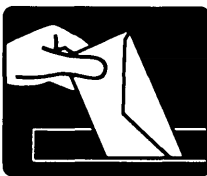


Letters to the Editor



Accurate Home Glucose Monitoring Without a Meter

Recognition of the unreliability of urine glucose measurement to attain good diabetic control^{1,2} has been accompanied by the development of methods to estimate glucose concentration by finger stick blood specimens in the home setting. Home monitoring of blood glucose has provided data for improving control in insulin-dependent patients.³⁻⁵

The Ames Dextrostix Eyetone (ADE) system, involving an enzymatic reagent-impregnated strip with a color reactant and a reflectance meter, is the most widely used method in this country.^{5,6} Other systems have been developed also using reflectance meters and costing from \$200 to \$600. Mains connection is necessary for the Eyetone meter.

The Chemstrip system (Bio-Dynamics/bmc) has been recently introduced and has the following advantages over ADE:

1. The two-color reagent pad is compared with nine dual color blocks and does not require a meter for acceptable clinical accuracy.

2. Gradations from 20 to 800 mg/dl provide a greater range than the 50-400-mg/dl limits of ADE, particularly important in the hypoglycemic range.

3. Blood is wiped off the stick with cotton rather than washed off with a jet of water. This eliminates the need for an available water supply. The variable of whether washing is with a jet or a gentle stream, which may affect Dextrostix results, is also eliminated.

4. Timing of reading after the 1-2-min development time is not critical, because the colors remain fixed for days in contrast to the rapid darkening of Dextrostix. This permits verification of readings by others.

With any available system, high accuracy can be obtained in the laboratory, where technicians compare results to glucose analyzer data. To determine reliability in actual practice, we had patients fill a heparinized capillary tube from a finger puncture before placing a drop on the Chemstrip. The blood was placed in a fluoridated microcentrifuge tube and stored in the refrigerator. Patients recorded the value obtained by Chemstrip reading, labeled the tube, and brought

accumulated tubes to the laboratory within 24 h. Samples were centrifuged and the serum tested with a Beckman Glucose Analyzer. Seventeen adolescents and adults provided 98 specimens with a range of 20-400 by Chemstrip and 4-480 by glucose analyzer. For analysis, values read between the color blocks were interpreted as midway, although some patients could interpolate more accurately than that. In no instance were estimates so different from laboratory determinations that an erroneous clinical decision would have been made (Figure 1).

These preliminary data indicate a reliable, simple, and portable system for self-management.

PAUL KUBILIS
ARLAN L. ROSENBLUM
GAINESVILLE, FLORIDA

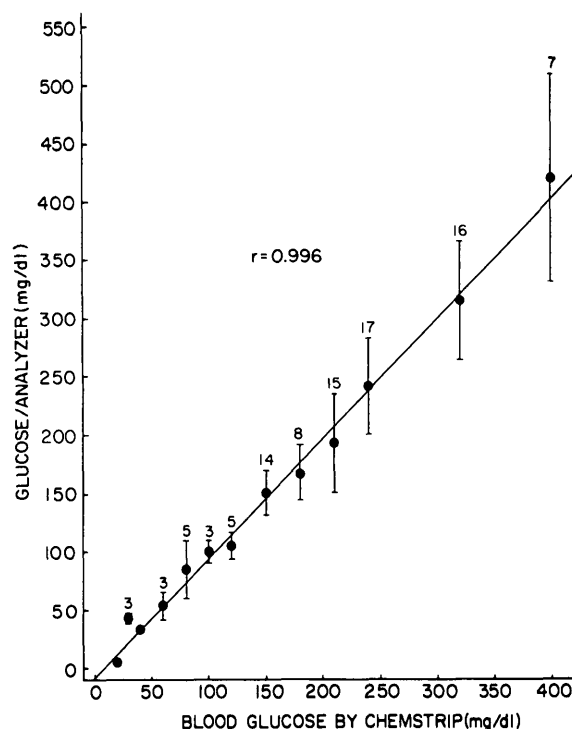


FIG. 1. Comparison of determinations of blood glucose by Chemstrip and plasma glucose by the Beckman Glucose Analyzer.

