results in creatinine results determined with either the aca or ASTRA systems could be substantial. Phenacemide can cause renal disease and is hepatotoxic (7), so an accurate creatinine result is important to appropriate management of patients receiving this drug.

References

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Chemical and Atomic Absorption Methods for Thallium in Urine Compared

To the Editor:

During the past three years, several cases of thallium poisoning have been seen at the American University Medical Center in Beirut. The largest number of victims came from a family in Sidon that had accidentally (?) ingested rat poison. At that time we did not possess a TI hollow-cathode lamp for our Perkin-Elmer Model 303 atomic absorption spectrophotometer. Ordering a lamp from the United States would require several months, so we resorted to an adaptation of the chemical method of Rieders (1) for estimating TI in the urine of these patients. The method involves oxidation with Br₂ followed by extraction with benzene of the methyl violet complex of TI and its subsequent spectrophotometry. We mixed 5 mL of urine with 1.5 mL of 6 mol/L HCl and 1 mL of freshly prepared Br₂ water. After the mixture had stood for 5 min, excess Br₂ was destroyed with 1 mL of a 200 g/L solution of sulfosalicylic acid. This was followed by 0.25 mL of 2 g/L methyl violet, and the mixture was shaken with 5 mL of benzene. The absorbance of the benzene layer was measured at 610 nm. Blank and standards were prepared by substituting urine for aqueous solutions of TINO₃ containing 0 to 20 mg of TI per liter. Absorbances were proportional to concentration within that range. We noted that several normal urines produced a weak coloration, which indicated that urine can contain positive interfering substances. Analytical recoveries were 87 to 101% for TINO₃ added to urine to give a final TI concentration of 5 mg/L. Hospitalized patients were treated with potassium ferrocyanide (2) and their urinary excretion of TI was followed with time. The patient with the highest initial output (31.9 mg/day by the chemical method) required four days to decrease the daily urinary excretion by half while on therapy with potassium ferrocyanide.

When the hollow-cathode lamp did arrive we were able to compare results by the spectrophotometric and atomic absorption (3) methods. The urine specimens had been preserved by acidification with HCl.) Figure 1 shows the results of that comparison. The data include control (normal) urines and a followup of three patients. Linear regression analysis gave the equation y = 1.40x + 1.91 (r = 0.984, n = 32). There was poor correlation at low TI concentrations. An equivolume ratio of organic to aqueous phase was used in
the extraction procedure before atomic absorption. Not having a graphite furnace, we aspirated the isobutylmethyl ketone layer directly into the flame. Ammonium pyrrolidine dithiocarbamate and sodium diethyl dithiocarbamate were equally effective in chelating TI. We found, moreover, that direct aspiration of the aqueous solutions into the flame (4) was six times less sensitive than use of an organic-extraction step.

Although the colorimetric method of Rieders is more subject to interference than the atomic absorption method, we conclude that it is a valid semiquantitative screening procedure in laboratories that do not possess an atomic absorption spectrophotometer.

References

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Digoxin-Like Immunoreactivity in the Serum of Neonates and Uremic Patients, as Measured in the Abbott TDX

To the Editor:

In recent reports on the presence of an interfering digoxin-like immunoreactive substance (DLIS) in the sera of neonates and uremic patients not taking digoxin (1–4), the degree of interference with measurement of digoxin was investigated with RIA and enzyme-immunoassay methods. Many laboratories currently are measuring digoxin with the Fluorescence Polarization TDX System (Abbott Laboratories, Diagnostics Division, North Chicago, IL 60064), so the degree of interference of DLIS with this system is of interest.

We obtained cord blood from 30 neonates who were not receiving digoxin and measured for DLIS by fluorescence polarization and by RIA, using kits from Kallestad Inc., Austin, TX 78701; Clinical Assays, Cambridge, MA 02139; and NML Laboratories, Irving, TX 75061. The results (Figure 1) indicate that the degree of interference by DLIS was the least with the TDX, greatest with the NML RIA. The latter result concurs with previous reports (1, 2). Similar results were found with different lots of TDX digoxin reagents, which reflects little lot-to-lot difference in antibody specificity.

We also tested for DLIS in the sera of 25 uremic patients who were not receiving digoxin but whose serum creatinine was at least 1.5 times the upper limit of normal, with both the TDX and the Kallestad RIA. The apparent DLIS concentration was consistently <0.28 μg/L by either method. There was no correlation between DLIS as measured by the TDX and creatinine concentration (ρ >0.05), which is similar to the findings of others (4) for RIA of digoxin.

We conclude that DLIS can be detected by the TDX in the sera of neonates and uremic patients who are not receiving digoxin, but the degree of interference is generally less than that seen in commonly used RIAs for digoxin. As a result the TDX will give more nearly accurate values for digoxin in such patients.

References

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Removal of Ammonia from Urine by Tetraphenylboron before Amino Acid Analysis

To the Editor:

Ammonia seriously interferes with the accurate quantification of some amino acids in urine in methods involving o-phthalaldehyde/2-mercaptopethanol (OPA/MCE) pre-column derivatization and reversed-phase "high-performance" liquid chromatography (HPLC) (1, 2). However, because the ammonia OPA/MCE derivatives are highly unstable and have a fluorescence intensity of only about 1% of that