

Relationship of Carotid Intima-Media Thickness, Pulse Wave Velocity, and Ankle Brachial Index to the Severity of Coronary Artery Atherosclerosis

YOSHIHIRO MATSUSHIMA, M.D., HIROAKI KAWANO, M.D., YUJI KOIDE, M.D., TAKESHI BABA, M.D., GENJI TODA, M.D., SHINJI SETO, M.D., KATSUSUKE YANO, M.D.

Department of Cardiovascular Medicine, Course of Medical and Dental Sciences, Graduate School of Biomedical Sciences, Nagasaki University, Nagasaki, Japan

Summary

Background: Carotid intima-media thickness (IMT), pulse wave velocity (PWV), and the ankle brachial index (ABI) are widely used noninvasive modalities for evaluating atherosclerosis.

Hypothesis: The aim of this study was to determine the relationship of carotid IMT, PWV, and ABI with the severity of coronary artery disease (CAD), expressed as the Gensini score, and the presence of coronary risk factors.

Methods: We examined 205 consecutive patients (mean age 65 ± 12 years) who were clinically suspected of having CAD and were scheduled to undergo coronary angiography. Carotid intima-media thickness, brachial-ankle PWV (baPWV), and ABI were measured in all subjects before they underwent coronary angiography.

Results: Of the 205 patients, 124 patients were diagnosed as having CAD based on the presence of $> 50\%$ stenosis in a major coronary artery; the remaining 81 patients did not have CAD. A relatively good correlation was obtained between carotid IMT and the Gensini score ($R = 0.411$, $p < 0.0001$), whereas baPWV correlated only weakly with the Gensini score ($R = 0.203$, $p = 0.0035$), and ABI did not correlate with it. A multiple regression analysis revealed that the Gensini score correlated significantly and independently with age, male gender, and carotid IMT.

Conclusions: Of the three noninvasive methods, carotid IMT may be more useful for determining coronary artery atherosclerosis than baPWV or ABI.

Key words: atherosclerosis, intima-media thickness, pulse wave velocity, ankle-brachial index, coronary artery disease

Address for reprints:

Yoshihiro Matsushima, M.D.
Department of Cardiovascular Medicine
Course of Medical and Dental Sciences
Graduate School of Biomedical Sciences
Nagasaki University
1-7-1 Sakamoto, Nagasaki city
Nagasaki 852-8501, Japan
e-mail: Yoshi226@aol.com

Received: March 17, 2004

Accepted with revision: August 2, 2004