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CARDIAC POSITRON COMPUTED TOMOGRAPHY (PCT) WITH N-13 AMMONIA IN MAN AND ITS USEFULNESS OF FAST DYNAMIC STUDY. K.Yoshida*, N.Fukuda, H.Ikehira, T.Yamasaki, Y.Tateno, T.Himi*, M.Shukuya*, Y.Masuda*, Y.Inagaki*, The National Institute of Radiological Sciences. *The Third Department of Internal Medicine, Chiba University School of Medicine. Chiba.

The present study was performed to evaluate the myocardial uptake of N-13 ammonia in man. Eight subjects including 2 normals, 3 patients with old myocardial infarction and 3 with hypertrophic cardiomyopathy was selected for the study. Sereial 6-seconds PCT scans for 2 minutes (fast dynamic study were performed after a bolus venous injection of N-13 ammonia.

The results are sumarized as follows:
1.High quality cross-sectional images were obtained from these serial PCT scans.
2.Myocardial time-activity curves were obtained from these serial PCT images and correction for cross-contamination from blood to myocardium were performed.
3.Sum of the two gamma variates could be fitted to measured blood pool time-activity curves with very good agreement.
4.Assuming a two compartment model in a myocardial segment, a computer simulation was carried out to assess the myocardial uptake of N-13 ammonia.

These preliminary results suggest the usefulness of fast dynamic PCT with N-13 ammonia for the evaliation of myocardial perfusion.

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EXPERIMENTAL AND CLINICAL STUDY OF CANCER DIAGNOSIS WITH (F-18) FDG USING POSITRON EMISSION TOMOGRAPHY. H.Fukuda, T.Matsuzawa, M.Ito, Y.Abe, S.Yoshioka and K.Yamada. Tohoku University, Sendai, Japan.

The porpose of this study was to evaluate the validity of cancer diagnosis with (F-18) FDG. Tissue distribution studies and positron imaging studies were made experimentally. We found that (F-18) FDG was a good tracer for cancer detection. The advantages for cancer detection were as follows : (a) The tumor uptake was very high and increased with time. (b) Intrahepatic tumors can be positively delineated, because of rapid clearance from normal liver. (c) The uptake of inflammatory tissue was lower than that of tumor and the uptake level did not increase during the study period.

Based on these experimental results, we studied the feasibility of this diagnostic technic in 7 cases of liver and pancreatic cancers. After injection of 4-10 mCi of (F-18) FDG, serial scanning for every 5 min was performed by positron emission tomography. There were increased accumulation of the radioactivity in either liver or pancreatic cancers with a rapid clearance of the activity from normal liver. By 40-60 min after injection, positive image of tumors were obtained.

From these studies, we concluded that the cancer diagnostic technic with (F-18) FDG can be useful for the location of tumors. Especially, liver tumors were most promising to be examined.

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IMAGING OF THE PANCREAS USING DYNAMIC POSITRON EMISSION TOMOGRAPHY WITH N-13 AMMONIA.
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Dynamic positron emission tomography (PET) with N-13 ammonia was used for the imaging of the pancreas.

Biodistribution of N-13 ammonia was studied in 8 normal mice. Percent injected dose per gram in liver and pancreas were 3.56 and 7.30 respectively at 30 seconds after isotope injection. The pancreas-to-liver ratio was 2.30 at that time.

Two normal volunteers and two patients with pancreatic tumors were studied using dynamic PET with N-13 ammonia. After injection of 10-20mCi of N-13 ammonia, dynamic PET scans were performed every 150 seconds for 30 minutes. Normal pancreas was clearly visualized from the earliest scan, whereas the accumulation of the radionuclides in the liver was much less in the early period.

This dynamic PET study with N-13 ammonia may be useful for the evaluation of various pancreatic diseases.

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A GUIDE LINE FOR THE CLINICAL USE OF Ga-68-MICROSPHERES AS A LIVER SCANNING AGENT.
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We have developed a kit form of new radiopharmaceutical labeling human serum albumin with Ga-68, a generator produced positron emitter. We have finished all of preclinical studies on this preparation.

On the clinical studies, a guide line should be established for security and efficiency of it, urgently.

Today, we have a guide line for the clinical use of radiopharmaceuticals labeled with cyclotron produced positron emitters, but not yet generator produced positron emitters. Referring to the guide line, we examine the items to certify that the radiopharmaceutical will be safe and efficient for clinical use. They are stability of the labeled preparation in vitro, final procedure of this preparation, specific activity, dosis of contamination with non radioactive substance, asepsis, pyrogen, chemical and physical conditions and so on.

It is needed quickly to establish a guide line for the clinical use of radiopharmacuticals labeled with generator produced positron emitters.