Journal of Cardiovascular Magnetic Resonance

Poster presentation

Open Access

Associations between serum lipoprotein(a) levels and the severities of aortic and coronary atherosclerosis

Yukihiko Momiyama*[1], Reiko Ohmori[2], Zahi A Fayad[3], Teruyoshi Kihara[4], Ryuichi Kato[2], Hiroaki Taniguchi[2], Masayoshi Nagata[4], Haruo Nakamura[2] and Fumitaka Ohsuzu[2]

Address: [1]National Hospital Organization Tokyo Medical Center, Tokyo, Japan, [2]National Defense Medical College, Saitama, Japan, [3]Mount Sinai School of Medicine, New York, NY, USA and [4]Iruma Heart Hospital, Saitama, Japan

* Corresponding author

from 13th Annual SCMR Scientific Sessions
Phoenix, AZ, USA. 21-24 January 2010

Published: 21 January 2010

Journal of Cardiovascular Magnetic Resonance 2010, **12**(Suppl 1):P131 doi:10.1186/1532-429X-12-S1-P131

This abstract is available from: http://jcmr-online.com/content/12/S1/P131

Introduction

Recently, lipoprotein(a) (Lp(a)) became recognized as a coronary risk factor. A few studies showed association between Lp(a) and thoracic aortic plaques using trans-esophageal echocardiography, but there was no report showing associations between Lp(a) and both thoracic and abdominal aortic plaques.

Purpose

Using MRI, we investigated associations between serum Lp(a) levels and aortic atherosclerosis as well as coronary atherosclerosis.

Methods

Aortic MRI was performed on Signa 1.5 T in 143 patients undergoing coronary angiography. Transverse PDW and T2W images of thoracic descending and abdominal aortas were obtained using double-inversion-recovery FSE sequence: TR = 2 RR intervals, TE = 10 ms (PDW) and 60 ms (T2W), 20-cm FOV, 4-mm slice thickness, and 8-mm inter-slice gap. For each patient, 9 slices of thoracic aorta and 9 slices of abdominal aorta were obtained at 12-mm intervals. Plaque extent in each slice was scored 0-4 points by the percentage of luminal surface involved by plaque. The severity of aortic atherosclerosis was represented as sum of scores (plaque score). On coronary angiograms, the severity of coronary atherosclerosis was represented as the numbers of > 50% stenotic vessels and > 25% stenotic segments.

Results

Of 143 patients, 104(73%) had CAD(> 50% stenosis) on angiograms. Thoracic and abdominal aortic plaques were found in 89(62%) and 131(92%) patients. Lp(a) levels were higher in patients with CAD than without CAD (median 21.8 vs. 15.7 mg/dL, $P < 0.05$). Stepwise increase in Lp(a) levels was found depending on the number of > 50% stenotic vessels: 15.7 (0-VD), 21.2 (1-VD), 21.4 (2-VD), and 22.9 mg/dL(3-VD) ($P < 0.05$). Lp(a) correlated with the number of > 25% stenotic segments($r = 0.18$). In multivariate analysis, Lp(a) was an independent factor for CAD. Regarding aortic atherosclerosis, 143 patients were divided into quartiles by plaque score. Stepwise increase in Lp(a) was found depending on quartiles of aortic plaque score: 16.3 (Q1), 18.7 (Q2), 21.4 (Q3), and 23.7 mg/dL(Q4) ($P < 0.005$). Lp(a) correlated with plaque score($r = 0.18$). In multivariate analysis, Lp(a) was an independent factor for aortic atherosclerosis. In sub-analysis of thoracic and abdominal aortic atherosclerosis, Lp(a) tended to increase on quartiles of thoracic plaque score: 17.1, 19.0, 23.5, and 21.2 mg/dL (P = NS), whereas stepwise increase in Lp(a) was found depending on quartiles of abdominal plaque score: 17.1, 19.2, 19.1, and 24.0 mg/dL ($P < 0.05$). In multivariate analysis, Lp(a) was a

factor for abdominal aortic atherosclerosis, but not for thoracic aortic atherosclerosis.

Conclusion

Serum Lp(a) levels were associated with aortic atherosclerosis, especially in abdominal aorta, as well as coronary atherosclerosis. MRI was useful for non-invasively evaluating atherosclerosis in thoracic and abdominal aortas.