Immunologically-Derived Pancreatic Amylase, Pancreatic Lipase, and Total Amylase Compared as Predictors of Pancreatic Inflammation, F. Van Lente and S. C. Kazmierczak (1) Dept. of Biochem., Cleveland Clinic Foundation, Cleveland, OH 44195; and 2 Dept. of Clin. Pathol. and Diagn. Med., East Carolina Univ., Greenville, NC 27834)

Immunossays for pancreatic amylase that involve monoclonal antibodies, recently developed as diagnostic markers for pancreatic inflammation, are more specific than, but as convenient as, determining total amylase activity. Determination of pancreatic lipase activity with use of colipase supplementation has also been advocated as an efficient predictor of pancreatitis (1, 2). We compared the diagnostic accuracy of an immunologically derived pancreatic amylase activity for acute pancreatitis with that of total amylase and pancreatic lipase.

Of the 100 patients included in the study, 37 had clinically proven pancreatitis; the rest had various nonpancreatic disorders. Enzyme activities were measured throughout the patients’ hospitalization. Pancreatic lipase and total amylase activities were determined as previously described (3). Pancreatic amylase activity was determined by immunoprecipitation with reagents supplied by Roche Diagnostics, Nutley, NJ 07110. In brief: 200 μL of serum is mixed with 200 μL of a suspension of polymer-bound mouse monoclonal antibody to salivary amylase, incubated for 5 min at ambient temperature, centrifuged (1500 × g, 5 min), and the amylase activity in the supernate, which represents pancreatic amylase activity, is determined by the same method used for total amylase activity.

Twenty-nine (49%) of the 63 patients without pancreatitis exhibited an increased amylase activity of salivary origin, and thus an increased total amylase activity in serum. We investigated the diagnostic sensitivity and specificity of total amylase, pancreatic amylase, and pancreatic lipase for acute pancreatitis, using ROC curve analysis. The curves (Figure 1) illustrate the diagnostic sensitivity and specificity for the peak activity of each enzyme at various cutoff activities. These curves indicate that either pancreatic amylase or lipase is a more effective predictor of acute pancreatitis than is total amylase. The difference between pancreatic amylase and lipase was not significant.

The maximal diagnostic efficiency attained by cutoff adjustment was 0.78, 0.93, and 0.94 for total amylase, pancreatic amylase, and lipase at cutoff activities of 400, 180, and 800 U/L, respectively. At these cutoff values, pancreatic lipase exhibited a sensitivity of 0.89 and a specificity of 0.97, compared with a sensitivity of 0.89 and a specificity of 0.91 for pancreatic amylase. These cutoff activities are respectively three- and fourfold the corresponding upper reference limit for pancreatic amylase and lipase. Parallel testing in which we used combinations of two enzyme tests did not significantly improve the performance over that observed for pancreatic amylase or lipase alone.

Evidently, pancreatic lipase and pancreatic amylase are equivalent markers for acute pancreatitis when appropriate diagnostic cutoff values are used, a conclusion similar to that when pancreatic lipase was compared with the determination of P3 isoenzyme by electrophoresis (I). We conclude that determination of pancreatic lipase alone suffices for the enzymatic diagnosis of acute pancreatitis. Determination of total amylase for this purpose should be discouraged.

References

False-Positive Urine Amphetamine Screen with Rittodrine, Allen Nice and Andrew Maturen (Univ. of Illinois at Chicago, Dept. of Med. Lab. Sciences and Hosp. Clin. Labs., 808 South Wood Street, 693 CME, Chicago, IL 60612)

As substance abuse during pregnancy becomes a recognized risk factor in infant prognosis, screening for drugs of abuse in the urine of pregnant women and neonates has become common. To prevent labeling of patients as drug users, care must be taken to ensure that false positives are minimized. Immunossays in general and immunossays for amphetamine in particular are known to cross-react with structurally related compounds (1, 4). Knowledge of potential sources of false positives is important in the interpretation of drug-screening results.

A urine specimen from a patient in labor was submitted for a drug screen. Earlier, the patient had been administered Yutopar (ritodrine hydrochloride in sterile solution; Astra Pharmaceutical Products, Inc., Westborough, MA 01581), a beta sympathomimetic amine, for the management of preterm labor. Yutopar is initially administered intravenously and is used to increase gestational time by decreasing uterine contractile activity (2). All of the immunosassay tests were negative except for the ADx amphetamine/methamphetamine assay (Abbott Laboratories, Diagnostics Division, North Chicago, IL 60064), which produced