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INHOUSE MEDICAL CYCLOTRON (CYPRIS) INSTALLED IN KYOTO UNIVERSITY HOSPITAL. R.Morita and K.Torizuka. Kyoto University. Kyoto.

An inhouse medical cyclotron CYPRIS (Sumitomo), 15 MeV for proton and 8 MeV for deutron and the variable beam current of up to 50 μA, was installed in Kyoto University Hospital in 1982. The manipulation and the maintenance of the entire system is designed to be extremely simple. The operation of the cyclotron, gas synthesis circuits including the quality check systems and the transport of the gasses to the positron camera are performed automatically from a key board and controlled by a micro-computer system.

Clinically sufficient amounts of ^{15}O labelled O_2 and CO_2 could be supplied constantly 10 min after the operation of the cyclotron, 20 min for ^{13}N labelled N_2 and 40 min for ^{11}C-labelled CO and CO_2. All these labelled gasses produced were proved to be sufficient quality for clinical use in the radionuclide, radiochemical and chemical purity.

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POSITRON CT PROJECT IN RESEARCH INSTITUTE OF BRAIN AND BLOOD VESSELS-AKITA. K.Uemura, M.Murakami, I.Kanno, Y.Miura, S.Miura, N.Kamata, Y.Kawata and A.Inugami. Division of Radiology, Research Institute of Brain and Blood Vessels-AKITA, Akita.

The positron CT project in Research Institute of Brain and Blood Vessels-AKITA have been planned under the base of rCBF studies using the Xe-133 clearance, development of emission tomographs of the Headtome, family and SPECT studies using Headtome. The project will start in March of 1983 going with the opening of a new building for the Institute. The plan contains a baby cyclotron; BC-165, a new positron tomograph; Headtome III. The laboratories for the positron CT study is included in the unit of nuclear medicine division.

The main themes of the project in the 1st year are as follows: 1) the quantitative PET studies of rCBF and metabolism using the steady state model with $C^{15}O_2$, $^{15}O_2$ and ^{11}CO, and ^{18}FDG; 2) a pathophysiological study of rCBF and energy metabolism in stroke patients (cerebral infarct, hypertensive intracerebral hemorrhage and subarachnoid hemorrhage due to a ruptured aneurysm); and 3) developing new methods for a short time tomographic-rCBF study using single breath of $C^{15}O_2$ or a intravenous bolus injection of $H_2{}^{15}O$, and a inhalation of $^{13}N_2O$ or ^{18}F-fluoromethane. A correlative study between rCBF examination using PET and SPECT will also be carried out.

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COMPARATIVE STUDY ON TUMOR ACCUMULATION IN F-18-LABELED DEOXY ALDOHEXOSES. H.Fukuda, K.Yamada, S.Endo, Y.Abe, S.Yoshioka, H.Watanabe, T.Sato, T.Matsuzawa. Dept.of Radiol. & Nucl.Med, The Res.Inst.for TB & Cancer. T.Takahashi, M.Shinohara, K.Ishiwata, T.Ido. The Cyclotron & R.I.Center. M.Tada. Dept. of Pharmacorogy, The Res.Inst.for TB & Cancer. Tohoku University, Sendai.

F-18-labeled deoxy aldohexoses, F-18-deoxy glucose(F-18-FDG), F-18-deoxy mannose (F-18-FDM), F-18-deoxy galactose(F-18-FDGal) F-18-deoxy altrose (F-18-FDA) and L-F-18-deoxy glucose were tested for tumor diagnostic agent for positron emission tomography. Tissue distribution study in hepatoma bearing rats, showed that tumor uptake of F-18-FDG and F-18-FDM were very rapid and high (2-3%dose/g) with very low uptake of liver and kidney.
Whereas the tumor uptake of F-18-FDGal was low (0.7%dose/g) and tumor uptake of L-F-18-FDG,F-18-FDA were low and followed by rapid wash out.From these results,it was concluded that F-18-FDG and F-18-FDM were the best agent for cancer detection among these radiopharmaceuticals.

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POSITRON CT IN A PATIENT WITH SYSTEMIC LUPUS ERYTHEMATOSUS. M.Hiraiwa*,T.Abe*, Masaaki Iio**. *Teikyo University School of Medicine. **Nakano National Chest Hospital. Tokyo.

Serial positron CT (PCT) were performed in a 11-year-old japanese girl with systemic lupus erythematosus (SLE) with Headtome II (Shimadzu). The studies were consisted from C-11 glucose ingestion and C-11 CO2 inhalation. The first study in the active stage of SLE disclosed the right front-temporal low attenuation area (LAA) both in glcose and CO2. Paroxysmal focus in electroencephalography (EEG) was incident to the LAA. The second study in the inactive stage showed disappeared LAA, and the focus in EEG, too. The third study in the relapsing stage revealed reappeared LAA at the same area. On EEG, the similar paroxysmal focus was noted as the first. It is well known in the patient with SLE there were often identified symptoms in central nervous system (CNS), and these CNS symptoms were thought to be from cerebral vasculitis. The diagnosis of cerebral vasculitis is rather difficult with usual clinical techniques. In our case, these changes in PET studies were well incident to the clinical features and EEG findings. Then we thought the findings in PET might be represented the states of cerebral vasculitis.