



SYMPTOMATIC INTRACRANIAL STENOSIS: PROSPECTIVE TRANSCRANIAL DOPPLER STUDY OF HOSPITALIZED ISCHEMIC STROKE POPULATION



V Puglisi¹, L Vinciguerra¹, A Catalano¹, G Pennisi², M Zappia¹, R Bella³

¹Department "G.F. Ingrassia", Section of Neurosciences, University of Catania, Via Santa Sofia, 78-95123 Catania, Italy

² Department of Surgery and Medical-Surgical Specialties, University of Catania, Via Santa Sofia, 78-95123 Catania, Italy

³ Department of Medical and Surgical Sciences and Advanced Technologies, Section of Neurosciences, University of Catania, Via Santa Sofia, 78-95123 Catania, Italy

Introduction: In Caucasian patients with acute ischemic stroke due to symptomatic intracranial atherosclerotic stenosis (ICAS), only limited data on prevalence and its associated risk factors have been reported. In view of identify patients at high risk requiring more aggressive secondary prevention, taking into account the high recurrence rate [1], we aimed to investigate the prevalence, distribution and the risk factors predisposing ICAS among hospitalized ischemic stroke population, in a prospective Transcranial Doppler Sonography study.

Materials and methods: Consecutive patients with a first-ever acute ischemic stroke were prospectively evaluated for the prevalence of ICAS ($\geq 50\%$ luminal narrowing) with Transcranial Color-Coded Doppler Sonography (TCCS) or Transcranial Doppler (TCD), according to validated criteria [2], during a 2 years period. Intracranial stenosis was defined as symptomatic if the infarct was related to the territory of the stenotic artery detected by TCCS or TCD and confirmed by magnetic resonance angiography or computed tomography angiography. Patients with ICAS and any cardiac arrhythmia or other possible cause of ICAS than atherosclerosis were excluded. The association of potential risk factors with ICAS was analysed.

Results: A total of 220 consecutive patients (mean age 68.2 ± 13.6 years, 52.7% men) were evaluated. ICAS was documented in 21 patients (9.5%). If we consider only the Caucasian (216, 98.2%), ICAS was detected in 9.7% of patients. The most common ICAS location was the anterior circulation. Patients with ICAS were more likely to have hypertension, diabetes mellitus, hypercholesterolemia, elevated plasma fibrinogen and a higher proportion of concomitant extracranial carotid/vertebral asymptomatic $\geq 50\%$ stenosis than patients without ICAS. Hypercholesterolemia (OR: 2.73; 95% CI: 1.00-7.47; $p < 0.05$), plasma fibrinogen (OR: 1.03; 95% CI: 1.00-1.07; $p < 0.05$) and extracranial carotid/vertebral $\geq 50\%$ stenosis (OR: 3.26; 95% CI: 1.19-8.90; $p < 0.05$) were independently associated with ICAS on multivariate models adjusting for potential confounders.

Site of Symptomatic Intracranial Atherosclerosis

Location	Patients with ICAS n [% of study population]
Anterior circulation	17 [7.7]
MCA	10
TICA	6
ACA	1
Posterior circulation	4 [1.8]
VA	2
BA	1
PCA	1
Total	21 [9.5]

ACA, anterior cerebral artery; MCA, middle cerebral artery; TICA, terminal internal carotid artery; VA, vertebral artery; BA, basilar artery; PCA, posterior cerebral artery.

Univariate and multivariate analyses of the variables associated with ICAS.

Predictor	Univariate analysis OR (95% CI)	Multivariate analysis OR (95% CI)
Hypertension	8.63 (1.13-65.8)*	4.30 (0.53-34.85) ns
Diabetes mellitus	2.61 (1.05-6.48)*	2.33 (0.85-6.34) ns
Hypercholesterolemia	2.51 (1.01-6.26)*	2.73 (1.00-7.47) *
Fibrinogen	3.52 (1.40-8.83)*	1.03 (1.00-1.07) *
Carotid/vertebral $\geq 50\%$ stenosis	4.53 (1.74-11.77)*	3.26 (1.19-8.90) *

CI confidence interval, OR odds ratio, *p values < 0.05 , ns=not significant

Conclusion: ICAS was surprisingly observed in a noteworthy number of Caucasian stroke patients, suggesting that its prevalence may be underrecognized in Caucasian population. The association of ICAS and elevated plasma fibrinogen rate may indicate a prominent role for inflammatory factors in intracranial atherosclerotic disease [3]. Moreover, ICAS was independently associated with extracranial carotid/vertebral $> 50\%$ stenosis and hypercholesterolemia. These findings support the systematic use of Neurosonology in the diagnosis of vascular status and in therapeutic decision-making of acute ischemic stroke.

References:

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