversely with A1C levels (5), whereas serum 25(OH)D3 and blood pressure correlated inversely in 12,644 subjects in the Third National Health and Nutrition Examination Survey (6) in which serum 25(OH)D was ethnic group- and skin pigmentation-dependent, with non-Hispanic black subjects having the lowest levels and the highest blood pressure, followed by Mexican Americans and non-Hispanic white subjects. Furthermore, supplementation with 25(OH)D3 (700 IU/day) over 3 years resulted in lower fasting plasma glucose levels in Caucasoid adults with impaired fasting glucose compared with placebo control subjects (7).

It would be of great interest, therefore, to know whether the changes in metabolic parameters and blood pressure measured by Liang were mirrored by inverse changes in serum 25(OH)D3.

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