

with sites of abnormal Q-waves in Ecg.

Exercise stress Ecg and stress scintigrams were performed in 20 patients. Myocardial perfusion defects developed by stress were detected in 5 of 6 definite positive exercise Ecg patients, 2 of 4 borderline exercise Ecg patients and 2 of 10

negative exercise Ecg patients. These 2 patients (exercise Ecg: negative, stress scintigram: positive) had typical angina.

These scintigraphic methods appear to be excellent for detection of coronary heart disease noninvasively.

Myocardial Scintigram with Rb-81 and Its Application to Regional Myocardial Perfusion Study

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Recently Rb-81 produced in a commercial cyclotron became available. Rubidium-81 decays with a half life of 4.6 hrs to Kr-81 m, emitting 446 KeV and 511 KeV gamma ray, and Kr-81 m decays with a half life of 13 sec to Kr-81, emitting 190 KeV gamma ray. These characteristics are very interesting for the application of the nuclide to the myocardial perfusion study because Rb-81 distributes in the myocardium, like potassium, after intravenous administration, and changes slowly, whereas its daughter Kr-81 m, being inert gas, mixes uniformly with tissue and removes from it at a rate dependent on the myocardial perfusion. Thus a quantification of myocardial perfusion rate can be made by comparing the separately measured activity of Rb-81 with that of Kr-81m.

In this study, 12 cases of myocardial infarction, 7 cases of angina pectoris and 7 normal subjects were injected intravenously 3-4 mCi of ⁸¹Rb chloride.

The radioactivities were measured by a scintillation camera with a pinhole collimator covered with a specially designed lead shield of 5 cm

thickness.

Myocardial images were obtained by both photon peak of 511 KeV and 190 KeV for Rb-81 and Kr-81m respectively in three views (AP, LAO, 1-LAT). And data obtained with the scintillation camera stored onto a magnetic tape of an on-line minicomputer system.

In a preliminary study, the ratio Rb/Kr in the whole myocardium were calculated. In most cases of myocardial infarction, the ratio were lower, but there were significant difference between cases of angina pectoris in asymptomatic state and normal subjects. After the measurements of the ratios at rest, some cases were sublingually 0.8 mg nitroglycerin and after 3 min the measurement of ratio were repeated. In normal subjects, slight decrease of ratio were shown, but in cases of myocardial infarction, marked decrease of the ratio at the infarcted region were observed.

It was suggested that the ratio of Rb/Kr was useful for the estimation of regional myocardial flow rate and also useful for the evaluation of the local responsibility to various agents.

Myocardial Scintigraphy with Rb-81 and Tl-201

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Several authors have reported on scintigrams with Rb-81 by a positron camera or gammacamera covered with thick lead-shielding on collimator

because of its high energy photons.

The purpose of this study is to obtain myocardial scintigrams with Rb-81 using a computeri-