Modifiable risk factors for heart disease and coronary flow reserve assessed by transthoracic echocardiography

Alden Begić[1]*, Edin Begić[2], Nirvana Šabanović-Bajramović[1], Amer Iglica[1], Nermir Granov[1], Mirza Dilić[1], Zijo Begić[1]

[1]Clinical Center University of Sarajevo, Sarajevo, Bosnia and Herzegovina

[2]General Hospital "Prim.dr. Abdulah Nakaš", Sarajevo, Bosnia and Herzegovina

KEYWORDS: echocardiography, atherosclerosis, prevention.

CITATION: Cardiol Croat. 2022;17(9-10):166. | https://doi.org/10.15836/ccar2022.166

***ADDRESS FOR CORRESPONDENCE**: Alden Begić, Klinički centar Univerziteta Sarajevo, Bolnička 25, 71000 Sarajevo, Bosnia and Herzegovina. / Phone: +387-61-203-300 / E-mail: aldenbegic@yahoo.com

ORCID: Alden Begić, https://orcid.org/0000-0002-5374-0892 • Edin Begić, https://orcid.org/0000-0001-6842-262X
Nirvana Šabanović-Bajramović, https://orcid.org/0000-0003-3749-6073 • Amer Iglica, https://orcid.org/0000-0002-4677-8489
Nermir Granov, https://orcid.org/0000-0002-6228-6230 • Mirza Dilić, https://orcid.org/0000-0002-7309-1455
Zijo Begić, https://orcid.org/0000-0002-1863-5755

Goal: To indicate the influence of risk factors for the development of coronary artery disease (CAD) on coronary flow reserve (CFR) values assessed by transthoracic echocardiography (TTE) in patients without verified CAD.

Methods: The paper presents an analysis of the available literature from reference databases covering the mentioned topic.

Results: TTE-CFR presents a ratio of hyperaemic coronary blood flow during maximum vasodilation in relation to resting coronary blood flow. The most commonly used vasodilators are dipyridamole and adenosine (adenosine 140 mcg/kg/min (1-2 min), dipyridamole 0.84 mg/kg/6 min). Age and female gender have a lesser effect on the values of hyperemic CFR. Ethnic differences (vascularization, left ventricle structure) can influence the CFR values. Also, obesity, smoking, hyperlipidemia, elevated values of low-density lipoproteins (LDL), arterial hypertension, diabetes mellitus, and obstructive sleep apnea in a healthy population can have a negative effect on CFR values.

Conclusion: There is evidence of the effect of risk factors for CAD on CFR values in a population without established pathology.[1-3] It is a marker of the early stages of coronary atherosclerosis (a tool in the stratification of patients regarding cardiovascular risk, and it could be a guide in the primary prevention of cardiovascular disease). Also, TTE-CFR<2 has good sensitivity and specificity to predict the significance of stenosis. Clinical presentation of the patient should be a part of the mosaic of interpretation of test results. CFR is an additional test, and stress echocardiography presents the first choice in the evaluation of ischemic heart disease.

RECEIVED:
November 4, 2022

ACCEPTED:
November 10, 2022

LITERATURE

1. Ciampi Q, Zagatina A, Cortigiani L, Gaibazzi N, Borguezan Daros C, Zhuravskaya N, et al; Stress Echo 2020 Study Group of the Italian Society of Echocardiography and Cardiovascular Imaging. Functional, Anatomical, and Prognostic Correlates of Coronary Flow Velocity Reserve During Stress Echocardiography. J Am Coll Cardiol. 2019;74(18):2278-2291. https://doi.org/10.1016/j.jacc.2019.08.1046
2. Rigo F. Coronary flow reserve in stress-echo lab. From pathophysiologic toy to diagnostic tool. Cardiovasc Ultrasound. 2005 Mar 25;3:8. https://doi.org/10.1186/1476-7120-3-8
3. Simova I. Coronary Flow Velocity Reserve Assessment with Transthoracic Doppler Echocardiography. Eur Cardiol. 2015 Jul;10(1):12-18. https://doi.org/10.15420/ecr.2015.10.01.12