placed into a laboratory oven for over-night drying at 50 °C. We currently use an average of 21 rotors per day, which take less than 30 min to wash with less than 10 min of operator time. We find that the rotors can be washed more than 50 times without any problem. We have tested the effectiveness of the washer by measuring absorbance detected after washing cuvettes filled with highly colored food dye and have found the wash process to be thorough.

The total cost of the rotor washer was less than $75. The annual cost savings achieved by washing rotors is enormous: based on our current use of 21 rotors per day it exceeds $16 000 per year.

There are no patents on the rotor washer and the reader is encouraged to use or market the unit. Detailed blueprints of the washer are available from the authors.

References

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Simple Removal of Lipids from Serum

To the Editor:

Lipemia in blood samples is a common problem in the clinical laboratory, and electrolyte management in the acutely ill patient is often complicated by analytical inaccuracies caused by interference by high concentrations of lipids in the serum. For example, hypokalemia and hypocalcemia are hard to gauge in a patient whose serum is milky because of diabetic ketoacidosis. Ultracentrifugation removes lipoproteins and "clears" lipemic samples for accurate determination of electrolytes (1), but this takes several hours and is obviously not appropriate when rapid management decisions are needed.

This experience with ultracentrifuged samples has led to helpful formulas (2) to correct for artificial electrolyte abnormalities due to lipemia, and such corrections are commonly used. We now report a simple, relatively rapid technique for removing lipids from the serum, which permits more accurate determination of non-protein-bound analytes. We found that use of polyethylene glycol (PEG), an inexpensive agent commonly used to precipitate immunoglobulins (3), is effective in removing lipoproteins.

To the serum sample, 1.5 mL or less, in a glass tube, add an equal volume of PEG 250 mL/L. Vortex-mix thoroughly, then separate the two phases by centrifugation (2300 rpm, 20 min). The lipids pass into the PEG (lower) phase, which is now milky white and separated by a sharp interface from the new-clear serum sample. Use this clear supernate for analytic determinations, but multiply the results by two to correct for the dilution.

We used this technique with 15 lipemic samples from patients. The mean cholesterol concentration was 4.06 (SE 0.47) g/L before treatment with PEG and 200 (SE 20) mg/L after. The concentration of triglycerides was decreased to 250 (SE 60) mg/L from 15.07 (SE 2.48) g/L. By comparison, ultracentrifugation for 10 h decreased these values to 1.68 (SE 0.24) g/L and 3.7 (SE 0.62) g/L, respectively.

Table 1 compares values for glucose, urea nitrogen, sodium, potassium, chloride, and bicarbonate in untreated samples, PEG-treated samples, and ultracentrifuged samples. Removal of lipids by PEG markedly increased the values of all analytes. The ultracentrifuged samples tended to show smaller increases, because of the less-complete lipid removal.

We caution that the PEG technique is not appropriate when enzyme activities or protein-bound analytes such as calcium or thyroxin are to be measured in serum.

References

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Short-Term Changes in Iron, Ferritin, Total Iron-Binding Capacity, and Transferrin in Serum after Myocardial Infarction

To the Editor:

As known for many years, hypoferremia follows myocardial infarction (1). More recently, it was suggested (2) that, when used in association with enzyme activity assays, results for serum iron might prove useful in diagnosing myocardial infarction, and that its rapid decrease between 24 and 48 h after admission was in some way associated with stress. However, the standard biochemical stress of an insulin hypoglycemia test did not result in hypoferremia (3). This apparent conflict might merely reflect the time scales of the two studies. We wished to resolve this point and, more importantly, to assess the changes during the first few hours after myocardial infarction because, ideally, any diagnostic test should be applicable as soon as possible after clinical presentation.

We measured iron, ferritin, total iron-binding capacity (TIBC), and transferrin in serum of patients with myocardial infarction during the 48 h after admission. The subjects were 21 patients who were admitted to the Coronary Care Unit and who had given informed consent to have multiple blood specimens collected as part of a trial for a new calcium antagonist drug. There were 19 men, ages 36 to 67 years (mean, 57 years), and two women, ages 62 and 68 years. All were admitted to hospital within 3.5 h of