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Coronary flow velocity assessment in routine echocardiography predicts adverse outcomes in three-year period in different subgroups

Zagatina A.[1]; Zhuravskaya N.[2]; Guseva O.[3]; Kalinina E.[4]; Drozdova Y.[1]; Yurkin D.[4]; Shmatov D.[1]

[1]Saint Petersburg State University, Saint Petersburg, Russian Federation
[2]Saint Petersburg State University Clinic of advanced medical technologies, Cardiology, Saint Petersburg, Russian Federation
[3]Saint Petersburg Government Hospital #40, Saint Petersburg, Russian Federation
[4]North-Western State Medical University named after I.I. Mechnikov, Saint Petersburg, Russian Federation

Background. The previous diagnostic study had demonstrated high correlation of maximal coronary flow velocity with significant stenoses by invasive methods. There is a lack of information about the prognostic value of local high velocity in coronary arteries during echocardiography. The present study was aimed at investigating the three-year prognostic value of coronary flow assessment in all patients were referred for routine echocardiography examination in different subgroup.

Methods. The prospective study comprises 747 consecutive patients (380 males; age 58 + 13 years) referred to echocardiography. Routine echocardiography was added with coronary flow velocity assessment in the left main (LM), left anterior descending (LAD) or circumflex (Cx) coronary arteries measured by Doppler method. Death, nonfatal myocardial infarction (MI), acute coronary syndrome (ACS) and/or revascularization were defined as major adverse cardiac events (MACE).

Results. During a median follow-up of 36 months, 192 patients experienced 224 MACE. Twenty-six deaths, 16 non-fatal MI, 2 ACS, 180 revascularizations were observed. The value of 67 cm/s maximal coronary flow velocity in the left main/proximal LAD/proximal LCX arteries was the best predictor for death (area under curve 0.79, 95% CI 0.76-0.82), $p < 0.0001$, and 66 cm/s was the best predictor for death/MI (area under curve 0.81, 95% CI 0.78-0.84), $p < 0.0001$. A value of 64 cm/s in left main/proximal LAD/proximal LCX arteries was a significant predictor of all MACE (area under curve 0.83, 95% CI 0.79-0.85), sensitivity 73%, specificity 84%, $p < 0.0001$.

Death/MI/ACS syndrome were observed in the main group in 17% vs. 1% patients with coronary velocity more than 65 cm/s the left main/proximal LAD/proximal LCX arteries vs. patients with less than 65 cm/s, respectively, $p < 0.0001$.

Arterial hypertension subgroup. Deaths occurred in 9% vs. 1%, $p < 0.003$. Death/MI/ACS were observed in 11% vs. 1%, $p < 0.004$.

Subgroup with known CAD. Deaths occurred in 11% vs. 3%, $p < 0.04$. Death/MI/ACS were observed in 20% vs. 3%, $p < 0.0006$.

Subgroup of patient with unknown origin chest pain. Deaths occurred in 3% vs. 1%, p – non significant. Death/MI/ACS observed in 9% vs. 0, $p < 0.04$.

Subgroup with valve disease. Deaths occurred in 17% vs. 0%, $p < 0.02$. Death/MI/ACS were observed in 17% vs. 0%, $p < 0.02$.

Conclusion. The coronary velocity parameters give long-term prognostic information that can be used to identify persons with a high risk of MACE in non-selected patients, also as in patients with arterial hypertension, known or suspected CAD, valve disease.

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