

Peak-systolic velocity as independent risk factor for carotid artery stenosis?

 Amina Bičo*,
 Alden Begić,
 Dževdet Radončić,
 Mirza Dilić

Clinical Center University of Sarajevo, Sarajevo, Bosnia and Herzegovina

KEYWORDS: carotid artery stenosis, peak-systolic velocity, multiple risk factors.

CITATION: *Cardiol Croat.* 2018;13(11-12):443. | <https://doi.org/10.15836/ccar2018.443>

***ADDRESS FOR CORRESPONDENCE:** Amina Bičo, Clinic of Heart and Blood Vessel Diseases, Clinical Center University of Sarajevo, Bolnička 25, 71000 Sarajevo, Bosnia and Herzegovina. / Phone: +387-61-348-688 / Email: amina.osmanagic@yahoo.com

ORCID: Amina Bičo, <https://orcid.org/0000-0001-6937-1772> • Alden Begić, <https://orcid.org/0000-0002-5374-0892> Dževdet Radončić, <https://orcid.org/0000-0001-5917-2956> • Mirza Dilić, <https://orcid.org/0000-0002-7309-1455>

Introduction: There are a very few studies analyzing blood flow velocity parameters of internal carotid arteries (ICA), measure with Color Doppler examination, as an independent risk factor for carotid stenosis (CSt). In everyday clinical practice we have a number of patients (pts) with carotid stenosis but with borderline or slightly increased peak-systolic velocity and these findings are not in line with current guidelines.¹⁻³ In grading of CSt we used University of Washington Duplex criteria and in calculation of cardiovascular risk factor score we used SCORE charts. We performed this study to compare data of blood flow velocity parameters and risk factor score with grading of CSt.

Methods and Results: We included total of 92 consecutive patients with CSt 50-70% (n=50) and CSt >70% (n=42). Out of them with CSt 50-70%, were 38 males, age of 58.2±10.4 and 8 females, age 59.7±5.8, and with CSt >70%, were 41 males, age of 60.1±6.2 and 9 females, age of 61.3±6.4. Velocity parameters were: peak-systolic velocity (PSV) and end-diastolic velocity (EDV). Measurement was performed on proximal portion of ICA. In the group of CSt 50-70%, ICA hemodynamic parameters were: PSV 106±18.5 cm/s, EDV 37.8±8.7 cm/s, and in the group of CSt >70% ICA parameters were: PSV of 139±12.4 cm/s. and EDV 41.8±5.7 cm/s. PSV revealed a borderline significant association with group of CSt >70%, p<0.07, vs group of CSt 50-70% where PSV was 106 cm/s, p=0.2. Difference in EDV was of no significance in both groups, p=0.1. We calculated five risk factors, according to SCORE high-risk charts i.e. clinical variables: age, gender, tobacco smoking, hypertension and total cholesterol. Due to multiple risk factors we found significance for the following variables: in the group of CSt >70%, regression logistic test, with 95% CI, was performed and we got for the CSt >70%, significance for age, hypertension and smoking, p<0.05, and in the group of CSt 50-70% clinical variables, age and hypertension was of significance, p<0.01.

Conclusion: Increased PSV ≥ 139 cm/s, revealed a borderline association with CSt >70%, and risk factors age, hypertension and smoking were significantly connected to CSt >70%. In the group of CSt 50-70%, PSV of ≥ 106 cm/s was of no significance but age and hypertension were of significant connection. EDV was of no significance in both groups.

RECEIVED:
October 23, 2018

ACCEPTED:
November 5, 2018



LITERATURE

- Byrnes KR, Ross CB. The current role of carotid duplex ultrasonography in the management of carotid atherosclerosis: foundations and advances. *Int J Vasc Med.* 2012;2012:187872. <https://doi.org/10.1155/2012/187872>
- Mortimer R, Nachiappan S, Howlett DC. Carotid artery stenosis screening: where are we now? *Br J Radiol.* 2018 Oct;91(1090):20170380. <https://doi.org/10.1259/bjr.20170380>
- Lin JC, Kabbani LS, Peterson EL, Masabni K, Morgan JA, Brooks S. Clinical utility of carotid duplex ultrasound prior to cardiac surgery. *J Vasc Surg.* 2016 Mar;63(3):710-4. <https://doi.org/10.1016/j.jvs.2015.10.008>