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MYOCARDIAL ISCHEMIA OF INFARCTED AREA AS A MECHANISM OF POST-MI ANGINA PECTORIS; A STUDY ON STRESS MYOCARDIAL SCINTIGRAPHY IN PATIENTS WITH SINGLE VESSEL DISEASE. M.Saito, T.Sumiyoshi, K.Kanno, M.Kawataki, J.Koda, K.Haze, K.Fukami, K.Hiramori, T.Uehara, K.Hatashida, T.Nishimura, T.Kozuka. National Cardiovascular Center, Osaka.

We aimed to investigate a role of myocardial ischemia (M-Is) of infarcted area (IA) represented by thallium redistribution (RD) in stress myocardial scintigraphy (SMS) as a possible mechanism of post-myocardial infarction (p-MI) angina pectoris (AP). Ninety-nine patients (pts) who underwent SMS, left ventriculography and coronary arteriography (CAG) which revealed single vessel disease or MI with normal CAG; 44 had anterior MI (A-MI), 21 had infero-posterior MI and 34 had AP without previous MI. Among those with A-MI, 16 had typical p-MI AP (group A), 13 had atypical chest pain while 15 had no history of p-MI AP. SMS was quantitatively analyzed by ROI counting method.

Pts in group A had less extent of myocardial defects ($74.3 \pm 12.2\%$ of normal region, $m \pm SD$) and higher RD ($+13.5 \pm 5.4\%$) compared to pts in group B ($50.4 \pm 11.9\%$, $+2.5 \pm 4.6\%$, respectively, $p < 0.01$). Group A pts had less severe LV asynergy, coronary stenosis of $\geq 75\%$ as well as higher rate of positive exercise test compared to group B, suggesting a possible development of M-Is in IA, clinically. These results suggest that thallium RD in infarcted area indicates myocardial ischemia of the area which still has viable myocardial mass.

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FUNCTIONAL IMAGING OF THALLIUM-201 WASHOUT RATIO AND CLINICAL UTILITY. N.Watanabe, K.Machida, J.Nishikawa, T.Ohtake, and M.Tio. Radiology. K.Kawakubo. 2nd Int.Med. Tokyo University. H.Toyama. Tokyo Geriatric Metropolitan Hospital. Tokyo.

In exercise Tl-201 myocardial scan, we developed a quantitative washout ratio (WR) image to detect ischemic segment. The washout value was measured with pixel by pixel calculation between counts of initial image and those of delayed 3 hr after injection image. We compared the color displayed functional WR image with the original image in detecting of ischemic segments which were confirmed by coronary angiography.

In study of 23 patients who were 21 of CAD (with MI 8, without MI 13) and two of normal, the sensitivity of WR image was 83% for diagnosis of ischemia and superior to the sensitivity of original image (79%). As concerns MI segments, 8/9 segments showed lower washout which represented partial redistribution on the delayed image and 6 of 7 non MI ischemic segments could be detected by the WR image but only 3 detected by the original image. These results indicate that the WR image could provide not only transient ischemia but additional ischemia of MI.

We conclude that the washout image will be useful in producing a visual indication of ischemic area.

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QUANTITATIVE ASSESSMENTS OF EXERCISE THALLIUM-201 MYOCARDIAL PERFUSION IMAGING USING CIRCUMFERENTIAL PROFILE METHOD. S.Sato, Y.Watanabe, I.Tonooka, T.Kanaya, K.Tsuiki, S.Yasui, K.Takahashi and A.Komatani. Yamagata University School of Medicine, Yamagata.

In normal subjects and patients with coronary artery disease (CAD), exercise thallium-201 myocardial perfusion imaging was performed. We used circumferential profile method to assess the severity of coronary artery stenosis quantitatively and compared with conventional ROI method. Each left ventricle image obtained by 4 planar views (RAO 50°, ANT, LAO 45°, left-lateral) was divided into 32 segments. Washout rate (WR) and redistribution index (RDI) were calculated in each segment. In each patient, SD index of each segment was calculated as follows: $SD \text{ index} = (X - m) / SD(X; RDI \text{ at the corresponding segment of the patient, } m; \text{ the mean of RDI in normal subjects, } SD; \text{ the standard deviation of RDI in normal subjects})$. In patients with one-vessel disease (75% or more narrowing in luminal diameter), SD indices were over 1.0, whereas those in patients with one-vessel disease (50-75% narrowing in luminal diameter) were from 0 to 1.0.

We compared the number of segments where the SD index was over 2.0 with the size of myocardial ischemia estimated from coronary angiogram.

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EVALUATION OF CIRCUMFERENTIAL ANALYSIS OF TL-201 STRESS MYOCARDIAL SCINTIGRAPHY. K.Inoue, T.Inoue, T.Ando, K.Yoshimura and M.Murayama. Kantoteishin Hospital, Tokyo.

Tl-201 stress myocardial scintigraphy were performed in 63 patients (44 with coronary artery disease (CAD) and 19 without CAD) to compare the diagnostic value of computer analysis with that of standard visual analysis. At 5 minutes and 4 hours after injection, imaging was performed in anterior, 45° left oblique and left lateral views. 60° left oblique view was also visually analysed. Mean normal profiles were calculated for 24 normal volunteers and lower normal limits were defined as mean-2S.D..

For detection of CAD, computer analysis has a sensitivity of 84% and a specificity of 84%, whereas visual analysis demonstrated a sensitivity of 86% and a specificity of 79%.

The data suggested that (1) computer analysis could not improve diagnostic accuracy for CAD, (2) computer analysis was useful in objectivity, reproducibility and independency of observer bias.