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## EVALUATION OF THE CARDIAC PERFORMANCE WITH PERMANENT PACEMAKER BY ECG GATED BLOOD POOL SCINTIGRAPHY.

M. Shimizu, T. Sekiya, Y. Yamazaki, J. Iwata, K. Yamada, H. Tomiya, M. Tonooka, T. Saito and Y. Inagaki. 3rd Dept. of Internal Med. Chiba University School of Medicine

VVI mode is the most common form of permanent pacing. The cardiac performance in 12 patients with VVI pacing (complete A-V block and sick sinus syndrome) were assessed by ECG gated blood pool scintigraphy (GBPS) using Tc-99m labelled red blood cell, then pacing rate were changed from 40 to 90 (every 10 bpm).

Cardiac output (CO) was measured by dye dilution method. Left ventricular ejection fraction (EF) and Phase image was calculated from GBPS images. Left ventricular stroke volume (SV), enddiastolic volume (EDV) and endosystolic volume (ESV) were also calculated, and moving images were analysed.

In the result, the higher heart rate produced decreased EF, SV, EDV, slightly increased CO, and slightly decreased ESV. The asynchronous left ventricular wall motion were also observed in higher pacing rates.

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## ANALYSES OF EFFECTS OF PACING MODES AND PACING RATES ON LV EJECTION AND FILLING PROPERTIES BY COMPUTERIZED CARDIAC NUCLEAR PROBE. Y. Seino, Y. Nagae, P. Laohathai, T. Tanaka, K. Tanaka, T. Katoh, T. Takano, H. Hayakawa, H. Okumura, S. Tanaka, A. Okuyama and K. Ebata. Dept. of Medicine (CCU-ICU), Thoracic Surgery and Radiology, Nippon Medical School, Tokyo

Differences in the effects of [1] pacing rates (PR) and [2] pacing modes (PM) on LV ejection and filling properties were analyzed by a high resolution (10msec) computerized cardiac nuclear probe (CNP) in eighteen pts with implanted programmable DDD, DVI or respiratory rate dependent VVI (BIOrate) pacemakers. (\*p<0.05 paired t-test) [1] On AAI (atrial) and AVs (sequential) PM, according to increase in PR (90-110/min), LVEF\*, ER\*, PFR\* and ACR\* (atrial contribution ratio/SV) increased significantly\* (VSPR70), and point of PFR shifted from the early diastole to atrial contraction (ACT) phase. While on VVI (ventricular) PM, LVEF and ER did not change despite of increase in PR, and ACR revealed nil. [2] LVEF and ER showed tendency to be higher on AAI and AVs compared to those on VVI at PR 90-110. Analyses by CNP clarified the increasing physiological importance of ACT at increasing PR. CNP would be extremely useful for noninvasive cardiodynamic investigation to establish the physiological LV filling and ejection.

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## EXERCISE Tl-201 MYOCARDIAL SCINTIGRAPHY AND HEMODYNAMICS IN PATIENTS WITH THE ISCHEMIC ST SEGMENT DEPRESSION ON EXERCISE ECG AND NORMAL CORONARY ANGIOGRAM.

Y. Furukawa, Y. Yamazaki, N. Nakamura, M. Shimizu, H. Tomiya, F. Hatogai, A. Sakaguchi, M. Tonooka, T. Saito and Y. Inagaki. The 3rd Dept. of Int. Med. Chiba University, Chiba.

Exercise testing was performed with Tl-201 myocardial scan in 19 patients with ST segment depression on exercise ECG and normal CAG (group II). And their hemodynamics on exercise was compared with those in normal subjects (group I, n=46) and in patients with effort angina pectoris (group III, n=21).

3 patients in group II showed transient defect on Tl-201 scintigram soon after exercise. Left ventricular ejection fraction increased gradually in group I and group II except 2 patients with transient defect on exercise Tl-201 scan. In 2 of 3 patients in group II with transient defect on exercise Tl-201 scan, LVEF was decreased during exercise. Pulmonary arterial diastolic pressure increased over 20 mmHg during exercise in group III, but it showed no change or slight increase during exercise in group II. And also in group II, patients with transient defect on exercise Tl-201 scan revealed the highest pulmonary arterial diastolic pressure during exercise.

In conclusion, group II was classified into two group according to their hemodynamics on exercise and their exercise Tl-201 scintigraphy.

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## LEFT VENTRICULAR SYSTOLIC AND DIASTOLIC FUNCTIONS DURING EXERCISE IN PATIENTS WITH EXERTIONAL CHEST PAIN AND "NORMAL" CORONARY ARTERIES.

K. Iida, R. Ajisaka, Y. Sugishita, I. Ito, \*T. Takeda and \*M. Akisada. Department of Internal Medicine and \*Department of Radiology, Institute of Clinical Medicine, University of Tsukuba, Tsukuba.

In order to evaluate left ventricular function during exercise in syndrome-X (X), 13 normal controls (NC), 11 patients with X and 9 patients with effort angina and one-vessel coronary artery disease (AP) were studied. Left ventricular function was examined by first-pass radionuclide angiography at rest and during supine ergometer exercise. There were no significant differences in heart rate at rest among the 3 groups. Left ventricular ejection fraction at rest was increased in the order of X>NC>AP, while left ventricular end-diastolic volume during exercise was increased in the order of AP>X>NC. Although there was no significant difference in left ventricular peak filling rate (PFR) at rest between NC and X, PFR during exercise was smaller in X than in NC.

In summary, both left ventricular systolic and diastolic functions were deteriorated in syndrome-X.