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EVALUATION OF R WAVE AMPLITUDE CHANGES BY NUCLEAR CARDIOLOGY. H.Miyanaga, H.Adachi, H.Suginara, H.Katume, H.Ijichi, H.Tabata, K.Okamoto, Y.Torii, T.Watanabe, K.Matuoka
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R wave amplitude (RWA) changes during exercise were evaluated in 77 CAD pts by exercise 12 lead ECG data and compared with exercise Tl-201 myocardial perfusion image (MPI) and equilibrium radionuclide angiography (ERAG). In 34 pts with angina, exercise Tl-201 MPI showed increase of defect score obtained from circumferential profile method but only 7 of 15 pts showed increase of RWA in lead V5 during submaximal exercise. In 28 pts with myocardial infarction, 4 groups were classified by change of the defect score, as positive(1), positive(2), negative and paradoxical distribution. Positive(1),(2), negative groups showed relatively high percentage in increase of RWA. Other 15 CAD pts were evaluated using ERAG. 7 CAD pts showed RWA increase during exercise. In 6 of them, EF after exercise decreased, compared with at rest study and hypokinetic areas appeared in 5 of them. Thus it is seemed that RWA changes during exercise is not sensitive for myocardial ischemia but good indicator of cardiac function reserve.

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PROFILE CURVE ANALYSIS OF Tl-201 EXERCISE MYOCARDIAL IMAGES. S. Katsuragawa, T. Takahashi, T. Yanagisawa, K. Nakai*, K. Matsushita*, A. Kawamura* and M. Kato*
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In order to present quantitative informations to a diagnosis of ischemic heart disease, Tl-201 exercise myocardial images were evaluated using circumferential profile curves. A gamma camera (gamma VIE-H) with high-resolution collimator was used and interfaced to a mini-computer system (SIMIS-3) that allowed acquisition of data in 64x64 frame buffer. Images were obtained in anterior, 45° LAO and left lateral positions by recording 300k counts. Initial images were obtained at 20 min after exercise and Tl-201 injection, and delayed images 4 hr after injection. Each image was smoothed by a nine-point averaging algorithm and was processed using interpolative background subtraction. It was divided to 16 segments surrounded by 16 radii and the outer edge of the myocardial image. The distribution of Tl-201 activity was determined by calculating average activity per pixel in each segment and normalizing the data to the segment with the highest average activity. Finally, these data were displayed as a circumferential profile curve. By comparing these profile curves of initial images with delayed, regional perfusion defect after exercise could be detected quantitatively.

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"CIRCUMFERENTIAL PROFILES" ANALYSIS OF EXERCISE THALLIUM-201 MYOCARDIAL IMAGES FOR DETECTION OF CORONARY ARTERY DISEASE. K. Nakai, K. Matsushita, A. Kawamura, S. Yoshinaga, M. Kato, T. Takahashi*, S. Katsuragawa* and T. Yanagisawa* The 2nd Dept. of Int. Med. and Radiology*, Iwate Medical University School of Medicine, Morioka

To perform a more quantitative approach to exercise thallium-201 myocardial images, circumferential profile method was applied for detecting and evaluating the coronary artery disease (CAD). Eleven patients with coronary lesions who were found out angiographically were studied. Each of them was scored by Pajadas' method. Exercise scintigrams were taken by the standard techniques. Each image was smoothed using nine point averaging algorithm and subtracted using interpolated method. Data were displayed graphically as a "circumferential profile" of normalized activity against radial location. As an index of severity, Thallium defects were scored as $\Sigma(C \text{ rest-C stress})$. Total defect scores were compared with the parameters such as Σ ST ratio on the treadmill exercise. Nine of 11 CAD (82%) were diagnosed by circumferential profile method. Circumferential profiles were found to be more sensitive rather than visual interpretation alone for detecting CAD. Although a good correlation ($r=0.77$) was found between Σ ST ratio and Pajadas scores, no linear correlation was noted between total defect scores and Pajadas scores in the case of severe CAD.

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AUTODIAGNOSIS OF 201Tl MYOCARDIAL SCINTIGRAPHY—BY DISPLAY ON MYOCARDIAL MAP—T.Ohtomo, H.Kunishige, M.Sakanaka, S.Urano, I.Shimizu, K.Kitamura, K.Takagi, H.Adachi. 3rd. Dept. Int. Med., Matsushita Hosp., 2nd. Dept. Int. Med., Kyoto Pref. Univ. of Med., Osaka and Kyoto.

The purpose of the study is to introduce a new computerized method which we devised to automatically display the quantitative thallium uptake of the left ventricle on myocardial map. Five views imaging (Ant, LAO-30°, 60° L-LAT, RAO-30°) were obtained by the scintillation camera and analysis were made by the digital computer (DEC GAMMA-11). After interpolated BG subtraction, the left ventricle was detected by the isocount method. Each left ventricle was divided into 7 segments circumferentially except for the base. Uptake indices (UI) were computed as a percentage to maximum segmental counts per cell which were given at 100 in an image. The mean (m) and SD of normal segments were obtained by 10 normal controls. The corrected uptake indices (CUIs) were calculated as $CUI = (m - UI) / SD$. Segmental thallium uptake was finally classified into 3 grades by CUI as follows. WNL ($CUI < 1$), mild decrease ($1 \leq CUI < 3$), severe decrease ($3 \leq CUI$). The segments which were classified into 3 grades were displayed on computer oscillograph as the myocardial color map. The results were reproduced on 10 patients twice. These were shown to be 88% total agreement and no 2 grade disagreement was given. This computerized method was useful for clinical diagnosis and might be a close approach to complete autodiagnosis for the myocardial scintigraphy.