Ongoing Research at Emory/Children's Healthcare of Atlanta

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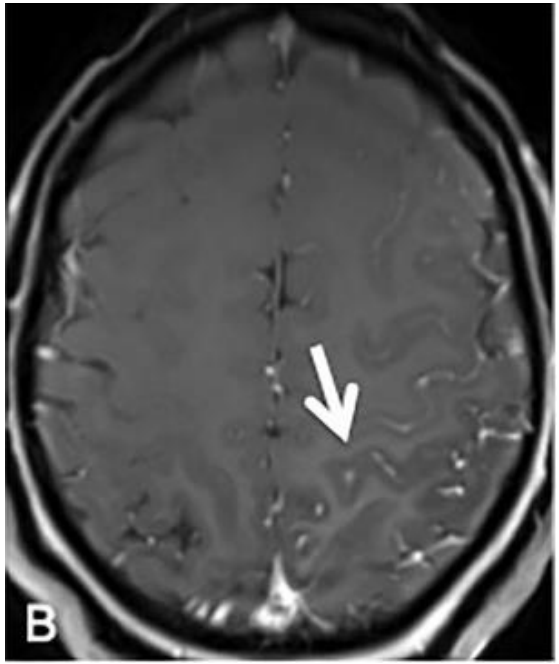
Prospective patient registry

- Collect blood and cerebrospinal fluid
- Advanced MRI techniques
- Clinical and treatment data

MOGAD and leptomeningeal enhancement (LME)

Presenting symptoms of meningoencephalitis

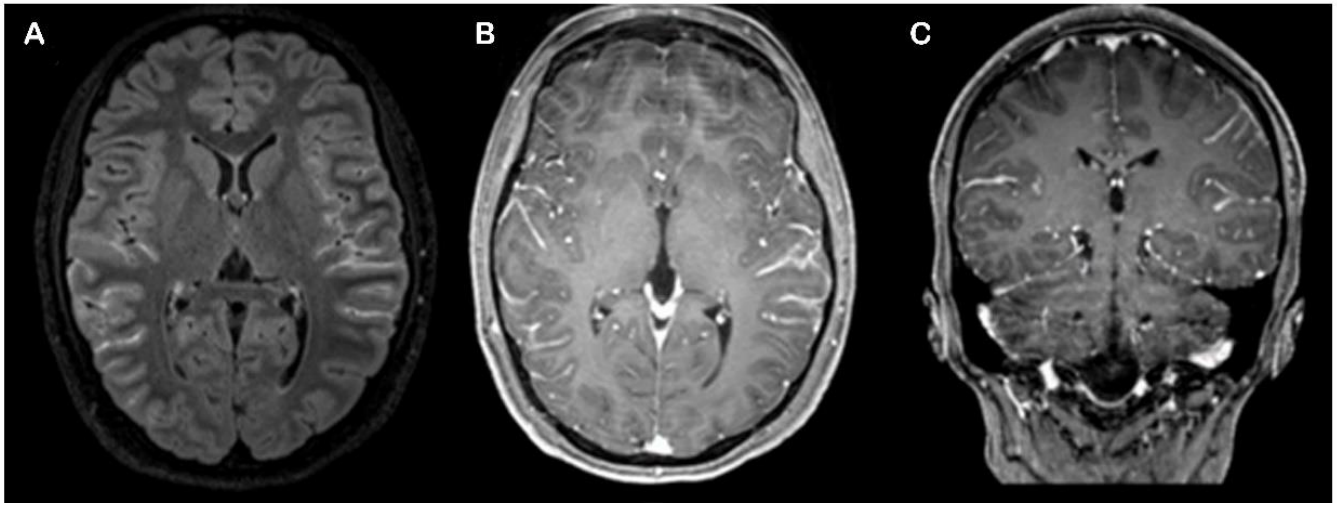
- Fevers
- Encephalopathy (up to weeks)
- “Stroke-like”
- Increased opening pressure
- Later on develop demyelination
- Cerebral cortical encephalitis
- FLAMES: Unilateral Flair Lesions in MOG-associated Encephalitis with Seizures



Tutmaher**.** PedNeur. 2020 Jul;108:123-125. **Gombolay GY,**J Neuroimmunol. 2021 Sep 15;358:577653; Gadde JA**.** J Child Neurol. 2021 Oct;36(11):1042-1046. Budhram A et al.. JAMA Neurol. 2020 May 1;77(5):648-649. Goldman-Yassen, Lee, **Gombolay,** PedNeur 2024, PMDI 38382244. Elsbernd J Neurol Neurosurg Psychiatry. 2023 May 23: PMID: 37221051. Banwell et al., Lancet Neurol. 2023: PMID: 36706773

Meningitis and MOGAD

- Meningitis was identified in 34/810 (4%: first attack[n=25]; relapse[n=9]) MOGAD patients



Aboseif…Flanagan EP. JAMA Neurol. 2025 Jun 16;82(8):871–3. PMCID: PMC12340653.

