EVALUATION OF HEMODINAMICS IN PATIENTS WITH THYROIDAL DISEASE USING ECG-GATED RI ANGIOCARDIOGRAPHY

Kazuko Kashiwada*, Yasuhito Sasaki*, Kenji Hoshi*, Noriaki Sekita*, Mitsuyoshi Yamamoto*, Kazuhiko Someya*, Masamichi Fujii**, Tokuichi Sakaki***and Katsuyoshi Itagaki***

*The 3rd Department of Internal Medicine, **Department of Radiology, ***Division of clinical Nuclear Medicine, St. Marianna University School of Medicine

The hemodynamics of the patients with Graves' disease was studied by means of ECG-gated RI angiocardiography. RI angiocardiography was performed following a bolus injection of 10 mCi of ^{99m}Tc-albumin. Serial scientiphotos were taken by a Gamma-camera with 0.5 seconds interval. Simultaneously ECG-gated data were stored in minicomputer for the later analysis to obtain cardiac output (C.O.) and ejection fraction (E.F.). First pass method was used for measuring E.F.. Total circulating blood volume (TBV) was measured by counting radioactivity in the venous blood serially sampled at the equilibrium. Material consisted of patients with Graves' disease, patients with various heart disease and one nomal volunteer.

Circulating total blood volume ranged from 4678 to 6033 ml without significant differences among patients groups. Cardiac indices in patients with Graves' disease associated with hyperthyroidism was 11728 ± 4749 ml ($\bar{m}$ ± 1s.d.), which was higher than the values obtained in patients with heart disease with or without congestive heart failure (5164 ± 459 and 5984 ± 2677 ml), respectively. Patients with controled Graves' disease revealed lower cardiac index (6705 ± 800 ml) than hyperthyroid patients.

Ejection fraction of the patients with hyperthyroid Graves' disease ranged from 25% to 79% (52 ± 15%), which showed no significant differance from the E.F. obtained in euthyroid Graves' disease (61 ± 5%) and heart disease without CHF (54 ± 14%). Patients with CHF gave significantly low E.F. (35 ± 16%).

In two hyperthyroid Graves' disease, the examination was repeated after treatment, which revealed decreased heart rates, blood volume and cardiac indices at euthyroid state.

The method should prove usefull as a non-invasive means of assessing hemodynamics and left ventricular function especially in patients to whom cardiac catheterization is ordinarilly not indicated as in Graves' disease.

Analysis of hemodynamics at aortic valve area using EKG-gated RI-angiocardiography (Third report)

Shyn Iida, Mitsuru Amanuma*, Susumu Hasegawa*, Tohru Shindo*, Takeshi Morishita*, Motosada Kiri**, Minoru Hosoba***

*1st Department of Internal Medicine, School of Medicine, Toho University, Tokyo, **System Department, Shimazu Mfg.Ltd.*

This clinical research has been aimd to analyse the hemodynamics at the aortic and pulmonary valve area by means of EKG-gated RI-angiocardiography. Blood flow chart has been made to exhibit changes of RI activities in R-R interval at every 50 msec, as percentage. In addition to the former study which had reported blood flows at the aortic valve area between normal group and the aortic regurgitation(AR) group using EKG-gated RI-angiocardiography, those of pulmonary valve has been measured in this report. Also, frequengy analysis was made on the use of Fourier-transformation.

Method; 15mCi of 99mTc-HSA was intravenously flashed into the right cubital vein of the volunteers and AR patients with 30° of LAO. Apparatus to obtain data and results of analysis was Shimazu Scincipack 1200® connecting EKG-gated system.

Result; In AR group, blood flow charts could not be distinguished between the systolic and diastolic phase compared to the normal group. Same observations were showed in the experimental model of the aorta using blood pump and polyethylene tube. As a result of frequency analysis by Fourier-transformation, the intensity of the pulse flow was more regular in AR group than in the normal group. It is considered, therefore, that this method is aided to evaluate the grade of the sevirity in AR.