Prevalence of lower extremity arterial disease, correlation with diastolic dysfunction of the left ventricle and plasma concentration of asymmetric dimethylarginine in the general population aged 40-65 years - a cross-sectional study

Livija Sušić[1,2]*, Lana Maričić[2,3], Kristina Kralik[2], Ines Šahinović[3], Tihomir Sušić[4], Marina Vidosavljević[1,5], Mateja Ćosić[1,6]

[1]Health Center of Osijek-Baranja County, Osijek, Croatia
[2]University Josip Juraj Strossmayer Faculty of Medicine Osijek, Osijek, Croatia
[3]University Hospital Center Osijek, Osijek, Croatia
[4]The Information Institute Osijek, Osijek, Croatia
[5]University Josip Juraj Strossmayer, Interdisciplinary postgraduate study Molecular Biosciences, Osijek, Croatia
[6]University Josip Juraj Strossmayer, Faculty of Dental Medicine and Health, Osijek, Croatia

KEYWORDS: peripheral artery disease, ankle-brachial index, left ventricular dysfunction, asymmetric dimethylarginine.

CITATION: Cardiol Croat. 2024;19(11-12):540. | https://doi.org/10.15836/ccar2024.540

***ADDRESS FOR CORRESPONDENCE**: Livija Sušić, Dom zdravlja Osječko-baranjske županije, Park kralja Petra Krešimira IV/6, HR-31000 Osijek, Croatia. / Phone: +385-98-9621-078 / E-mail: livija.susic@gmail.com

ORCID: Livija Sušić, https://orcid.org/0000-0001-7271-4449 • Lana Maričić, https://orcid.org/0000-0002-0311-8384
Kristina Kralik, https://orcid.org/0000-0002-4481-6365 • Ines Šahinović, https://orcid.org/0000-0001-8841-8871
Tihomir Sušić, https://orcid.org/0000-0002-8264-5384 • Marina Vidosavljević, https://orcid.org/0009-0007-0638-7970
Mateja Ćosić, https://orcid.org/0000-0003-2444-7029

Introduction: Although lower extremity arterial disease (LEAD) is the third leading cause of atherosclerotic morbidity, it is still underdiagnosed and undertreated. In most cases, it is discovered in advanced stages. Ankle-brachial index (ABI) is the first-line noninvasive diagnostic method for LEAD.[1-3] The primary goals of our research were: to determine the prevalence of LEAD in the general population and to compare it with the prevalence of two early predictors of endothelial dysfunction - left ventricular diastolic dysfunction (LVDD) and plasma concentrations of asymmetric dimethylarginine (ADMA). Secondary goal was to evaluate the effect of drugs on ADMA concentration.

Patients and Methods: We conducted a cross-sectional study which included 165 subjects from general population aged 40 to 65 years. We used transthoracic echocardiography to assess left ventricular diastolic function (LVDF). For assessment of LEAD we used ABI, and additionaly duplex ultrasound if ABI was ≤ 1.0 or ≥ 1.4. ADMA was determined from venous blood sample using ELISA method. Subjects were divided into 3 groups: the 1st group - with normal left ventricular diastolic function (LVDF), the 2nd group – with LVDD only and the 3rd group – with coexisting LVDD and LEAD.

Results: LEAD was confirmed in 21 (13%) participants, the majority were smokers, had diabetes mellitus, heart failure, coronary artery disease, atrial fibrillation and chronic kidney disease. Even 14 of them (67%) were asymptomatic. Participants with normal LVDF had the highest and those with coexisting LEAD and LVDD the lowest plasma ADMA values. Most antihypertensives, as well as acetylsalicylic acid, MRA, insulin and SGLT2 inhibitors reduced ADMA values, but the most powerful were statins.

Conclusion: We should look for LEAD more often, considering that the vast majority of patients are asymptomatic. Many drugs that we use today to treat dyslipidemia, hypertension, HF and DM improve endothelial function, but statins are the most effective.

RECEIVED:
October 10, 2024
ACCEPTED:
October 31, 2024

LITERATURE

1. Criqui MH, Matsushita K, Aboyans V, Hess CN, Hicks CW, Kwan TW, et al. Lower Extremity Peripheral Artery Disease: Contemporary Epidemiology, Management Gaps, and Future Directions: A Scientific Statement From the American Heart Association. Circulation. 2021 Aug 31;144(9):e171-e191. https://doi.org/10.1161/CIR.0000000000001005
2. Ziegler L, Hedin U, Gottsäter A. Circulating Biomarkers in Lower Extremity Artery Disease. Eur Cardiol. 2022 Mar 23;17:e09. https://doi.org/10.15420/ecr.2021.58
3. Mazzolai L, Teixido-Tura G, Lanzi S, Boc V, Bossone E, Brodmann M et al. 2024 ESC Guidelines for the management of peripheral arterial and aortic diseases. Eur Heart J. 2024 Sep 29;45(36):3538-3700. https://doi.org/10.1093/eurheartj/ehae179