

The Assessments of Vascular Function: Their Applicability in Vascular Health Screening

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Ultrasound examination is a promising tool to evaluate morphological changes in atherosclerotic vascular damage. On the other hand, the assessments of vascular function such as flow-mediated vasodilatation of brachial artery in reactive hyperemia (FMD), pulse wave velocity (PWV) and pulse wave analysis (augmentation index: AI) are thought to be a marker of early stage of atherosclerosis and/or a marker to predict future cardiovascular events. In this session, I will summarize the recent data;

1. FMD

Recently, semi-automated instrument to assess FMD is available in Japan, and this instrument dramatically improved the applicability of FMD in clinical practice. In 966 Japanese healthy subjects, we confirmed that age, gender and smoking were major determinant of FMD and proposed the cut-off value of normal FMD is 5%.

2. Radial augmentation index (rAI)

In 6112 Japanese healthy subjects, rAI was higher in women than in men. The second peak of radial systolic pressure waveform (SBP2) had a closed correlation with Framingham risk score (FRS) in both genders. Receiver-operator characteristics curve analysis demonstrated that SBP2 had more useful marker to identify the subjects with over 10% cardiovascular risk assessed by FRS than that by brachial systolic blood pressure.

3. Brachial-ankle PWV (baPWV)

Our prospective study demonstrated that baPWV is a useful tool to indicate vascular damage in subjects with metabolic syndrome as comparing with rAI. The increased baPWV is also observed in subjects with sleep disorder, inflammation and/or renal dysfunction. In subjects with prehypertension, baPWV ≥ 14 m/sec is a risk for developing to hypertension.