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Vascular ultrasound screening of subclinical arteriosclerosis alongside with assessment of vulnerability in plaque evolution towards thromboembolic complications through the strain-elastography

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Atherosclerosis and its complications, are the leading cause of morbidity and mortality from heart attacks and strokes in Romania.

It is a chronic inflammatory disease of the arterial wall induced from endothelial injury followed finally by the complications of plaque and its obstruction.

Methods: We did a randomized clinical trial, controlled, over two years, on 500Caucasian patients, aged 40-80years, sex ratio1:1. Inclusion criteria were asymptomatic patients with high-risk lipid profile (LDL>160mg%) with or without statins and antiplatelet therapy in the past two years. Exclusion criteria was target organ damage.

We formed two groups: first under treatment with statins and antiplatelet agents and control group with untreated patients. All patients were examined with Doppler ultrasound and SE in three regions: carotid, abdominal aorta and femoral arteries. We monitored following: IMT, velocity, RI, PI, stenosis. We have established criteria of elastography, for classification of atherosclerotic plaque in 'stable-uniform elasticity' or „unstable-mosaic stiffness'. We performed descriptive and risk analysis. We have designed an ultrasound score to diagnose the vulnerable plaque.

Results: Increase of carotid IMT between 0.9-1.5 mm had meant: mild and moderate atherosclerosis in 42% of patients in the first and 33% in the control group. IMT over 1.5 mm had meant severe atherosclerosis in 58% of the first and 67% in the second group. These changes were consistent with 89% of cases in aorta territory and 78% at the femoral artery, $p < 0.01$. Cut off value:of the aorta and femoral $IMT > 0.5$ cm. Sensitivity:96.2%, specificity:88%, 95%CI:79.97%to93.64%, prevalence:83%. We analyzed the concept of early vascular aging with incidence:3.46%. The relative risk was:0.86 with 95%CI:0.75to1, Odds Ratio:0.68, $p < 0.05$.

Conclusion: Ultrasound measurement of IMT in three regions, when assessing subclinical atherosclerosis and classification through elastography of the atheroma plaque in the vulnerable, was important for primary prevention of cardiovascular events and to early initiation of therapy.