Frequency and clinical implications of hypercoagulability states in a cohort of patients with MA

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BACKGROUND

Patients affected by Migraine with Aura (MA) present a higher cerebrovascular risk respect to general population, in particular for cardioembolic or criptogenetic stroke [1]; this may be in part linked to the higher prevalence of patent foramen ovale (PFO) in these patients [2]. Few studies reported conflicting findings on the association of MA with hypercoagulability states, but a study on patients with stroke and history of migraine showed a possible association with higher frequency of hypercoagulability states [3].

We aimed at evaluating:

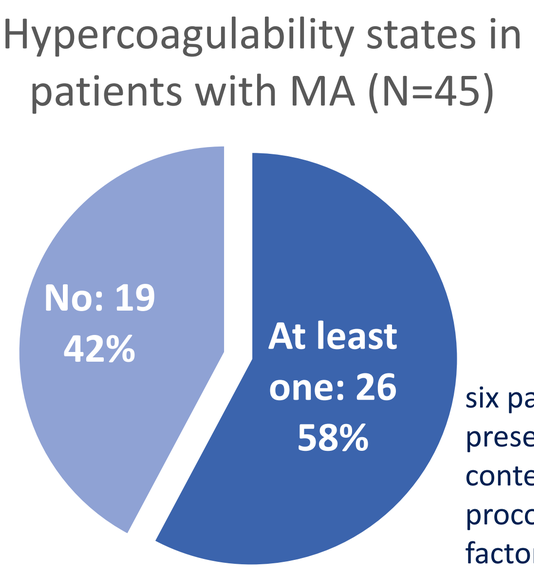
1) the frequency of hypercoagulability state in patients with MA in our Headache Center.
2) If there are differences in PFO frequency in patients with MA with or without hypercoagulability states
3) If there are differences in the characteristics of aura between MA patients with or without hypercoagulability states

METHODS

We retrospectively reviewed consecutive MA patients visited in our Headache Center with a thrombophilic screening complete of MTHFR C677T and A1298C mutations, factor V mutation, factor II mutation, antiphospholipid antibodies panel, protein C and S dosage. In a subgroup of these patients, we performed transcranial Doppler (TCD) for PFO screening; we then compared the rate of PFO in patients with and without hypercoagulability states. Further, we examined if a hypercoagulability state influences clinical characteristics of aura (frequency, type and duration).

RESULTS

MA patients N=45
Female: 44 (97,7%)
Mean age: 36,3 yo

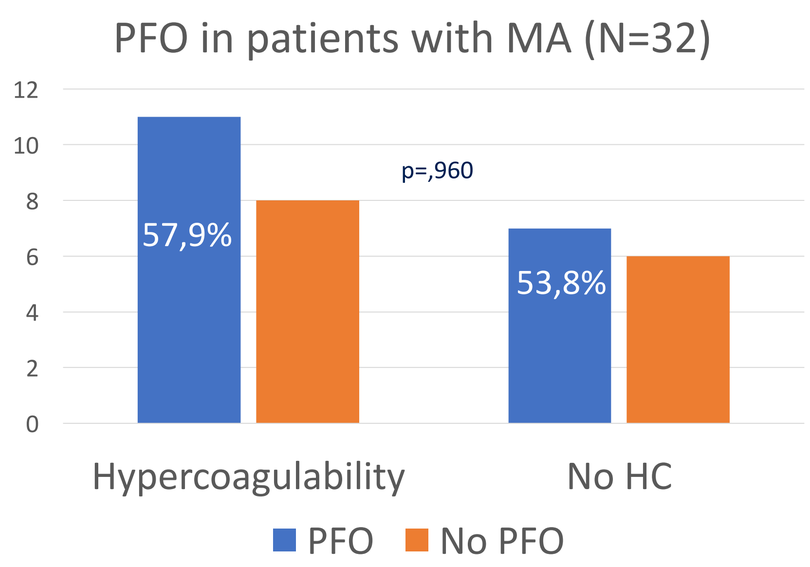


six patients presented 2 contemporary procoagulant factors

Migraine with Aura N= 45		Similar adult population	Stroke patients
MTHFR C677T Hom	14 (31,1%)	14,5[D] - 18%[C] (Italy)	21% (<45 y-o, Italy)[D]
MTHFR A1298C HT	3 (6,7%)	--	--
Factor V HT	2 (4,4%)	3,2%[D] - 4,1%[A] – 5,3%[B]	3,7% (<45 y-o)[D] - 7,5% (<50 y-o) [A]
Prothrombin G20210A HT	1 (2,2%)	1,7-3%[B],[D]	4,9% (<45 y-o)[D]
Antiphospholipid antibodies (aPL)	5 (11,1%)	4,3%[E]	9,7% - 12,5% (>50 yo)[E]
Protein C or S deficiency	6 (13,3%)	(Inherited deficiencies <1%) [B]	

The 58% of our population of MA patients present at least one procoagulant factor, the most common of which is homozygosis for MTHFR C677T polymorphism.

[A] Hamedani, Stroke 2010
[B] Kalaria, Neurol Clin 2015
[C] Botto, Am J Epidemiol 2000
[D] Pezzini, Stroke 2005
[E] APASS Group, Neurology, 1997



Prevalence of PFO from literature
In general population: 16-25,7%
In MA patients: 3.4 fold

Takagi, J Cardiol 2015

In our cohort, PFO presents similar frequency in MA patients with or without hypercoagulability states; both groups have higher rate of PFO than literature data for general population and similar rate to literature data for MA patients

Characteristics of aura: differences between groups (HS vs No HS)	
Frequency (attacks/year)	p=,533
Type (V / V+P / V+P+A)	p=,529
Duration (min)	p=,909

In our cohort of MA patients, hypercoagulability states do not influence clinical characteristics of aura.

DISCUSSION

A hypercoagulability states can be commonly found in patients with MA although it can not be predicted by clinical characteristics of aura.

PFO presents the same frequency in MA patients with or without hypercoagulability states, and is 3 fold the rate of general population.

Given the high prevalence of both conditions and the higher risk of stroke in MA patients, it seems reasonable that patients with MA that present a PFO should be screened for the presence of hypercoagulability states.

BIBLIOGRAPHY

1. Androulakis XM, Rosamond W, Yim E, Dennis LC, Gottesman R, Sen S. Abstract TP179: Ischemic Stroke Subtypes and Relationship With Migraine in the Atherosclerosis Risk in Communities Study. Stroke 2016; 47: ATP179–9.
2. Takagi H, Umemoto T, ALICE (All-Literature Investigation of Cardiovascular Evidence) Group. A meta-analysis of case-control studies of the association of migraine and patent foramen ovale. Journal of Cardiology 2015; published online Oct 30. DOI:10.1016/j.jjcc.2015.09.016.
3. Martinez-Sanchez P, Martinez-Martinez M, Fuentes B, et al. Migraine and hypercoagulable states in ischemic stroke. Cephalalgia 2011; 31: 1609–17.