Clinical and biological characteristics of cerebral amyloid angiopathy, a case series

Pelusi L. [1], Cenacchi V. [1], Palacino F. [1], Lombardo T.M.I [1], Capacchione F [1], Cattaruzza T. [2], Benussi A. [1-2], Manganotti P. [1-2]

1 Neurology Unit, Department of Medical, Surgical and Health Sciences, University of Trieste, Trieste, Italy
2 Neurology Unit, Department of Medicine, Surgery and Health Sciences, Azienda Sanitaria Universitaria Giuliano Isontina, Trieste, Italy

Background and aims:

Early identification of cerebral amyloid angiopathy (CAA) may have important clinical implications. The Boston Criteria 2.0 allow for in vivo diagnosis with good accuracy, but they require magnetic resonance imaging (MRI), which is not always readily available. Plasma biomarkers are extensively validated in Alzheimer's disease (AD) but have been less explored in CAA.

Methods:

We identified patients under the age of 80 who presented with spontaneous lobar intracerebral haemorrhage (ICH). Within 72 hours of the event, blood samples were collected to analyse plasma levels of amyloid-β $(Aβ)_{1-42}$, $Aβ_{1-40}$, phosphorylated tau $(pTau)_{181}$, and $pTau_{217}$. All patients subsequently underwent MRI to assess for "probable CAA" according to the Boston Criteria. The Mann–Whitney U test was used to compare biomarker levels between patients with probable CAA and those with other diagnoses.

Results:

Thirteen patients were included, nine of whom met criteria for probable CAA. Compared to non-CAA patients, those with CAA were older, similarly affected by arterial hypertension, and more frequently treated with antiplatelet or anticoagulant therapy. CAA patients showed lower plasma levels of $Aβ_{1-42}$ and $Aβ_{1-40}$ and higher levels of $pTau_{181}$ and $pTau_{217}$. However, the Mann–Whitney U test did not reveal statistically significant differences between groups.

Discussion:

Recent studies have shown reduced Aβ and elevated pTau levels in the plasma of patients with CAA compared to healthy controls. Our results confirm this trend, although statistical significance was not achieved—likely due to the small sample size.

Figure 1. Methods illustration.

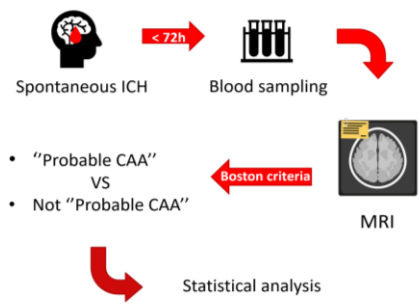

Figure 2. Demographic and clinical characteristics of included participants

	Probable CAA	Not Probable CAA
N	9	4
Age, years	74 (69-77)	69 (63.8-72.5)
Education, years	8 (8-9.25)	13 (11-14.25)
BMI	24.9 (23.8-25.7)	27 (24.6-29)
Smoker or ex-smoker	37.5%	75%
Hypertension	67%	50%
Dyslipidemia	33%	50%
Antiplatelet therapy	45%	0%
Anticoagulant therapy	22%	0%

Data are reported as median (interquartile-range) or %.

Figure 3. Blood-based biomarkers in both groups.

	Probable CAA	Not Probable CAA
N	9	4
$pTau_{217}$	0.156 pg/mL (0.102-0.237)	0.08 pg/mL (0.069-0.057)
$pTau_{181}$	1.57 pg/mL (0.63-1.65)	0.90 pg/mL (0.57-1.33)
$Aβ_{1-42}$	23.99 pg/mL (20.29-24.77)	25.48 pg/mL (20.7-29.25)
$Aβ_{1-40}$	259 pg/mL (239.26-280.55)	276.76 pg/mL (248.7-317.7)

Data are reported as median (interquartile-range).

Conclusions: Plasma Aβ and pTau levels are promising biomarkers for identifying CAA-related aetiology in patients with lobar ICH. Larger studies are needed to confirm their diagnostic value and support their integration into early diagnostic workflows