Prolactin Concentrations in Serum Unchanged in Transient Global Amnesia

To the Editor:

Transient global amnesia (TGA) has been defined as the abrupt onset of the inability to store new memories, associated with transient or permanent retrograde amnesia without other neurological signs and symptoms. Although its etiology is uncertain, the two theories proposed most often are epileptogenic and ischemic causes. The abruptness of onset and the reversibility of the episodes, coupled with the occasional abnormalities in the electroencephalogram, led to suspicions that it is a form of epilepsy (1-3).

Prolactin concentrations in serum increase after electroconvulsive, generalized tonic-clonic, or complex partial seizures. Modulation of hypothalamic function by epileptic discharges has been postulated (4-8). We know of no previous reports concerning the concentrations of prolactin in serum in episodes of TGA.

We determined serum prolactin in three women who were suffering episodes of TGA. All criteria for TGA (9) were present at the time of the episode: (a) transient amnesia attack with no direct relation to craniocutaneous trauma, (b) evidence given by a witness of the inability to store new memories, (c) repetitive queries, (d) apparently normal behavior and orientation, (e) evidence given by a witness of normal long-term memory, and (f) presence of retrograde amnesia at least during the episode. We used a double-antibody RIA kit (Travenol Labs., Morton Grove, IL), with which the normal mean value for prolactin measured in our laboratory (n = 95) is 12.3 μg/L (SD 3.7 μg/L).

Three serial determinations were made at 10-min intervals: during the episode, immediately after the episode, and within 15 days of the episode. One of us re-evaluated the patients at 15-min intervals during the episode. We considered that the episode was finished when no short-memory disturbances were demonstrated on two serial evaluations. Table 1 summarizes the prolactin values of the patients.

We found no increased values for serum prolactin in any of these patients. Although a normal post-ictal value does not totally exclude epileptic seizure, an increased value for serum prolactin is considered to be a sensitive indicator of recent epileptic seizure (8). Thus our results make epilepsy a less appealing possibility for the etiology of TGA.

References

Jorge Matias-Guiu1
Carmen Garcia1
Luis Galdos3
Agustin Codina1

Neurology and Lab. of Nuclear Med.2
C. S. Vall d’Hebrón
Universidad Autónoma
Barcelona, Spain

Serum Fructosamine and Assay pH

To the Editor:

We find that assay of serum fructosamine provides a precise, rapid, and inexpensive means of monitoring glycemic control. The assay conditions as originally described by Johnson et al. (1) included a reaction pH of 10.80 and gave a mean reference interval of 1.6 (2 SD 0.40) mmol/L (2). No allowance was made for activity of the albumin blank solution in preparation of their standard curve. Our studies (3) based on the conditions of Johnson et al. gave a similar reference interval 1.56 (2 SD 0.24) mmol/L, but only after we made allowance for the significant activity of the albumin blank solution.

In the New Zealand group’s most recent publication (4) the pH of the assay is stated as being 10.35, but with no explanation for this change. We have therefore compared the results of the fructosamine assay at these two pH values (both with albumin blank correction in the standard curve) and report here a significant change in the reference interval given by the assay at lower pH. In a group of 100 nondiabetic ambulatory subjects (mean age 46, range 17 to 65 years) we determined a reference interval of 2.24 (2 SD 0.66). The reason for this difference is that 1-deoxy-1-morpholino-fructose standards and serum give proportionately different activities with changing reaction pH, an effect we have noted previously (3). Moreover, use of the lower assay pH seems to give better discrimination between groups of diabetic and nondiabetic subjects as judged by the greater separation at pH 10.35 of the mean fructosamine values for 80 ambulatory insulin-dependent diabetics and 100 ambulatory outpatient nondiabetics:

<table>
<thead>
<tr>
<th>Fructosamine, mmol/L</th>
<th>pH 10.35</th>
<th>pH 10.80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetics</td>
<td>Mean (XD)</td>
<td>3.30</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>0.81</td>
</tr>
<tr>
<td>Nondiabetics</td>
<td>Mean (XND)</td>
<td>2.24</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>0.33</td>
</tr>
</tbody>
</table>

[(XD - XND)/(XND)] = 47% at an assay pH of 10.35, 32% at pH 10.80. We recommend therefore that an assay pH of 10.35 be used for the determination of serum fructosamine.

References

Table 1. Serum Prolactin Concentrations in Three Patients

<table>
<thead>
<tr>
<th>Age, yr</th>
<th>Duration of episode, h</th>
<th>During the episode</th>
<th>After the episode</th>
<th>Within 15 days of the episode</th>
</tr>
</thead>
<tbody>
<tr>
<td>57</td>
<td>3</td>
<td>3.4</td>
<td>4.2</td>
<td>2.9</td>
</tr>
<tr>
<td>68</td>
<td>12</td>
<td>3.5</td>
<td>4.1</td>
<td>3.1</td>
</tr>
<tr>
<td>27</td>
<td>14</td>
<td>1.3</td>
<td>1.0</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.3</td>
<td>1.4</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.4</td>
<td>1.9</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.6</td>
<td>3.4</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.3</td>
<td>6.8</td>
<td>8.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.5</td>
<td>5.9</td>
<td>8.1</td>
</tr>
</tbody>
</table>
Salicylate Procedure for the Cobas-Bio Analyzer

To the Editor:

The salicylate method commonly used in many laboratories involves Trinder's reagent. Although its nonspecificity has been demonstrated, especially in Reye's syndrome (1), this method still provides useful clinical information in many routine and especially in emergency situations.

