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EVALUATION OF REGULATION OF PERIPHERAL CIRCULATION BY Xe-133 CLEARANCE METHOD. Y. Mori, N.Katsuyama, K.Kawakami, T.Shimada*
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The purpose of this communication is to study the regulation of pripheral circulation in diabetic patients. We measured the peripheral circulation on 9 normal subjects and 25 diabetic patients by a Xe-133 clearance method and an admittance plethysmography. Effective flow in the skin and muscle was separately measured by Xe-133 clearance method. Total flow in the muscle and skin, which contain effective blood flow and non-effective shunt flow,measured by the admittance plethysmography. Shunt flow at rest was much in diabetic patients than in controls. In thermal stress, the change of shunt flow was less in diabetic patients. This result suggests that disturbance of regulation of the peripheral circulation may be caused by the diabetic microangiography.

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THE EVALUATION OF BLOOD VOLUME ——— WITH INCREASING AGE ——— M.Suzuki, M. Suwo
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We report the evaluation of blood volume (BV) with increasing age. The data in this study were used except for the patients with varied BV and those in serious state. These patients consisted of 177 males and 179 females, aged 15 to 79, and these were divided into the age-groups of every ten ages. BV was obtained by dilution technique using ^{131}I-human serum albumin (740-1110 kBq (20-30 μCi)) (mBV). BV was predicted from height (BL) and body weight (BW) (pBV); it was calculated from the following formula:

male; $pBV\ (BL,BW) = 37.3BL + 14.6BW - 2542$
$pBV\ (BL^3,BW) = 4.71 \times 10^{-4} BL^3 + 14.6BW + 1493$

female; $pBV\ (BL,BW) = 28.7BL + 21.5BW - 1897$
$pBV\ (BL^3,BW) = 4.32 \times 10^{-4} BL^3 + 21.6BW + 935$

The data were evaluated statistically by analysis of variance. The mBV showed significant difference among the age-groups ($p<0.01$-0.05) but the mBV/pBV(BL,BW) and the mBV/pBV(BL^3,BW) showed no difference and small deviation among the age-groups. It was indicated that BV should be evaluated on the basis of pBV.

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A study on cardiac functional imaging using Fourier analysis of gated blood-pool scan. H. Maeda, K. Takeda, T. Nakagawa, M. Taguchi, N. Yamaguch and S. Matsui Department of Radiology, Mie University School of Medicine and Toshiba Corporation. Tsu, Mie and Nasu, Tochigi

A new cardiac functional imaging, using temporal Furier analysis of 28 frame gated cardiac blood-pool studies, was developed. A time-activity curve of each pixel was approximated by its Fourier series. Nine parameters, obtained from thus fitted curve, being suitable for evaluating ventricular systolic and diastolic performances, were analyzed. These pixel-by-pixel based 9 parameters were displayed on a colour CRT.

The use of terms to the 3rd frequency was considered to be most suitable because of having the least influence due to statistical fluctuation and close agreement between the global original LV curve and the regional fitted curves in normal subjects. In patients with HOCM and other cardiac lesions, the detailed information on the regional ventricular systolic and diastlic performances, which was difficult to obtain from the functional images of phase and amplitude at the fundamental frequency, was detected by the above-mentioned method.

We conclude that our new method is useful to evaluate the regional cardiac performances.

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ATTENUATION CORRECTION METHOD ON THE DETECTION OF LV ACTIVITY WITH FIRST PASS METHOD IN RAO PROJECTION. S. Yonamine, S. Chiba K. Kumagai, H. Murata, H. Toyama, H. Yamada K. Chiba, H. Tabuchi, M. Noguchi, H. Ootake
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The detected counts of the radioactivity in left ventricle in RAO projection with first pass method are attenuated by the right ventriclar blood pool. Quantity of attenuation is in propotion to the thickness of the right ventricle including blood pool. The thickness of the right ventricle (Ta) can be supporsed from the right ventriclar counts. Measured counts of the right ventricle(Da) is calculated as follows. $Da = \rho a \cdot Ta$, where ρa is counts/cm and takes various values by the activity of the radionuclide and by the efficiency of gamma camera. The left ventriclar counts after attenuation correction(S_0) is expressed as $S_0 = E \cdot Ds(\rho a/\rho a - Da \cdot \mu a)$. Ejection fractions are calculated using several value of ρa and the calculated ejection fractions have a peak value at the limited value of ρa. Corrected ejection fractions were 10 percents higher than those without correction in 10 normal cases.Corrected ejection fractions by the present method had almost same value to those by equilibulium method. The present attenuation correction method was useful for clinical studies.