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Isoenzyme patterns of gamma-glutamyl transferase in Chinese patients with liver diseases

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In the serum, three different isoenzymes of gamma-glutamyltransferase (GGT) could be separated by electrophoresis on cellulose acetate and stained by using gamma-glutamyl-p-nitroaniline as the substrate. They were located in the alpha 2, beta, and gamma regions, and were tentatively named GGT_a, GGT_b, and GGT_c, respectively. In normal Chinese subjects, the major GGT isoenzyme was GGT_b and hardly any other two isoenzymes could be detected. Besides the GGT_b, the following isoenzymes was noticed in Chinese patients with liver diseases. The GGT_a was appeared during acute hepatitistage. Both GGT_a and GGT_c also could be detected in chronic hepatitis. Those GGT_a and GGT_c each represented around 10—20% of the total GGT in hepatitis. In the patients with hepatoma, the three isoenzymes were all present on the electrophoresis patterns. Most of the time, each of the additional bands, namely GGT_a and GGT_c, was over 20% of the total GGT in hepatoma. The entities of those isoenzymes remain to be elucidated. The method, however, can be used to study hepatic diseases and offers a differential diagnostic aid.

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Activation and inhibition of fibrinolytic enzymes

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Mammalian blood contains an enzymatic system capable of dissolving blood clots, which is called the fibrinolytic enzyme system. The system comprises a proenzyme plasminogen which can be activated to the active enzyme plasmin and is counterbalanced by inhibitors.

Plasminogen activation in blood may occur via an activator which originates from tissues or from the vessel wall and is released into the blood by certain stimuli. Plasminogen activator (PA) has a high affinity for fibrin and the presence of fibrin strikingly stimulates the activation of plasminogen by PA.

The two-chain plasmin molecule is composed of a heavy chain or A-chain (containing structures, called lysine-binding sites, which are important for the interaction with fibrin and with α_2-antiplasmin, the physiological plasmin inhibitor in plasma) and a light chain or B-chain (containing an active site similar to that of trypsin).

Inhibition of fibrinolysis may occur at the level of the activators or at the level of plasmin. From the different half-life of PA in vivo and in vitro it can be deduced that a significant amount is cleared in vivo by mechanisms other than neutralization by plasmatic inhibitors. The inhibition rate of plasmin by α_2-antiplasmin is strongly dependent on the availability of free lysine-binding sites and a free active site in the plasmin molecule.

In plasma, no systemic plasminogen activation by tissue PA occurs and plasmin, if formed is efficiently neutralized by α_2-antiplasmin. When fibrin is formed, PA and plasminogen are absorbed to it and activation becomes efficient. Plasmin generated on the fibrin surface has both its active site and lysine-binding sites occupied and is only slowly inhibited by α_2-antiplasmin. The fibrinolytic process thus seems to be triggered by and confined to fibrin.

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Renin-angiotensin-aldosterone system during chronic diuretic therapy in essential hypertension

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The effect of chronic treatment with hydrochlorothiazide (HCTZ) or tienilic acid (TA) on plasma renin activity (PRA), plasma angiotensin I (PA I) and angiotensin II (PA II) concentration, and on plasma aldosterone concentration (PAC) was investigated in 14 patients with essential hypertension. After an initial run-in period on placebo, the patients entered a double blind study where in group A ($n = 5$) a fixed dose of TA (250 mg), in group B ($n = 5$) a weekly doubling dose of HCTZ (25, 50 and 100 mg) and in group C ($n = 4$) TA (250, 500 and 1000 mg) was administered. In the 5 patients of group A, PRA was increased within 1 week and did not show any further rise. In the patients of group C PRA was increased after 1 week and increased further with doubling doses of TA. The PRA was significantly ($p < 0.01$) related to the daily dose of TA ($r = 0{,}94$).

From the 3rd to the 48st week the patients were treated with a constant dose of either 100 mg HCTZ (B) or 250 mg (A) TA or 1000 mg TA (C). Compared to the run-in period PRA was increased ($p < 0.01$) and no decline in PRA was Seen during prolonged diuretic treatment for up to 48 weeks.

A 2- to 3-fold increase in PA II and PA I was observed during chronic treatment with HCTZ and TA for 3 months. The changes in PA II were related ($r = 0.74$; $p < 0.01$) to the corresponding changes in PRA. PAC was increased ($p < 0.05$) during treatment with 100 mg HCTZ and 1000 mg TA, but not during treatment with 250 mg TA. This increase in PAC was related ($r = 0.68$; $p < 0.01$) to the rise in PA II.

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Improved diagnosis of acute myocardial infarction using a bioluminescent kit for assay of creatine kinase B subunit activity (CK-B)

Karolinska Institute and LKB-Wallac Bioluminescence Centre

The bioluminescent assay of CK-B combines the sensitivity of ATP monitoring using firefly luciferase with the specificity of immunoinhibition using M subunit inhibiting antibodies. With the optimized CK kits (LKB-Wallac, Turku) the bioluminescent method is as rapid and convenient as the spectrophotometric method and allows the assay of a few U/L with a C. V. of 3—4 %. The present study was performed to see if CK-B levels slightly above those in healthy individuals, i. e. a few U/L, could be utilized in the diagnosis of acute myocardial infarction (AMI).