Acetazolamide Interference with Theophylline Analysis by High-Performance Liquid Chromatography

To the Editor:

Drug interferences with theophylline analysis by the Schack and Waxler ultraviolet method (1) are well known (2). It now appears that direct analysis for theophylline by HPLC is also subject to numerous interferences. Kelly et al. reported (3) interference by cephalosporin antibiotics with their method, in which a Partisil 10 ODS column is used. Ampicillin and methicillin (4) also interfere.

We analyzed for theophylline in serum by the following procedure: Serum is diluted with an equal volume of acetonitrile containing \( \beta \)-hydroxyethyltheophylline as internal standard. This solution is vortex-mixed, centrifuged, and analyzed for theophylline as described by Orcutt et al. (5).

Recently, three patients’ sera exhibited off-scale readings for theophylline.

Fig. 1. Activity of acid phosphatase

(a) in serum of 207 male infants and children. The difference of values between age groups is significant (\( P < 0.001 \), analysis of variance) (b) in serum of 159 female infants and children. The difference of values in age groups is not significant, although very close to the 5% limit.

The relation of alkaline and acid phosphatase activities to age is similar and corresponds to phases of rapid bone-growth in different periods of life. We conclude, therefore, that acid phosphatase is also mainly of osteogenic origin in childhood.

References


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acetazolamide to drug 3.


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Lithium Anyone?

To the Editor:
Our laboratory was recently given the assignment of determining lithium in serum. The only instrument that we had available that could possibly be used was an IL 143 flame photometer that was retired from routine use for sodium and potassium determinations. The company said that it would cost over $1000 to give the instrument lithium capability, and that it might not even be possible, but we decided we had nothing to lose if we made an attempt. By simply interchanging the potassium and lithium photocells, and placing a damping filter (wire-mesh screen) before the potassium photocell, our flame photometer was ready to determine lithium.

We took 200 mL of a lithium standard and diluted with 5 mL of a potassium internal standard solution (4 mmol/L). The lithium concentration is plotted on a graph vs. the reading on the potassium readout. Reading vs. concentration is linearly related to at least 1.44 mmol of lithium per liter. A comparison of results on 20 patients, atomic absorption vs. the flame photometer, gave a correlation coefficient of 0.98.

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Evaluation of Tests for Fecal Occult Blood

To the Editor:
I have several comments on the article in Clinical Chemistry, 24, 756–761 (1978), in which Adlercreutz et al. compare the sensitivity of “Fecatest” with that of “Hemoccult,” “Hematest,” and several test-tube reactions for the detection of fecal occult blood. The points requiring clarification are as follows:

1. The authors' claim that Fecatest is less sensitive than Hematest does not seem to be supported by their data. Their in vitro studies (Table 2 of the article) show complete agreement between Fecatest and Hematest in the detection of 1885 negative and 300 positive specimens out of a total of 2463 tests. An additional 84 specimens were detected as positive by Fecatest. If my calculations are correct, this means that the sensitivity of Fecatest was equivalent to or greater than Hematest in 92% of all specimens tested.

2. The statement that “... some batches of the peroxide reagent were devoid of peroxide” is inconsistent with our stability data. Hemocult developer will retain its peroxide content for four years when properly stored, i.e., protected from light, heat, and stored tightly capped. One can only guess that their developer was either outdated or had been stored improperly.

3. A change in the type of guaiac used in Hemocult manufacture resulted in a decrease in the color of the impregnated paper. This, however, was not accompanied by a concomitant loss in sensitivity. On the contrary, the whiter background and new guaiac have resulted in better readability and, consequently, a slightly greater sensitivity.

4. The instructions for the development of Hemocult have been changed to include the application of a drop of water before the peroxide solution is added. The water is to be added to the same side of the paper to which the developer is placed, not to the specimen side as stated by Adlercreutz et al. Rehydration of the specimen reduces the number of falsely negative reactions due to storage (1) and has been shown to result in an apparent increase in sensitivity. The mechanism by which specimen rehydration accomplishes this is currently being investigated.

The Hemoccult is an effective, sensitive, reliable, and esthetically acceptable means for the detection of fecal occult blood is well documented in about 60 publications. The reproducibility of Hemoccult has also been shown by Adlercreutz et al., who report Hemoccult to be 97% effective, as compared to 95% with Fecatest and 74% with Hematest.

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References

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The authors of the paper in question offer the following response:

To the Editor:
Dr. Wells asks for clarification of some points in our article on "Fecatest." Our comments are as follows:

1. The way in which Dr. Wells tries to demonstrate, using the values of our Table 2, that "Fecatest" is not less sensitive in vivo than "Hematest" is in our opinion not adequate. A mathematical evaluation of the difference in sensitivity of two tests cannot be based on calculations that include all the completely negative test results, which in this case formed 77% of the total. From Table 1 in our article it can be seen that Hematest gave 40% more positives in vivo than Fecatest, and from Table 2 a similar calculation reveals 29% more positives for Hematest than for Fecatest. In the 51Cr-erythrocyte studies shown in Table 3 we found 100% more positives by Hematest than by Fecatest. Table 3 is the most important if one wishes to know the in vivo sensitivity of the tests for bleeding from the colon.

According to the manufacturers, the greatest dilution of blood for which Hematest is detectably positive is 1:20 000, but for Fecatest the threshold for a positive result is, in our hands, at the much smaller dilution of 1:8000. Thus it can be concluded that Fecatest is less sensitive than Hematest.

2. Dr. Wells does not mention that the composition of the Hemocult developer has been changed since we started our work in 1972. We have not said that the developer produced nowadays is unstable, but the old one obviously was. The developer now contains some (or more?) alcohol, which seems to make it more stable. The developers that did not contain peroxidase...