Low Serum Creatine Kinase Values in Contraceptive Steroid Users

To the Editor:

Hinderks and Frohlich (1) recently reported an association between low serum creatine kinase (CK; EC 2.7.3.2) values and administration of steroids in patients suffering from various diseases. Steroids reportedly prevent the rise in serum CK in experimental myocardial ischemia due to their "membrane stabilizing effect" (2, 3).

I wish to describe the effect of oral contraceptive steroids on serum CK. Serum CK activity was measured according to Sigma Technical Bulletin No. 520 (4) as part of a group of enzymes in 20 healthy women of reproductive age who were not taking any steroid (control group) and 10 healthy women of reproductive age who had been taking an oral contraceptive (Primovlar, Schering) for nine consecutive months.

The mean (and SD) serum CK was 7.65 (3.17) Sigma units/mL in the control group and 4.80 (2.21) Sigma units/mL in the group taking the oral contraceptive. On applying Student's t-test, the difference was found to be statistically significant (p < 0.02). None of the individual values, however, was below the lower limit of normal, which is 0 Sigma units/mL according to the Sigma Bulletin (4) and was 1.5 Sigma units/mL in my control group (mean – 2 SD).

Lanza (5) reported that progesterone decreased the myometrial CK activity in non-gravid human subjects. This might explain the lower value for serum CK in contraceptive steroid users. I wonder if the "membrane stabilizing effect" of glucocorticoids (2, 3) is shared by other steroids as well.

References


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Glucose Estimated with a Beckman Glucose Analyzer 2 in Spots of Capillary Blood on Filter Paper

To the Editor:

Home glucose monitoring by use either of commercially available glucose reagent strips with or without a meter (1) or collection of spots of capillary blood onto a suitable filter paper that may be posted to the laboratory for analysis (2) is gaining wider acceptance.

The latter approach has been found to be particularly useful in the management of young patients (3). A manual colorimetric method (2) and an automated method (4) have been described for estimating glucose in dried blood spots. We appreciated that the workload in many pediatric laboratories may be too small to justify use of an automated method and were cognizant of the fact that many pediatric units or laboratories use a Beckman Glucose Analyzer 2 to monitor glucose homeostasis. We have therefore developed a method for estimating glucose eluted from blood spots on filter paper with this analyzer and thought our observations might interest those having responsibility for the care of diabetic children.

We applied spots of venous blood, collected from adult diabetics, to filter paper (Whatman no. 4619) that previously had been saturated with a 50 g/L benzoic acid solution and then dried (2). A disc 6 mm in diameter (equivalent to 10.6 μL of blood), punched from the center of the dried blood spot with a Velos Easipunch 4363, was transferred to a suitable tube and allowed to elute for at least 1 h in 50 mL of a 20 g/L trichloroacetic acid solution. The sample was then centrifuged (3000 g, 10 min) and 50 μL of supernatant was injected into the Analyzer, which had been previously standardized as follows:

Standard solutions of glucose, 1.1 and 2.2 mmol/L, were prepared in saturated benzoic acid solution. We injected 50 μL of each standard into the Analyzer, which was calibrated to read 8.3 and 16.6 mmol/L, respectively, [Calculation: 1.1 mmol/L × (80 μL/10.6 μL) = 8.3 mmol/L.]

Under these conditions the readout of the injected eluate corresponds to the original glucose concentration in whole blood. The readout is linearly related to concentration over the range 3–20 mmol/L, with an intra-assay CV in our hands of 6.3%. The mean analytical recovery of glucose, calculated from the glucose concentration of the original whole blood sample (n = 29) as measured by an automated glucose oxidase method (5), was 98.2% (SD, 8.6%). The elution and injection volumes were selected after some experiments designed to define the minimum elution volume and maximum injection volume in order to optimize the sensitivity, recovery, and linearity of the method. Elution volumes of <80 μL resulted in lower recovery (e.g., elution with 50 μL and injection of 25 μL resulted in deviations from linearity below 5 mmol/L). Under the conditions recommended there is deviation from linearity at glucose concentrations <3 mmol/L, but we believe that this is of little consequence because other methods for home glucose monitoring are also imprecise in the hypoglycemic range.

We believe that this method will prove useful to those laboratories possessing a Beckman Analyzer 2 and will provide useful information in home monitoring of glucose homeostasis in the young diabetic along the lines recently suggested by Baumer et al. (3).

References

1. Editorial. Home monitoring: Revolution,