

were imaged with a scintillation camera.

Results: In 5 normal cases, slightly positive images were seen bilaterally. In some patients of lung cancer with normal adrenal function, moderately positive bilateral images were obtained, which could not be differentiated from adrenal hyperlasia. In the cases of adrenal adenoma, whether it was Cushing's syndrome or primary aldosteronism, markedly positive images were seen on the side of the adenoma, but negative or slightly positive images on the other side.

Characteristic unilateral positive images str-

ongly suggest that it could be adrenal adenoma. In 8 cases of adrenal hyperplasia, however, enlarged positive images were seen bilaterally in 5 cases, and also moderately positive in 3 cases. These could not be differentiated from normal cases. In a case of the follow up study of lung cancer, a negative adrenal image on the left side was observed, which had been positive 6 months before. This was later confirmed by autopsy. A metastatic adrenal tumor could be suggested by the process of decreasing radioactivity of I-19-Iodocholesterol.

Pancreatic Scintiphotography in Diabetes Mellitus

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The pancreatic scintiphotography was performed in 108 cases of patients with diabetes mellitus. Scintiphotos were taken at 40 min after intravenous injection of approximately 200 μ Ci of ^{75}Se -selenomethionine using by Toshiba gamma camera. The relationships between the degree of pancreatic uptake of ^{75}Se -selenomethionine and the types and duration of diabetes, vascular complications and the average ranges of fasting blood sugar levels were studied. In some cases, pancreatic scintiphotos were taken at 10, 30 and 50 min. after injection of ^{75}Se -selenomethionine, and the degrees of the pancreatic uptake were compared on each time course. Following results were obtained. (1) Only two out of 24 cases of insulin-dependent diabetics showed normal pancreatic scintiphotos. On the other hand, two out of 47 cases of mild diabetics

treated with diet alone showed no uptake in pancreatic scintiphotos. (2) There was a tendency to show abnormal pancreatic scintiphotos in diabetics of the longer duration of disease. Especially, in 15 cases who had diabetes for more than eleven years, only one case showed normal pancreatic scintiphoto. (3) Abnormal pancreatic scintiphotos were found more frequently in the group of poorly controlled diabetics than in the group of well controlled diabetics. (4) No correlation was found between the uptake of the pancreatic scintiphotos and the presence or absence of the history of drinking and obesity. (5) In cases showing normal pancreatic scintiphotos, diabetic retinopathy was less frequently found. (6) Out of 36 cases of sequential pancreatic scintiphotos, longer diabetic durations, hypertension and arteriosclerosis were found more frequently in

20 cases who showed the delay in reaching a plateau of the activity. But there was no definite correlation between the uptake of

sequential pancreatic scintiphotos and other diabetic conditions.

The Analysis of Calcium and Bone Metabolism in Humans

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According to the recent ICRP report on the alkaline earth metabolism in the adult man, we studied the long term retention of strontium in the whole body.

Four patients with various bone disorders were injected tracer dosis of radioactive strontium intravenously, and the isotope retentions were measured 3 to 24 months.

The data were fitted to the equation which was composed of the exponential and the gamma functions as advocated by ICRP, but was modified by combining the retention in the cancellous and compact bone as a whole.

The parameters of the equation were optimized by the simplex or Powell's direct search method. In order to prevent for the parameters to become negative during their search, the log-normal distribution was assumed for their errors. This assumption was checked by simulating the isotope retention in the whole body, and examining the frequency distribution of the errors of data.

The results on four cases showed that the calculated parameters were closely agreed with the values set as standard by ICRP report.