Correlation between Glycosylated Hemoglobin in Specimens Containing Potassium EDTA and Fluoride/Oxalate

To the Editor:

We recently started estimating glycosylated hemoglobin (HbA1) by using an agarose electrophoresis system (Corning Medical and Scientific, Palo Alto, CA 94306). It is recommended in the manufacturer's literature that potassium EDTA-anticoagulated samples should be used. We routinely estimate glucose in fluoride/oxalate-anticoagulated samples, so we decided to compare results for HbA1 samples anticoagulated in the two ways.

Blood specimens from 80 patients who were attending the diabetic outpatient clinic were collected, part of each in a potassium EDTA-containing tube and another part in a fluoride/oxalate-containing tube. The samples were then analyzed as detailed by Corning. Each pair of samples was electrophoresed on the same gel to avoid between-batch variation. Comparison of the EDTA-containing samples (x) with the fluoride/oxalate-containing samples (y) gave the following linear regression equation:  y = 0.97x + 0.59; r = 0.98. A pair difference t-test gave the following result: mean difference 0.26, S.E. of difference 0.07, t = 3.670 (p < .001). The difference is statistically significant, but too small to affect clinical interpretation of the results. Consequently, we have started estimating both glucose and HbA1 in fluoride/oxalate-treated samples. This has the obvious advantage to the patient of requiring the withdrawal of only one 5-ml sample.

Fiona M. Sinclair
Derek J. MacDonald
Biochem. Dept.,
Raigmore Hospital,
Inverness, IV2 3UJ, U.K.

"Alpha" and "Beta" Errors

To the Editor:

Javier Fuentes (Clin. Chem. 28:2329, 1982) is correct when he questions what is meant by an alpha error and a beta error. The definition used by statisticians is the correct definition. An alpha error, or a Type I error, is a false-positive result.

In our book, Beyond Normality (1), we followed the teachings of Lee B. Lusted (2), who turned the classical statistical definition on its head and defined a false-positive result as a beta error!

Lusted now prefers not to use the terms "alpha" and "beta" errors. It is better to simply speak of "true-positive" fractions and "false-positive" fractions.

References


S. Raymond Gambino
MetPath Inc.
Teterboro, NJ 07608

Robert S. Galen
Cleveland Clinic
Cleveland, OH 44106

Dehydroepiandrosterone Sulfate Concentrations in Plasma of Normal Ovulatory Women

To the Editor:

Internists and gynecologists utilize plasma dehydroepiandrosterone sulfate (DHEA-S) measurements widely in evaluating conditions involving adrenal androgen excess. In this application, DHEA-S measurements have largely replaced the traditional measurement of 24-hour urinary 17-ketosteroid excretion (1). Because information on normal DHEA-S concentrations may be of major importance in the exclusion of serious endocrine disorders—including Cushing's disease and syndrome, adrenal tumors, and congenital adrenal cortical hyperplasia (2)—it is important that the normal reference interval for DHEA-S concentrations be known as precisely as possible and that supranormal values be easily recognized in women of reproductive age.

DHEA-S concentrations may be increased or depressed under conditions that are unrelated to these serious diseases. They may be low in postmenopausal women, elderly men, patients taking glucocorticoids, underweight individuals, and in women of reproductive age who have had oophorectomies and are not taking estrogens (3). They may be high in reproductive-age women who are anovulatory and overweight in association with polycystic ovarian disease (3). Because DHEA-S concentrations are so easily affected by these conditions, it is difficult for reference laboratories to establish their own normal reference intervals by use of data on ostensibly normal women without first subjecting each of them to an expensive and impractical medical and gynecological screening. Consequently, reference laboratories are frequently finding "normal" values in excess of 5 μg/L, a range we believe to be excessively high.

We therefore evaluated a group of gynecologically normal, regularly ovulating women of normal body mass. We wanted to establish a normal reference interval in gynecologically healthy, nonobese, ovulating women that could be reproduced and used as a reference by other laboratories that are providing DHEA-S measurements.

The subjects were 17 healthy ovulating women of normal body mass, ranging in age from 20 through 35 years. Each woman had been studied during three to seven cycles with respect to daily basal body temperatures, serum estradiol concentrations, and serum lutinizing hormone concentrations, with careful documentation that each had long been normally ovulatory. None of the women had hirsutism, significant acne, or abnormal gynecological examinations.

DHEA-S concentrations were measured with a standard 125I radioimmunoassay kit obtained from Immucor Corp. (Division of Radioassay Systems Laboratories, Carson, CA 90746, cat. no. 11014). The assay was used as instructed. We compared results with this kit with those by a tritiated DHEA-S assay described by us previously (5). Seventeen samples were used in this comparison; the results, tabulated below, show no systematic difference (p = 0.19, signed-rank test).

<table>
<thead>
<tr>
<th>Mean concn, μg/L</th>
<th>x y</th>
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<tbody>
<tr>
<td>2.056</td>
<td>1.932</td>
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<tr>
<td>0.9555x + 0.107</td>
<td>(r = 0.9722)</td>
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DHEA-S concentrations in the plasma of the 17 women ranged from 0.700 to 3.900 μg/L (mean 2.056, SD 0.859 μg/L).

We suggest that manufacturers of DHEA-S kits supply user laboratories with a normal reference interval for a similarly screened group of subjects.

References