Acta Scientific Clinical Case Reports

Volume 3 Issue 8 August 2022

Editorial

Significance of Inflammatory Biomarkers in Peripheral Arterial Disease Diagnosis and Prognosis

Alexandr Ceasovschih*, Victorita Sorodoc and Laurentiu Sorodoc

Department of Internal Medicine, Clinical Emergency Hospital "Sfantul Spiridon", Faculty of Medicine, Grigore T. Popa University of Medicine and Pharmacy, Iasi, Romania

***Corresponding Author:** Alexandr Ceasovschih, Department of Internal Medicine, Clinical Emergency Hospital "Sfantul Spiridon", Faculty of Medicine, Grigore T. Popa University of Medicine and Pharmacy, Iasi, Romania.

Received: March 24, 2022

Published: July 01, 2022

Keywords: Peripheral Arterial Disease; Atherosclerosis; Inflammation; Biomarkers; Diagnosis; Prognosis

Abbreviations

PAD: Peripheral Arterial Disease

Peripheral arterial disease (PAD) is a widespread group of vascular diseases, due to arterial stenosis or occlusion, in which blood flow in the affected limbs is reduced. It is estimated that PAD affects more than 230 million people worldwide. Due to the large number of asymptomatic PAD cases (>50% of PAD patients), it is difficult to accurately estimate the PAD prevalence. PAD is associated with traditional atherosclerosis risk factors, including age, smoking, dyslipidemia, arterial hypertension, diabetes mellitus, etc. In women, the PAD incidence is similar only in old age, whereas in patients under 65 years - it is reduced by about half, compared to men [1-6].

Atherosclerosis is the most common PAD etiology and accounts for >90% of PAD cases. Two main pathophysiological processes are involved in the atherosclerotic plaques progression: (1) gradual accumulation of lipids, monocytes, and fibers in the arterial intima and (2) endothelial cell apoptosis followed by atherosclerotic plaque rupture. Vascular remodeling and collateral circulation are natural compensatory mechanisms, in order, to reduce the consequences of the vascular narrowing on the circulating flow [7,8].

Endothelial dysfunction is one of the main processes underlying the vascular atherosclerotic lesions development. In recent decades, for early PAD diagnosis and PAD prognosis evaluation, acute and chronic inflammatory plasma biomarkers (acute phase reactants, markers of endothelial dysfunction, endothelial progenitor cells, inflammatory cytokines, etc.) have been proposed. Unfortunately, there are no ideal biomarkers, neither for PAD diagnosis, nor for therapeutic response monitoring. Importantly, inflammatory biomarkers have proven to be significant in PAD Leriche-Fontaine stages stratification, especially if coexisting diseases limiting the walking distance estimation are present (e.g., heart failure, decompensated cirrhosis, chronic obstructive pulmonary disease, diabetic sensorimotor peripheral neuropathy, degenerative hip osteoarthritis, gonarthrosis, lumbago, *claudicatio spinalis*, lymphedema, etc.) [5,7,9-11].

Moreover, in recent decades, several studies have shown the importance of long time PAD patients evaluation, in order to identify the practical utility value among the inflammatory biomarkers as predictors for PAD. One of these biomarkers is the C-reactive protein, which is a "benchmark" in the study of various «classic» (e.g., fibrinogen, erythrocyte sedimentation rate, interleukins, etc.) and «novel» (e.g., cistatin C, neopterin, β2-microglobulin, copeptin, etc.) biomarkers, which have proven their importance in predicting unfavorable prognosis in PAD patients [12-16].

Therefore, early PAD diagnosis using complex methods (anamnesis, clinical manifestations, ankle-brachial index, specific bi-

omarkers, etc.) at preclinical stages, and initiation of a integrated approach program for PAD patients (combating existing risk factors and initiating specific non-pharmacological, and pharmacological preventive therapy), will reduce the disability degree, will increase the life quality, and will improve the PAD patients prognosis. However, currently, no inflammatory biomarker has been found in clinical practice that would reflect accurately the PAD presence, as single test. Future research should focus not only on individual biomarkers study in PAD, but also on a multimarker approach, using combinations of various biomarkers.

Authors Contribution

All authors have read and agreed to the published version of the manuscript. All authors contributed equally to this work.

Conflict of Interest

The author declares no potential conflicts of interest.

Bibliography

1. Aboyans V., *et al.* "2017 ESC Guidelines on the Diagnosis and Treatment of Peripheral Arterial Diseases, in collaboration with the European Society for Vascular Surgery (ESVS)". *European Heart Journal* 39 (2018): 763-816.

2. Shu J., *et al*. "Update on peripheral artery disease: Epidemiology and evidence-based facts". *Atherosclerosis* 275 (2018): 379-381.

3. Ceasovschih A., *et al*. "Study Of Cardiovascular Risk Factors In Patients With Peripheral Artery Disease". *Atherosclerosis* 287 (2019): E190.

4. Aday AW., *et al.* "Epidemiology of Peripheral Artery Disease and Polyvascular Disease". *Circulation Research* 128.12 (2021): 1818-1832.

5. Ceasovschih A., *et al.* "Practical significance of non-invasive diagnosis score in peripheral artery disease: study on 1200 patients". *Atherosclerosis* 263 (2017): E186-E186.

6. Ceasovschih A., *et al.* "Peripheral artery disease particularities in women: a prospective study". *Atherosclerosis* 315 (2020): e168.

7. Funk SD., *et al.* "Ephs and ephrins resurface in inflammation, immunity, and atherosclerosis". *Pharmacology Research* 67.1 (2013): 42-52.

8. Ceasovschih A., *et al*. "Up to date in managementul bolii arteriale periferice. De la ghiduri la practică". *Revista Medicală Română* LXIV.1 (2017): 38-42.

9. Krishna SM., *et al*. "A Review of the Pathophysiology and Potential Biomarkers for Peripheral Artery Disease". *International Journal of Molecular Sciences* 16.5 (2015): 11294-11322.

10. Ceasovschih A., *et al.* "Biomarker Utility for Peripheral Artery Disease Diagnosis in Real Clinical Practice: A Prospective Study". *Diagnostics* 10.9 (2020): E723.

11. Ceasovschih A., *et al*. "Improving peripheral artery disease diagnosis: Results of a modern multimarker approach". *Atherosclerosis* 275 (2018): E119.

12. Tzoulaki I., *et al.* "C-reactive protein, interleukin-6, and soluble adhesion molecules as predictors of progressive peripheral atherosclerosis in the general population: Edinburgh Artery Study". *Circulation* 112.7 (2005): 976-983.

13. Kals J., *et al*. "β2-microglobulin, a novel biomarker of peripheral arterial disease, independently predicts aortic stiffness in these patients". *Scandinavian Journal of Clinical and Laboratory Investigation* 71.4 (2011): 257-263.

14. Ceasovschih A., *et al.* "A six-mounth evaluation of inflammatory biomarkers prognostic predictability in patients with peripheral artery disease". *Atherosclerosis* 331.e56e (2021): e293.

15. Signorelli SS., *et al*. "Neopterin: a potential marker in chronic peripheral arterial disease". *Molecular Medicine Reports* 7.6 (2013): 1855-1858.

16. Fatemi S., *et al*. "Copeptin, B-type natriuretic peptide and cystatin C are associated with incident symptomatic PAD". *Biomarkers* 24.6 (2019): 615-621.