# Conjuring comprehension of amyloid spells
# An unexpected presentation of psychosis and catatonic symptoms in a patient with Cerebral Amyloid Angiopathy

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## Background

- Cerebral amyloid angiopathy (CAA) is a cerebrovascular disorder caused by amyloid-beta deposits within vessels of the brain and leptomeninges that disproportionally affects racially/ethnically minoritized populations (Copenhaver, 2008)
- CAA is a common cause of lobar hemorrhage and cognitive impairment in older adults (Viswanathan et al., 2011)
- May also present with transient neurological symptoms, incidental microbleeds, and hemosiderosis on imaging
- CAA-related inflammation (CAA-RI) is a subtype that develops from an inflammatory response to amyloid deposition
    - CAA-RI can lead to memory impairment, confusion, personality changes, seizures, alterations in level of consciousness, and psychosis (Chung et al., 2010)
    - Transient focal neurologic episodes (termed "amyloid spells") are seen in 15% of cases (Charidimou, 2014)
- Can be challenging to identify due to symptomatic overlap with other conditions

## Objectives

- To discuss symptoms, pathophysiology, and treatment of CAA, as well as its overlapping features with neurological and psychiatric conditions
- To highlight the importance of accurate diagnosis, especially in racially/ethnically minoritized populations who are disproportionately affected by CAA and by misdiagnosis of psychotic illnesses

## Case Overview

67-year-old, Guyanese male, no psychiatric or substance use history, +FH bipolar disorder in father, medical history of seizures, chronic microhemorrhages, and hypertension, two recent medical hospitalizations for vertigo and cognitive decline with unspecified psychosis who presents with worsening cognitive decline, failure to thrive, and increased paranoia.

## Cognitive Decline Timeline

4/2022 – Memory impairment beings

7/2022 – Outside hospital admission for vertigo
- Brain imaging: trace left frontal subarachnoid hemorrhage, chronic microhemorrhages, and subacute small infarcts multiple territories

9/2022
- Sued by former client related to cabinet business

10/2022 – Outside hospital emergency department visit for suicidal ideation and anxiety
- Worsening confusion, new onset auditory hallucinations (does not specify), and paranoia (i.e., Expresses fear people are following him)
- Cleared by psychiatry and discharged

10/22 - outside hospital admission for cognitive decline x 2 weeks
- MRI revealed chronic lacunar infarcts; chronic subarachnoid hemorrhage
- Psychiatry consulted for psychosis (visual hallucinations (VH) and paranoia)→ started on lorazepam 0.5mg QHS and risperidone 0.25mg QHS

## Hospital Course

*Presents to ED with worsening confusion and paranoia*

*Neurology consulted and accepts admission:*
- Initial differential: CAA-RI, autoimmune encephalitis,
- neurosyphilis, Lewy Body Dementia, sequalae of prior TBI, or primary psychiatric process
- recommended discontinuing aspirin

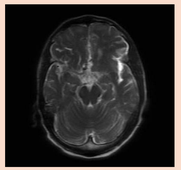

Image 1 (MR Brain with and without IV contrast): Depicts +hemosiderin staining and peripheral microhemorrhage

*Psychiatry consulted:*
- Mental status exam: dysphoric, paranoid, thought blocked, and disorganized
- Initial differential: encephalitis, dementia, delirium, and psychotic depression.
- Started on olanzapine

*Non-responsive episodes (>5 throughout course):*
- Initially responsive to lorazepam (thought to be seizure vs. catatonia); later followed by sedation on lorazepam
- Oxcarbazepine briefly increased without clear benefit; VEEG negative→ decreased to home dose

*Work-up continued:*
- MRB: +hemosiderin staining (See Image 1)
- LP: grossly negative apart from elevated p-Tau/Abeta42 ratio (non-specific for Alzheimer's dementia)
- PET CT: non-specific decrease FDG activity in precuneus, parietal convexities; medial occipital and posterior temporal cortices; frontal cortices.

*Worsened paranoia and VH (e.g., spiders on walls)*
- Improved with Seroquel, which worsened somnolence/catatonic symptoms

*CAA-RI considered → Neurosurgery consulted for craniotomy and meningeal biopsy*
- Biopsy pathology: +beta-amyloid deposition in vascular channels (without significant inflammatory infiltrate

*Treatment: 1g IV Methylprednisone x 5 days, cyclophosphamide 920mg*

*Discharged on prednisone 60mg daily with outpatient follow-up with neurology and rheumatology*

## Post-discharge Follow-up

- 2 weeks (neurology): cognition improved; psychosis resolved (on 60mg prednisone; status post cyclophosphamide x1)
- 5 months (neurology): cognition stable; occasional paranoia; (on prednisone 5mg; status post cyclophosphamide x 3)

## Results

Accurate diagnosis and treatment of CAA-RI contributed to:
- Improved quality of life
- Reduction in symptoms (e.g., improved cognition, reduced paranoia, reduced episodes of amyloid spells)
- Reduced hospitalizations (see table 1)

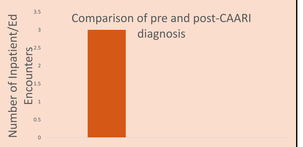


Table 1: Comparison of hospitalizations 6 months before (*left*) and 6 months after (*right*) CAARI diagnosis and treatment. No hospitalizations 6 months following diagnosis and treatment.

## Discussion

- CAA is a common neurologic condition, especially in the elderly, however, its neuropsychiatric sequalae may be difficult to diagnose given overlapping features with seizures, catatonia, and psychiatric disorders, among other diagnoses
- X.X.'s non-responsive episodes were initially formulated to be TIA vs. seizures and were later reformulated as amyloid spells
- There are numerous harms in missed or delayed diagnosis (e.g., stigma, inappropriate treatment and associated healthcare cost, etc.)

## Conclusion

- Collaborative care involving C-L and other relevant specialties in cases like these is imperative
- C-L should remain vigilant to psychological sequelae of neurologic conditions such as CAARI
- CAA-RI may be a less likely to be considered for psychosis in racially/ethnically minoritized populations given increased risk of misdiagnosis with primary psychotic disorder (Schwartz et al., 2014)
- Obtaining swift imaging and neurology input may alleviate prolonged suffering and reduce the risk of misdiagnosis

## References

- Charidimou A, et al. Spectrum of transient focal neurological episodes in cerebral amyloid angiopathy: multicentre magnetic resonance imaging cohort study and meta-analysis. Stroke. 2012;43:2324-30.
- Copenhaver, BR., et al. Racial Differences in Microbleed Prevalence in Primary Intracerebral Hemorrhage. Neurology. 2008; 71:1176-1182.
- Schwartz RC, Blankenship DM. Racial disparities in psychotic disorder diagnosis: A review of empirical literature. World J Psychiatry. 2014; 4:133-40.
- Viswanathan A, Greenberg SM. Cerebral amyloid angiopathy in the elderly. Ann Neurol. 2011 Dec;70(6):871-80. doi: 10.1002/ana.22516. PMID: 22190361; PMCID: PMC4004372.
- Chung KK, Anderson NE, Hutchinson D, Synek B, Barber PA. Cerebral amyloid angiopathy related inflammation: three case reports and a review. J Neurol Neurosurg Psychiatry. 2011 Jan;82(1):20-6. doi: 10.1136/jnnp.2009.204180. Epub 2010 Oct 9. PMID: 20935328.

## Disclosures

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