Address reprint requests to Arlan L. Rosenbloom, Department of Pediatrics, Box J-296, JHM Health Center, Gainesville, Florida 32610.

REFERENCES

- ¹ Malone, J. I., Rosenbloom, A. L., Grgic, A., and Weber, F. T.: The role of urine sugar in diabetic management. *Am. J. Dis. Child.* 130: 1324-27, 1976.
- ² Ohlsen, P., Danowski, T. S., Rosenblum, D. H., Mreiden, T., Fisher, E. R., and Sunder, J. H.: Discrepancies between glycosuria and home estimates of blood glucose in insulin-treated diabetes mellitus. *Diabetes Care* 3: 178-83, 1980.
- ³ Sonksen, P. H., Judd, S. L., and Lowy, C. H.: Home monitoring of blood-glucose. *Lancet* 1: 729, 1978.
- ⁴ Walford, S., Gale, E. A. M., Allison, S. P., and Tattersall, R. B.: Self-monitoring of blood glucose. *Lancet* 1: 732, 1978.
- ⁵ Ikeda, Y., Tajima, N., Minami, N., Ide, Y., Yokoyama, J., and Abe, M.: Pilot study of self-measurement of blood glucose using the Dextrostix/Eyetone system for juvenile-onset diabetes. *Diabetologia* 15: 91-93, 1978.
- ⁶ Barbosa, J., Menth, L., Schumacher, G., Johnson, S., and Najarian, J.: Feasibility of blood glucose self-monitoring in unstable insulin-dependent diabetes. *Diabetes Care* 3: 155-59, 1980.

Association of Smoking with Insulin Requirement and Serum Triglyceride Level

Masbad et al.¹ recently reported on their interesting study of the influence of smoking in 163 insulin-treated adults with diabetes. In many respects there were no significant differences between smokers and nonsmokers, but their smokers required higher dosages of insulin and had higher serum triglyceride levels than nonsmokers. These investigators suggested that these statistically significant associations might

reflect an effect of smoking. However, an alternate possibility is that these associations were the result of confounding variables.

We therefore examined in another, larger group of 970 adults with diabetes the relationship of cigarette smoking with insulin requirement and serum triglyceride concentration. Among 246 Oklahoma Indians with diabetes who smoked, 22% were being treated with insulin, while 20% of 526 who did not smoke were receiving insulin. This difference between 20% and 22% was not statistically significant. In contrast to the study cited above, in our insulin-treated patients (198), mean daily insulin dosage was somewhat higher in our nonsmokers (58 U daily) than in our smokers (47 U). Mean serum triglyceride values were not higher in our smokers (222 mg/dl) than in nonsmokers (226 mg/dl). Thus, in our study there was no evidence of an unfavorable effect of smoking on insulin requirement or serum triglyceride level.

Confounding variables may, of course, mask associations, but we could not identify any factors that could have hidden an effect of smoking on these variables. The characteristics of our population have been described in some detail.^{2,3}

KELLY M. WEST

OKLAHOMA CITY, OKLAHOMA

REFERENCES

- ¹ Madsbad, P., McNair, M. S., Christensen, C., et al.: Influence of smoking on insulin requirement and metabolic status in diabetes mellitus. *Diabetes Care* 3: 41-45, 1980.
- ² West, K. M., Erdreich, L. J., and Stober, J. A.: Absence of a relationship between smoking and diabetic microangiopathy. *Diabetes Care* 3: 250-52, 1980.
- ³ West, K. M., Erdreich, L. J., and Stober, J. A.: A detailed study of risk factors for retinopathy and nephropathy in diabetes. *Diabetes* 29: 501-508, 1980.