

Vascular surgeons are also working to prevent atherosclerosis



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As a vascular surgeon who treats patients with pathologically advanced atherosclerosis such as critical leg ischemia and ruptured aortic aneurysms, I cannot help but feel keenly the need for early detection and early treatment of atherosclerosis.

It has been known that people with risk factors such as smoking, diabetes, hypertension, and dyslipidemia are more likely to develop the atherothrombosis 20 to 30 years later. We established the "Atherosclerosis Vascular Screening" in 2002 since I had had a simple question, "Why can't we detect atherothrombosis at an early stage before it becomes symptomatic?"

Vascular Lab and atherosclerosis vascular checkup, and development to vascular health screening

In recent years, the number of non-invasive vascular testing methods has increased and new testing techniques need to be learned, making it difficult for vascular surgeons to obtain quality vascular information efficiently.

Therefore, we pioneered the vascular laboratory at our center 9 years ago. We initially trained our staff privately, but now utilize the Clinical Vascular Technician (CVT) framework to train and maintain the quality of our staff.

We started the atherosclerosis vascular screening program in order to increase the utilization rate of the vascular lab equipment and to make effective use of human resources, and we have received many comments from examinees that they had been hoping for vascular screening. In June 2009, we began offering a "Brain and Vascular Checkup" that includes brain MRI scan, lower extremity venous ultrasound, and vascular endothelial function test (FMD) with UNEXEF. The FMD test is a test to detect the early stage of atherosclerosis, so we now have all the right players.

Positioning of the FMD test in the vascular checkup

I had heard that people who underwent physical and brain checkups were likely health-conscious, but after a while since we started the vascular screening for atherosclerosis, in fact, I noticed that many healthy people were willing to spend a certain amount of time and money to check their own health also for vascular health. Even in carotid artery echocardiography, which is said to be a "window of detecting atherosclerosis," the number of people with abnormal intima-media thickening (IMT) is still small.

Therefore, it has become necessary to shift our attention from morphological abnormalities to functional abnormalities. We thought that functional abnormalities would appear much earlier than morphological abnormalities in atherosclerosis, which is why we decided to use the FMD test to evaluate these abnormalities.

It was at that time that we came across UNEXEF, which is simple and highly reproducible, and it was a "god-send" for us. Before full-scale introduction, we trained our staff for the FMD test, which was much faster and easier than we had expected.

【 Brain and Vascular Checkup 】

[Test Items]

Brain MRI, carotid echocardiography, abdominal aortic echocardiography, thoracoabdominal radiography, extremity blood pressure pulse wave measurement, thermography, venous echocardiography, vascular endothelial function test (UNEXEF)

Vascular Screening Center



Effective Utilization Example of UNEXEF

PAD patients and FMD

Comparing 51 PAD patients with healthy subjects, FMD values were significantly lower in patients with PAD ($4.2 \pm 7.2\%$) than healthy subjects ($9.9 \pm 3.4\%$). (Figure 1)

However, among the patients, those who had walked or quit smoking tended to have better values, while those with critical limb ischemia tended to have worse values.

It was thought that those with relatively good FMD and NMD values had preserved endothelial and smooth muscle function, so the effects of walking and other activities were more likely to be apparent.

In addition, since smoking cessation is also effective in combination with walking, it can be effectively used as guidance for patients.

Case presentation in which FMD was useful

Age 53, Male

【Thoracoabdominal X-P】

No aortic calcification

【ABI】

right 1.19, left 1.12, normal

【PWV】

right 1401cm/s, left 1431cm/s, normal

【Carotid IMT】

right 0.80, left 0.58mm, normal

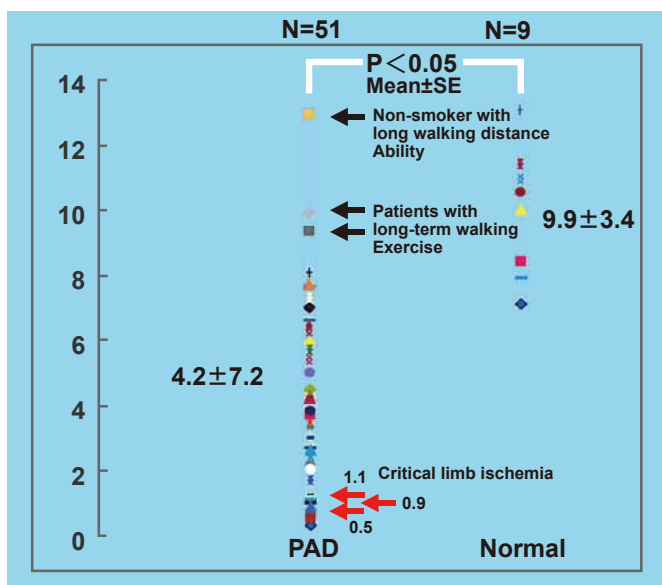


Fig.1 %FMD in healthy subjects and PAD patients

According to the self-report upon vascular checkup, the patient had no smoking history, no hypertension, no diabetes mellitus, and no dyslipidemia.

However, the FMD test showed a low value of 3.8%, which made us suspicious about the self-report, so we performed a blood test with the consent of the examinee. The results showed that total cholesterol was 208 mg/dl, but LDL 134 mg/dl and HDL 46.1 mg/dl, which were abnormal, with LDL/HDL = 2.9. HbA1c was also slightly elevated at 6.0%.

Although still mildly abnormal, this case suggests that the polymerization of these risk factors may affect vascular endothelial function.

Since the FMD test detected a state of transition to diabetes and dyslipidemia, we were able to promptly instruct the patient on diet and exercise therapy.

In the future, the FMD test, a functional test, will be indispensable for screening for early atherosclerosis.