

Successful prediction of cardiovascular risk by new non-invasive vascular indexes using suprasystolic cuff oscillometric waveform analysis

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Background

Recently, new non-invasive vascular indexes named arterial velocity pulse index (AVI) and arterial pressure volume index (API), which is evaluated by a multifunctional blood pressure monitoring device, were developed using cuff oscillometric technologies and suprasystolic cuff oscillometric wave measurement. However, although a few studies including a computational model have been performed, data on subjects with cardiovascular diseases in actual outpatient clinics remain scant.

Methods

We examined a total 252 consecutive outpatients and analyzed two vascular indexes with various clinical parameters to explore potential utilities of these two indexes in actual clinical settings.

Results

Although we found that two indexes were correlated with each other, the clinical implications of these indexes seemed to differ. Our analyses showed that AVI significantly correlated with augmentation index, but not with flow-mediated dilatation, and multivariate analyses suggested that enhanced AVI represents increased workload on the heart with elevated central blood pressure. In contrast, although the results of analyses performed to identify clinical parameters independently related to API were obscure and non-specific, after adjustment for multiple clinical variables, API was found to be significantly and independently associated with both Framingham Cardiovascular Risk Score and the Suita Score, suggesting that API is a useful predictor of future cardiovascular events.

Conclusions

These two new vascular indexes might be useful in actual clinical settings to evaluate cardiovascular risks with various clinical backgrounds.