I radioimmunoassayed the samples for albumin within 2 weeks of collection, to establish a reference result, and assayed the stored aliquots after seven weeks.

Precipitation of albumin in each sample was assessed by comparing the results for albumin in the uncentrifuged aliquot after vortex-mixing, in the supernate after centrifugation, and in the deposit remaining after removal of the supernate (resuspending the deposit in the same original volume of pH 10 buffer). Albumin was precipitated in seven of the 15 samples stored at -20 °C. Centrifugation before freezing neither prevented nor decreased the precipitation of albumin. Albumin concentrations were stable at 4 °C after seven weeks of storage, but some samples stored at room temperature showed decreased concentrations after this interval.

The precipitation of albumin is temperature dependent. Deposits formed in samples at 4 and -20 °C but did not interfere with the assay and did not cause precipitation of albumin at 4 °C.

I conclude that 4 °C is a suitable temperature at which to store urine for albumin assay. If a centrifugation step is required to remove particulate matter, albumin will not be centrifuged down to produce a falsely low result. If the presence of a deposit does not interfere with the assay, storage in the deep-freezer is suitable, but the sample should be vortex-mixed immediately before the assay.

Reference

A Fully Automated Immunoassay for Thyroxin Evaluated, Aimo Harmainen, Pauli Vuorinen, and Hanno Jokela (Consulting Laboratory Labort Oy, Kalevantie 1, SF-33100 Tampere, Finland)

Radioimmunoassay (RIA) is not well suited for automation. Many drug analyses have been automated by using homogeneous immunoassays, but the measurement of serum thyroxin (T₄) is more difficult to automate—partly because of the longer incubation times involved, partly because of the need for three reagents. The Kone Progress analyzer (Kone Oy, Espoo, Finland) is very suitable for the automation of immunoassays: incubation times can be chosen freely, up to four reagents can be pipetted, and the consumption of (expensive) reagents is very small.

We have developed a fully automated application for T₄ measurement using Kone Progress and xmr® reagents (Manual Thyroxin Assay kit; Syva Co., Palo Alto, CA). In brief, 5 μL of serum sample or standard, 15 μL of water, and 20 μL of pretreatment solution (diluted threefold with water) are pipetted and mixed. After incubation for 10 min, 55 μL of reagent A (diluted 10-fold with diluent) is added and the solutions are mixed again. After incubation for 5 min, 60 μL of reagent B (diluted 11-fold with thyroxin buffer) is added; after mixing, the initial absorbance values are measured at 340 nm. After 15 min the absorbances are measured again and the results are calculated from the differences in absorbance. All the above steps the Progress analyzer does automatically.

We have compared the results of this method (y) with those of a conventional RIA (T₄¹²₅ radioimmunoassay kit; Farmos Diagnostica, Farmos Group Ltd., Turku, Finland) (x). The correlation coefficient was 0.931 and the linear regression line y = 0.985x + 4.9 nmol/L (n = 95). Within-day precision (CV) varied from 1.3 to 2.8% and day-to-day precision from 2.3 to 5.2%.

Although the light-path of the instrument is 0.8 cm, the assay volume is only 150 μL. Consumption of the reagents is therefore small and the current cost per test is only $0.50 (U.S.) for duplicates. The capacity of the Kone Progress is about 50 tests per hour. We conclude that this fully automated, highly precise application is a practical and reliable alternative to RIA.


Serum lipase was measured with two immunological methods: a quantitative enzyme immunoassay (I) and a semiquantitative latex agglutination test (2) ("Enzygnost Lipase" and "Rapitex Lipase," respectively; Behringwerke, Marburg, F.R.G.) in patients with acute pancreatitis.

Results for immunoreactive lipase (0–2300 μg/L) were compared with the enzyme activity of triacylglycerol lipase (EC 1.1.1.3) (Boehringer, Mannheim, F.R.G., 263346).

We saw no relation (r = 0.16) between results by the two techniques for the normal range (0–56 μg/L). For values (56–300 μg/L) such as are seen in chronic pancreatitis or in follow-up of acute pancreatitis, the correlation was better (r = 0.68). In early-admitted pancreatitis (>300 μg/L) the correlation improved (r = 0.85). These results were confirmed on studying the evolution of lipase concentrations during follow-up. In these patients the immunoreactive lipase was still above normal, although the enzyme activity lacks sensitivity or was undetectable.

We could establish a relation between the results of the Rapitex-Lipase test and the actual lipase concentration measured by the Enzygnost method. In patients with acute pancreatitis, agglutination occurring within 1 min (++) always corresponded with increased lipase (>650 μg/L). Agglutination occurring between 1 and 3 min corresponded with intermediate lipase values (130–470 μg/L). When time for agglutination exceeded 3 min (+ and ++), the lipase concentration of the sample was always <190 μg/L.

Finally, we observed no interference by rheumatoid factor, monoclonal immunoglobulins, or triglycerides (>7.5 g/ L) in either the enzyme immunoassay or the latex test. Thus these quantitative and qualitative immunochromatographic methods seem to be reliable for use in early diagnosis and follow-up of acute pancreatitis.

References