SHORT COMMUNICATION

In Vivo Interference of Heparin Bolus Injection with Photometric Continuous Lipase Determination

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Summary: The new photometric lipase determinations use diacylglycerols as substrates in a micellar solution, whereas the turbidimetric method is based on emulsified triacylglycerols degradation. Extrahepatic lipoprotein lipase, which is well known to be liberated by heparin from the capillary binding sites, may cleave triacylglycerols as well as diacylglycerols. When a heparin bolus injection is given to a patient, the released lipoprotein lipase renders high lipase activities in blood misleading for a pancreatic disorder.

Introduction

Elevated activities of serum lipase\(^1\) have a high diagnostic specificity for pancreatic disorders if the assay system contains the cofactors colipase, bile salt and Ca\(^{2+}\) (1). In most routine laboratories, a turbidimetric test system is used with emulsified triacylglycerol as a substrate. This test system exhibits several weak points: poor linearity, narrow measuring range, unexplained increases of absorbance in some patients' samples and an instable substrate emulsion. Test kits with the substrate 1,2-diacylglycerol instead of triacylglycerol have, in contrast, several advantages and may be easily adapted to automated analyzers (2–5). The previously published evaluations of these kits confirmed the high diagnostic specificity for acute pancreatitis and other pancreatic diseases (4, 5). Triacylglycerol concentrations > 4.5 mmol/L, however, are reported to interfere with one of these lipase assays.

Materials and Methods

Based on unexplained elevations of lipase found in patients with acute myocardial infarction, we studied the effect of heparin bolus injections on plasmatic activity of lipase\(^1\). The test kit Sera-Pak\(^2\) from Bayer Diagnostics, München (3, 4); similar to the Wako test kit) was used and the tests were done with heparin plasma.

Results

Table 1 presents a clear increase of lipase activity in each patient after heparin injections. High dosage (5000 U) leads to a higher relative increase than low dosage (2500 U).

Discussion

Human lipase is mainly derived from pancreas (pancreatic lipase), liver (hepatic lipase) and extrahepatic endothelial cells (lipoprotein lipase). These lipases are biochemically closely related and have isoforms. The lipoprotein lipase\(^1\) degrades triacylglycerols of chy-

\(^1\) Enzymes:
Lipoprotein lipase (EC 3.1.1.34)
Lipase (triacylglycerol acylhydrolase, EC 3.1.1.3)

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References


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