Cardiovascular Disease (CVD) in Patients with Chronic Kidney Disease (CKD)

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Chronic kidney disease (CKD) is an increasing worldwide public health problem associated with increased morbidity and mortality. Cardiovascular disease is the leading cause of mortality in CKD patients. Identification of patients at high risk for cardiovascular disease and requiring aggressive preventive and interventional strategies is an initial and essential step in managing patients with CKD. This excess cardiovascular risk in part attributed to an increase of traditional risk factors including old age, hypertension, diabetes and smoking, but may also relate to nontraditional risk factors, such as atherosclerosis, arterial stiffness and structural and functional abnormalities of heart.

A clinical device, ABI-form, has been developed to automatically and simultaneously measure blood pressures in both arms and ankles and record pulse waves of the brachial and posterior tibial arteries using an automated oscillometric method. Using this device, we can easily obtain the values of brachial-ankle pulse wave velocity (baPWV) and ankle-brachial index (ABI), good markers for arterial stiffness and peripheral artery disease, respectively. In addition, this device can also automatically calculate the brachial pre-ejection period (bPEP) and brachial ejection time (bET) by analyzing the signals of electrocardiogram, phonocardiogram, and brachial pressure volume waveform, which highly correlates with left ventricular ejection fraction.

Atherosclerosis and left ventricular systolic function markers, obtained from the ABI-form device can predict overall and cardiovascular mortality in patients with CKD. Screening CKD patients by means of ABI and echocardiography may help to identify a high-risk group for increased mortality.