Lipoprotein-Phospholipase A2 is associated with abnormal digital reactive hyperemia and impaired coronary flow reserve in patients with stable coronary artery disease

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Authors: Ignatios Ikonomidis, John Lekakis, Paraskevi Trivilou, Vlassis Tritakis, Stavros Tzortzis, Charalambos Koukoulis, Kostas Kontsas, Maria Anastasiou-Nana, University of Athens, Attikon hospital, Athens, Greece

Background: Lipoprotein phospholipase A2 (Lp-PLA2) is an emerging inflammatory marker with prognostic value. Reactive hyperemia peripheral arterial tonometry (RH-PAT) is a method to assess peripheral microvascular endothelial function and is linked to coronary microvascular endothelial dysfunction. We investigated the association of Lp-PLA2 with RH-PAT, coronary flow reserve (CFR), and carotid intima media thickness in CAD patients.

Methods: Using RH-PAT, digital pulse volume changes during reactive hyperemia were assessed in 70 patients with angiographically documented CAD. RH-PAT index, a measure of reactive hyperemia, was calculated as the ratio of the digital pulse volume during reactive hyperemia divided by that at baseline using the Endo-PAT apparatus. Coronary flow reserve (CFR) of the LAD after adenosine infusion was assessed using Doppler echocardiography. The mean intima-media thickness (IMT) in common carotids and carotid bulbs using ultrasound imaging was also measured. According to the values of the 25th percentile of CFR, RH-PAT and IMT, patients were categorised into those with CFR <2.1, RH-PAT index <1.4, or IMT>0.9 mm.

Results: Increasing levels of Lp-PLA2 were related with smoking, decreasing CFR, decreasing RH-PAT index and increasing IMT values (r=0.41, r=-0.39, r=-0.45 and r=0.38 respectively, p<0.05). Lp-PLA2 was higher in patients with CFR<2.1 than in those with CFR>2.1 (169±48 vs. 117±24 pg/ml, p=0.003), in patients with RH-PAT index <1.4 than in those with RH-PAT >1.4 (144±40 vs. 115±29 pg/ml, p=0.02) and in patients with IMT>0.9mm than in those with IMT>0.9mm (138±36 vs. 97±40 pg/ml, p=0.015).

Conclusions: Increasing levels of Lp-PLA2 are related to endothelial dysfunction, impaired CFR and evidence of carotid atherosclerosis suggesting a potential role for Lp-PLA2 to identify stable CAD patients with adverse prognosis.