I have adapted a micro-scale Trinder method (2), which depends on the formation of a ferric-ion-specific complex, for use with Roche Laboratories' Cobas-Bio centrifugal analyzer. The method is rapid, 25 patients' samples can be assayed in 6 min, and current reagent cost is less than 0.5¢ per assay. The reagent and standard are stable for at least three months when stored at 2 to 8 °C.

Working reagent: Dissolve 1 g of Fe(NO3)3·9 H2O in 100 mL of nitric acid (70 mmol/L).

Stock standard: Dissolve 1.16 g of sodium salicylate in 1 L of water.

Working standard: Dilute 20 mL of stock standard to 100 mL with deionized water (final concentration, 0.2 g/L). A commercially-prepared standard for salicylates works just as well (e.g., calibrator, from Du Pont Instruments, Wilmington, DE 19898).

The Cobas-Bio settings are as follows:

1. Units = g/L
2. Calculation factor = 0
3. Standard 1 concn = 20
4. Standard 2 concn = 10
5. Standard 3 concn = 0
6. Limit = 70
7. Temp, °C = 25.0
8. Type of analysis = 1
9. Wavelength, nm = 535
10. Sample vol, µL = 10
11. Diluent vol, µL = 40
12. Reagent vol, µL = 50
13. Incubation time, s = 0
14. Start reagent vol, µL = 0
15. Time of first reading, s = 10
16. Time interval, s = 10
17. No. readings = 3
18. Blank mode = 1
19. Printout mode = 1

The precision of the method is good (Table 1), and results (y) correlated well with those by the Du Pont method (x); \( y = 0.979x - 0.004 g/L \) \( r = 0.971, n = 30 \). The signal response for this method varies linearly with concentration to 0.7 g/L, giving a regression line slope of 0.11, an intercept of 0.002, and a correlation coefficient of 0.989.

For analytical-recovery studies, we added salicylate in four different concentrations (0–0.7 g/L) to pooled serum containing no salicylate. The mean recovery was 100.1% (SD 0.81%) as calculated from five analyses of each sample.

This method is rapid, precise, accurate, and inexpensive. The 10-µL sample required per assay makes it well suited for use with pediatric patients if certain considerations are made regarding its lack of specificity in certain situations. We have used this method for two years and find it very acceptable.

Table 1. Precision of the Method at Two Concentrations

<table>
<thead>
<tr>
<th>Salicylate concn, mg/L</th>
<th>Mean</th>
<th>SD</th>
<th>CV, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within-run (n = 10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>0.7</td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>226</td>
<td>1.8</td>
<td>0.78</td>
<td></td>
</tr>
<tr>
<td>Between-run (n = 5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>1.6</td>
<td>6.4</td>
<td></td>
</tr>
<tr>
<td>227</td>
<td>2.5</td>
<td>1.1</td>
<td></td>
</tr>
</tbody>
</table>

To the Editor:

I have decreased the minimum concentration of thyrotropin (TSH) detectable with the "TANDEM®-R TSH" assay (cat. no. 3153; Hybritech Inc., San Diego, CA 92121) from 0.4 to 0.05 milli-int. unit/L. The factor most affecting the lower limit of detection in this immunoradiometric assay is imprecision in the radioactivity count rate (counts/min) of the low calibrators. I found that a variable amount of 125I-labeled antibody remained on the walls of the assay tube after the prescribed washing procedure. When the washed beads are transferred to clean tubes and washed once more, and the counting time is prolonged to 10 min, then there is less imprecision in the counts for the low calibrators.

In one typical assay, the mean counts/min for 30 zero calibrators after the prescribed washing procedure was 1212 (SD 102.2); after the modified washing procedure, it was 1026 (SD 12.4). The rate of change of the count rate was 50.8 per 0.1 milli-int. unit/L—corresponding to a minimum detectable concentration of 0.4 milli-int. unit/L for the improved bead wash and 0.05 milli-int. unit/L afterwards.

We have used this assay, with only the 0, 2, and 10 milli-int. units/L calibrators plus the modified bead-washing procedure in our laboratory for more than a year, analyzing approximately 1500 patients' samples. The long-term quality-control precision statistics for this assay at a low concentration are \( \bar{x} = 1.29 \) milli-int. unit/L, \( CV = 6.7\% \), \( n = 34 \). The reference range, derived from data from 100 normal individuals, ages 19–85 years and equally divided between the sexes, is 0.5–3.5 milli-int. units/L. Clinically, the assay clearly distinguishes euthyroid from thyrotoxic patients, who usually have thyrotropin values <0.05 milli-int. unit/L. Also, the improved precision at low concentration is helpful when the thyrotoxin stimulation test is also being done.

I much prefer the two-step "TANDEM®-R TSH" assay over the more usually supplied one-step kit. I was unable to improve, to the same extent, the minimum detectable dose with the latter kit. However, the type of approach I have taken with the two-step TSH kit has been successfully applied to other Hybritech TANDEM kits, to measure low concentrations of chorionic gonadotropin and alpha-fetoprotein.

Don Landek
Dept. of Pathol. and Lab. Med.
Olympic Fields Osteopathic Med. Ctr.
20201 South Crawford
Olympia Fields, IL 60461

Low Thyrotropin Concentrations As Measured with a Commercial Kit

Calibration of Direct Ion-Selective Electrodes for Plasma Na+ to Allow for the Influence of Protein Concentration

To the Editor:

Direct-reading ion-selective electrodes (ISE) analyze from different manufacturers often give different values for sodium in the same specimen of plasma (1). Some of these instruments consistently give results differing from those obtained by such indirect methods such as flame photometry. To com-