Pancreatic Function Estimated by Quantitation Technique in Area Scanning

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Pancreatic uptake of $^{75}$Se-Selenomethionine was quantitated by the scintillation scanning. The method established by Arimizu (1969) was applied for quantitation of radio activity in the scanning. The twin-headed Hitachi whole body scanner was used. The pancreas and the liver were scanned with setting a patient in supine position. The outputs of twin-beds were electronically added to give a special dot-scan record. The dot factor is suitably set so that the dots in the scan can be manually counted. The scan was performed in about one hour after the $^{75}$Se-Selenomethionine administration of 3 to 4 $\mu$Ci per kg of the body weight. All dots were summed manually over the area of the pancreas and the liver respectively. The uptake ratio of the pancreas to the liver (P/L) is calculated by dividing the summed number of dots in pancreas by those in liver. The whole body scans were then performed in the same manner and the uptake ratio of the liver to the whole body (L/B) was given. The value L/B becomes the correction factor in case of the patient having hepatic disorders. The value of P/L ratio times L/B ratio give the relative uptake of the pancreas to the whole body (P/B). Thirty five cases were so far studied. The P/L ratios in 8 controls ranged 20–31% (mean 25.5%) while those of 12 cases of the acute and chronic pancreatitis ranged 6 to 25% (mean 13.6%). Six cases of the carcinomas in pancreas gave 4 to 21% (mean 12.2%), and 2 carcinomas of the bile duct gave 10 and 13%. If the hepatic function is damaged, such as the case of the liver cirrhosis, the P/L ratio will give higher value even when the pancreatic function stays normal. To correct these errors, the P/B ratio was also calculated in 11 cases. As the number of the group was small, the results would not show the good statistics. While the P/B ratios of the carcinomas in the pancreas stayed lower value than those of controls, there were no differences between P/B ratios of the pancreatitis and those of controls. Increasing the number of cases, and utilizing the computer instead of manual countings of scan dots, the uptake ratios in better statistics could be obtained.