

PREVALENCE OF PFO IN A CONSECUTIVE SERIES OF PATIENTS WITH CRYPTOGENIC STROKE AT HIGH SUSPICION OF EMBOLIC GENESIS

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Background: Cryptogenic strokes (CS) account for about 25% of all ischemic strokes and in most cases it has been hypothesized a thromboembolic mechanism. Embolic stroke of undetermined source (ESUS) refers to patients with embolic stroke for whom the embolic etiology remains undefined despite thorough investigations. According to the 10-point Risk of Paradoxical Embolism score (RoPEs) the association between PFO and ESUS depends on patient's age, presence of traditional risk factors (RF), and type of cerebral infarction (Figure 1). The aim of this study was to evaluate the prevalence of PFO in patients with CS and probable stroke-related PFO and the correlation with neuroimaging findings.

Characteristic	Points	Score
No history of hypertension	1	
No history of diabetes	1	
No history of stroke or TIA	1	
Nonsmoker	1	
Cortical infarct on imaging	1	
Age (y)		
18-29	5	
30-39	4	
40-49	3	
50-59	2	
60-69	1	
≥ 70	0	
Total score (sum of individual points)		
Maximum score (a patient < 30 y without vascular risk factors, no history of stroke or TIA, and cortical infarct)		10
Minimum score (a patient ≥ 70 y with vascular risk factors, prior stroke, and no cortical infarct)		0

Figure 1. RoPE score calculator. Int.J.Stroke 2013;8:612-619

Methods: We prospectively evaluated 48 patients with CS and a RoPEs>5. Simultaneous TCD with TTE and TCD with TEE were performed using agitated saline solution at baseline and after VM. We recorded for all patients age, gender, body mass index (BMI) and the presence of hypertension, diabetes, hypercholesterolemia, smoking, history of stroke/TIA, coagulopathy, deep vein thrombosis (DVT), pulmonary embolism (PE) and atrial septal aneurysm (ASA).

Results: Thirty-two (66%) of 48 patients were diagnosed with PFO. No difference was found between patients with and without PFO about gender, mean±SD age at stroke onset, BMI, hypertension, hypercholesterolemia, diabetes, coagulopathy and the other RF. DVT was identified in 1 patient in the group without PFO while 9.3% of patients with PFO and none of those without PFO had signs of EP. The ASA was detected in 50% of patients with PFO (P<0.001). The RoPEs median in patients with PFO was similar to that found in those without PFO (7; IQR:5.5-8 vs. 7.5;IQR:6-8. P=0.525). Multiple infarcts were found at brain MRI in 39,6% of patients with PFO and 12,5% in those without PFO (P=0.048) with no differences between anterior and posterior circulation involvement in the two groups (P=0.084) (Figure 2).

PRINCIPAL FEATURES	PFO POSITIVE (n 31)	PFO NEGATIVE (n 17)	P
Age (mean ± SD)	57.4 ± 11.9	57.9 ± 12.1	0.893
BMI (mean ± SD)	24.7 ± 4.7	26.6 ± 4.1	0.924
Hypertension (%)	46.9	56.2	0,054
Hypercholesterolemia (%)	68.8	56.2	0.386
Coagulopathy (%)	6.2	12.5	0.592
Diabetes (%)	9.4	18.8	0.386
ASA (%)	50	5	<0.001
RoPEs (median)	7	7.5	0.525
Multiple Infarct at brain MRI(%)	39.6	12.5	0.048

Figure 2. Main characteristics between the two groups

Discussion and Conclusion: In the present study we found that about two-thirds of patients with CS and high RoPE score had PFO. However, we did not find any difference in the prevalence of vascular risk factors and in the RoPE score between patients with and without PFO. Conversely, the presence of ASA and of multiple infarcts at brain neuroimaging would suggest the presence of PFO in patients with CS also fulfilling ESUS criteria. Further studies are needed to establish the connection, if any, among CS, ESUS, and PFO.

References:

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