MICROVASCULAR ANGINA: ETIOLOGY, CLINICAL MANIFESTATIONS, AND DIAGNOSTIC AND THERAPEUTIC APPROACH

M.O. Otabekova
Clinical Resident, Republican Specialized Scientific and Practical Medical Center of Cardiology bobonazarovamunisa007@gmail.com
D.I. Kuddusov
Clinical Resident, Republican Specialized Scientific and Practical Medical Center of Cardiology ddavronbek1998@gmail.com
Kh.M.Kholmonov
Clinical Resident, Republican Specialized Scientific and Practical Medical Center of Cardiology Xumoyun211298@gmail.com
M.A.Kambarova
Clinical Resident, Republican Specialized Scientific and Practical Medical Center of Cardiology drmadina08071999@gmail.com

Background

Microvascular angina (MVA) is one of the common clinical manifestations of myocardial ischemia in the absence of hemodynamically significant stenosis of the epicardial coronary arteries. According to contemporary studies, MVA is identified in approximately 20–30% of patients referred for coronary angiography because of typical anginal symptoms and is more frequently diagnosed in women, particularly during the postmenopausal period. Delayed diagnosis of this condition may contribute to the persistence of symptoms, deterioration in quality of life, increased risk of cardiovascular complications, and recurrent hospitalizations.

Objective

To systematize current evidence on the etiopathogenesis and clinical manifestations of microvascular angina and to optimize the diagnostic and therapeutic approach to

patients with this condition.

Keywords

microvascular angina; coronary microvascular dysfunction; myocardial ischemia; coronary flow reserve; index of microvascular resistance; endothelial dysfunction; epicardial coronary arteries; angina pectoris; cardiovascular risk factors; diagnostic approach; pharmacological therapy.

Materials and Methods

A review of contemporary national and international scientific publications, clinical guidelines of the European Society of Cardiology (ESC) and the American Heart Association (AHA), as well as the results of major clinical studies addressing coronary microvascular dysfunction was performed.

Results

The pathophysiological basis of microvascular angina is impaired function of the coronary microcirculation, particularly the small coronary arterioles, associated with endothelial dysfunction, inflammation, vascular remodeling, increased microvascular resistance, and reduced coronary flow reserve. The major cardiovascular risk factors include arterial hypertension, diabetes mellitus, dyslipidemia, obesity, smoking, chronic inflammation, and the postmenopausal state in women.

Clinically, microvascular angina may present with typical or atypical anginal chest pain occurring during physical exertion or emotional stress. In some patients, symptoms may persist after cessation of exercise and may demonstrate a relatively limited response to nitrates. In most cases, invasive coronary angiography does not reveal obstructive lesions of the epicardial coronary arteries.

Diagnosis is based on a comprehensive assessment of clinical symptoms and the

results of electrocardiography, functional exercise testing, echocardiography, stress perfusion cardiac magnetic resonance imaging, and positron emission tomography. In selected patients, invasive assessment of coronary microvascular function may be performed using measurements of coronary flow reserve (CFR), the index of microvascular resistance (IMR), and acetylcholine provocation testing.

The therapeutic strategy includes comprehensive modification of cardiovascular risk factors, lifestyle interventions, and individualized pharmacological treatment. Depending on the clinical phenotype and underlying mechanism, β-blockers, angiotensin-converting enzyme inhibitors or angiotensin II receptor blockers, statins, and calcium channel blockers may be used. In patients with persistent symptoms, ranolazine, ivabradine, and other antianginal agents may be considered. Optimal control of blood pressure, lipid profile, glucose metabolism, and body weight is of particular importance.

Conclusion

Microvascular angina is an important cause of myocardial ischemia in patients without obstructive epicardial coronary artery disease. Timely identification of coronary microvascular dysfunction using contemporary functional diagnostic methods enables individualized therapeutic management, reduces the severity of anginal symptoms, improves quality of life, and may contribute to a reduction in adverse cardiovascular outcomes.

References

1. Arakelyan MG, Bockeria LA, Vasilyeva EY, et al. Atrial fibrillation and atrial flutter: Clinical Guidelines 2020. *Russian Journal of Cardiology*. 2021;26(7):4594.
2. Belkorey OS, Khasanov NR, Dyakova EN. The impact of atrial fibrillation on the development of in-hospital complications in acute myocardial infarction. *Medical*

Alphabet. 2016;2(28):25–27.

3. Zykov MV, et al. Atrial fibrillation in patients with acute myocardial infarction: incidence, clinical characteristics, and prognosis. *Cardiology*. 2019;59(11):5–12.
4. Mansurova MH, Suleymanov SF. Risk factors for acute myocardial infarction in patients of different age groups. *New Day in Medicine*. 2020;(1):270–272.
5. Radha B, Saiganov SA, Trofimova EV. Atrial fibrillation in myocardial infarction of different localizations. *Rational Pharmacotherapy in Cardiology*. 2015;11(1):25–30.
6. Alameddine AK, Visintainer P, Alimov VK. Blood transfusion and the risk of atrial fibrillation after cardiac surgery. *Journal of Cardiac Surgery*. 2014;29:593–599.
7. Alexin AA. Postoperative atrial fibrillation in thoracic surgery. *Vestnik Anesteziologii i Reanimatologii*. 2014;(2):71–78.
8. Rathore SS, et al. Acute myocardial infarction complicated by atrial fibrillation in the elderly: prevalence and outcomes. *Circulation*. 2000;101(9):969–974.
9. Rostagno C, Blanzola C, Pinelli F. Atrial fibrillation after isolated coronary surgery: incidence, long-term effects, and relationship with operative technique. *Heart, Lung and Vessels*. 2014;6:171–179.
10. Sadat B, et al. Atrial Fibrillation Complicating Acute Myocardial Infarction: Prevalence, Impact, and Management Considerations. *Current Cardiology Reports*. 2024;26(5):313–323.