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Acute reaction of blood flow in the lower leg to the vasodilator, An evaluation by means of a venous occlusive RN plethysmography. Y. Mashima, M. Ida, S. Matsumoto, F. Oosugi, M. Nagase, E. Moriya, K. Kawakami. The department of radiology of Jikei University School of Medicine, Tokyo. H. Itou, S. Tanaka, T. Shimada. The department of medicine of Jikei University.

We have developed a venous occlusive radio-nuclide plethysmography (RN plethysmo.) and reported that this method is useful for measurement of blood flow volume in the lower legs. On this communication, we studied an acute reaction of circulation in lower legs to the vasodilator (pro-stacycline-PGI₂) by the RN plethysmo.. The subjects were 9 patients (7 with ASO and 2 without ASO), the occlusive RN plethysmo. was performed on the supine position before and during intravenous infusion of PGI₂. Consequently, blood flow volume was significantly increased during infusion of PGI₂ in the non-ASO group. However, in the ASO group change of blood flow volume by PGI₂ was not significantly seen. Mean arterial blood pressure was decreased about 20 mmHg during the infusion in all cases, and it is considered that PGI₂ decreased the systemic vascular resistance. The patients with obstruction or stenosis in proximal site such as ASO did not show acute effect of PGI₂, that is, the peripheral blood flow was not increased. The result suggests that the RN plethysmo. is a useful method to evaluate the acute effect for the vasodilator.

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LEG MUSCLE PERFUSION STUDY USING Tl-201 SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY (SPECT). M. Oshima, T. Yano, N. Nishikimi, S. Sionoya, H. Akanabe and S. Sakuma. University of Nagoya Medical School, Nagoya.

The purpose of this study is to evaluate leg muscle perfusion with Tl-201 SPECT. Twenty-three patients with peripheral arterial disease underwent this examination. A cuff was applied above the knee bilaterally and was inflated to 50 mmHg above the brachial systolic pressure. During deflation of the cuff, 3 mCi of Tl-201 was injected intravenously. The lower leg SPECT imaging and whole body imaging were performed by rotating dual type digital gamma cameras (Toshiba GCA-70A) with on-line minicomputer. Transverse images of leg muscle were compared with clinical symptoms and arteriographic findings. For quantitative analysis, each slice counts of lower leg were normalized by whole body counts.

Results were as follows; 1) Tl-201 SPECT perfusion image of lower leg was obtained satisfactory, 2) SPECT image can be divided into anterior tibial muscle and posterior tibial muscle component, 3) Six out of 8 legs which showed obstructive lesions with adequate collateralization demonstrated normal SPECT image, and 4) Ten out of 13 legs demonstrated abnormal defects correspond with the distribution of arteriograms. In conclusion, SPECT perfusion distribution with quantitative analysis was correlated with arteriographic findings and clinical symptoms.

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EVALUATION OF THERAPEUTIC EFFECTIVENESS IN CASES OF ISCHEMIC ULCER IN CHRONIC OCCLUSIVE ARTERIAL DISEASE USING THALLIUM-201. S. Motoyasu, M. Tomonari, K. Hurukawa, H. Nurayama. Tokyo Medical College, Tokyo.

Ischemic ulcers in cases of chronic occlusive arterial disease are difficult to cure, but by measuring Thallium-201 activity in ischemic ulcer, the curability of ulcer can be evaluated. In this study, the activity before and after treatment was measured. The results were calculated according to the method developed by Siegel et al. In addition, the author developed a new method that involved referring to the mean ulcer index of toes when studying the sole scintigram.

Consequently, both indices using Thallium-201 showed the degree of toe hyperemia accompanying ulcers on the sole and toe pads. The indices also indicated the effect of the ulcer on the relative distribution of blood flow. Both indices showed a high correlation between index value and curability of the ulcer ($r=0.862, p<0.001$). In the present study, cases with better curability showed values higher than 1.4 for the ulcer index and 1.2 for the mean ulcer index of toes. In addition, when both indices are compared before and after treatment, they are useful not only for evaluating curability but also for studying the effects of treatment and the effects of the ulcers on the distribution of blood flow.

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A NEW TECHNIQUE FOR MEASUREMENT OF THE PRESSURE IN ARTERIOLE OF LOWER EXTREMITY USING Xe-133 CLEARANCE METHOD. H. Itou, Y. Kurisu, Y. Mori, K. Kawakami and T. Shimada. Jikei University School of Medicine, Tokyo.

We developed a new technique to measure blood pressure in capillary level by means of Xe-133 clearance method and applied this method to 14 normal volunteers (37.9±14.9 year) and 18 diabetics (52.3±12.9 year). Three cases of the diabetics had gangrenes and treated with an intra-arterial continuous injection of PGE₁. After lying the subject in supine position for 10 minutes 0.01 ml of Xe-133 saline (100 μCi) was injected intracutaneously and the time activity curve was recorded by scintillation probe, then the blood flow was stopped by inflation of balloon on the injected area. This was confirmed by the pattern of the Xe-133 clearance curve. The balloon was deflated gradually in monitoring its pressure, and the pressure at the point of opening of blood vessel recorded as the pressure at the capillary level. Blood flow pressure is 27.0±5.8 cmH₂O in the normal group, 14.2±7.4 cmH₂O in the diabetics. Blood flow volume is 7.7±1.5 ml/min/100g in normal, 5.1±1.8 ml/min/100g in diabetics. There was statistical significance between the normal and the diabetics. Blood flow resistance has no significance. So these results lead to that reduction of blood flow in the capillary bed of the diabetics may be due to stealing of blood flow through arteriovenous anastomoses as shunt flow. This mechanism makes diabetics develop to gangrene.