A Better Method for Eliminating Salicylate Interference with Measurement of Acetaminophen

To the Editor:

Acetaminophen is available in many proprietary combinations with aspirin (acetylsalicylic acid) and salicylamides (1,2), so any method for acetaminophen measurement should be free from interference by aspirin and its related compounds. Reed et al (3) recently reported that a commercial kit method for acetaminophen analysis ("RAPID Stat Kit"; Lancer Division of Sherwood Medical, St. Louis, MO 63101) suffers from a significantly stronger positive interference by salicylate than was indicated in the package insert.

Salicylamide, the drug most commonly combined with acetaminophen in "aspirin-free" analgesics, is readily hydrolyzed to salicylaldehyde. Both salicylamide and salicylate interfere positively with nitration methods (4).

A direct acid/ferric reduction method for acetaminophen that is free of interferences by salicylate and salicylamides was reported earlier by Liu and Oka (5). In this method a complex of ferric 2,3,6-tris-(2-pyridyl)-S-triazine is reduced to the ferrous complex by the phenolic hydroxy group of acetaminophen. Aspirin does not interfere because its hydroxy group is acetylated and therefore the compound does not have a phenolic hydrogen to donate as an active reducing agent Table 1. The potential reducing hydrogens of the phenolic groups of salicylate and salicylamides are both stabilized by internal hydrogen bonding to the oxygens of the carboxyl and amide groups, respectively. These stabilizations explain the minimal interference observed with this method for acetaminophen (Table 1). In the therapeutic concentration range for salicylate and salicylamides (<50 mg/L) in serum, neither reagent interferes with the method, and even at toxic concentrations (600–1000 mg/L) the three nitratable aspirin-related compounds yield negligible positive interference.

Moreover, the method is rapid (approximately 15 min with the manual technique); involves stable, safe reagents; and is comparatively free of interferences. Thus, we recommend it for consideration by laboratories that analyze for acetaminophen.

References

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Creatine Kinase B-Subunit Activity in Serum in Cases of Suspected Myocardial Infarction: A Prediction Model Based on the Slope of MB Increase and Percentage CK-MB Activity

To the Editor:

Assay for creatine kinase (CK; EC 2.7.3.2) MB isoenzyme by immunological inhibition of the M-subunit activity and measurement of the residual B subunit activity has been extensively evaluated (1–3). This method is simple, fast, and precise, but the requirements for quantitative accuracy, sequential testing, and the recognition of subendocardial infarcts (4) and infarct extension compelled a further investigation in our laboratory.

To minimize errors of conventional diagnostic cutoff values and other procedures that do not optimize for time-dependent changes and variability of the measured results, we utilized receiver operator characteristic curves (5,6) for nonoverlapping time intervals during the course of infarction, noting