MOGAD and leptomeningeal enhancement (LME)

- In children with MOGAD
- 7/21 (33%) MOGAD had LME
  - 0 in 20 MS and in 0/7 AQP4 NMOSD
  - **LME = neuroimaging biomarker for MOGAD**

- 5% of LME is MOGAD

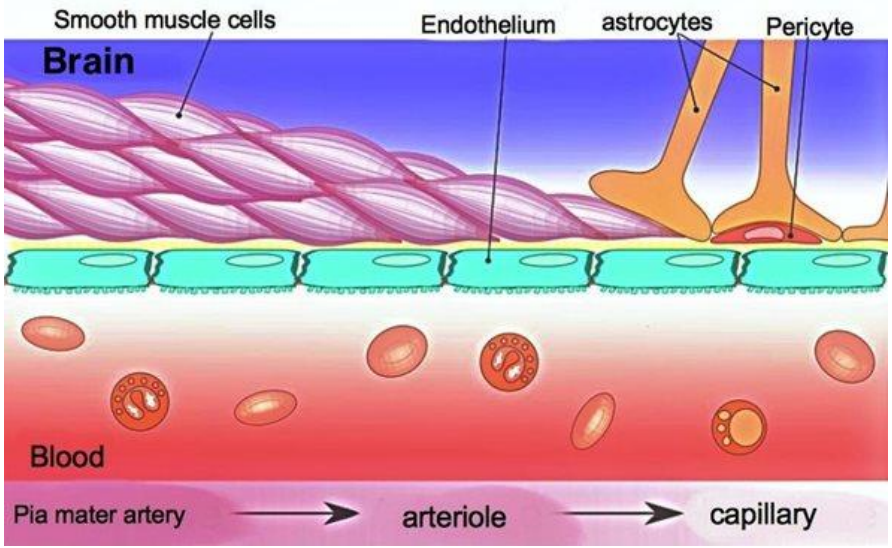
Goldman-Yassen, Lee, **Gombolay,** PedNeur 2024, PMID 38382244
Bou, Morris, Goldman-Yassen, Gombolay, *unpublished*

MOGAD and seizures in children

- 196 children (92 MOGAD, 83 MS, 21 AQP4-NMOSD)
- Seizures in: 30% of MOGAD versus 2% of MS and 5% of AQP4-NMOSD
- Leptomeningeal enhancement on brain MRI increased risk for seizures with an OR 7.2 (95% CI [1.9, 27.6], p = 0.004)

Phil Sumardi, *unpublished data*

Advanced MRI techniques to examine blood brain barrier injury

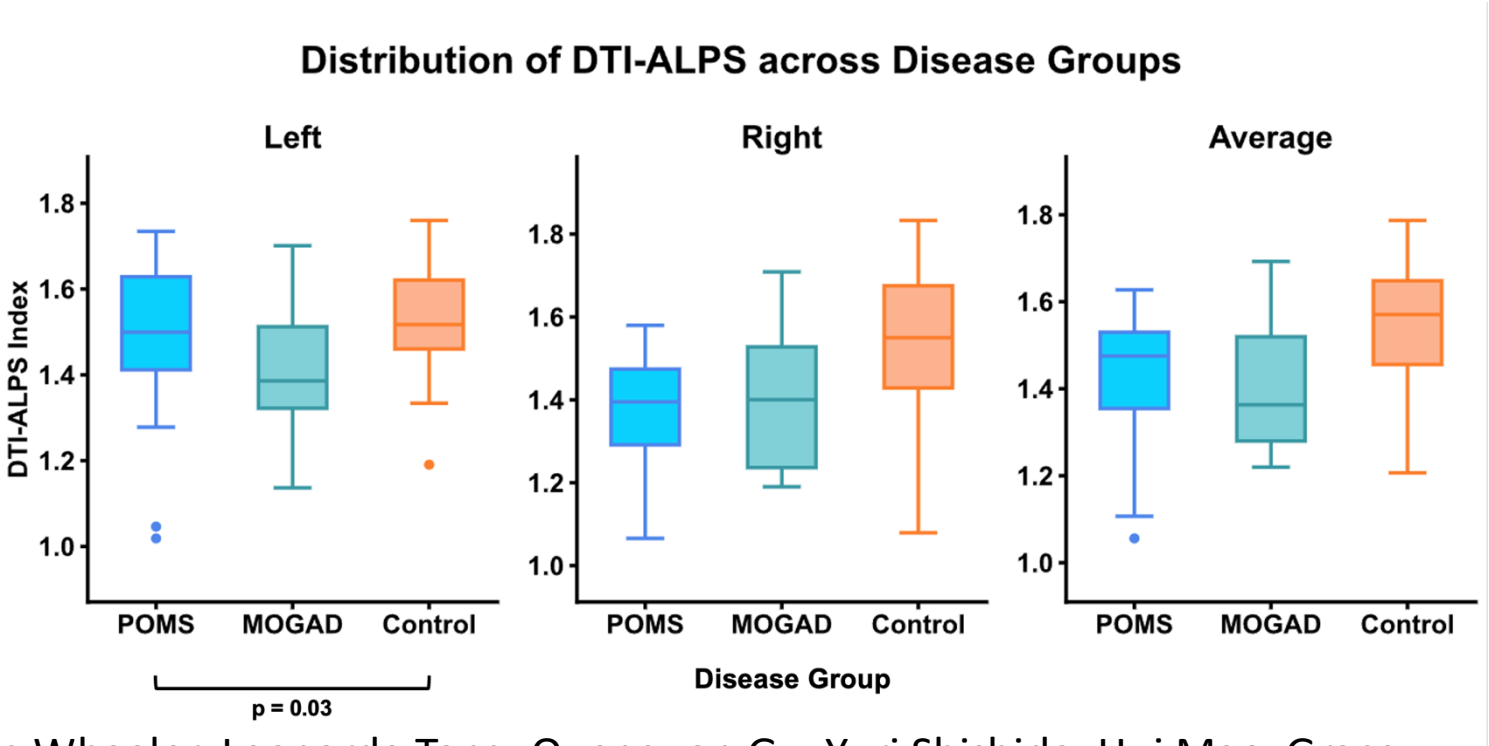


https://asm.org/articles/2020/april/how-pathogens-penetrate-the-blood-brain-barrier

Glymphatic system and MOGAD

- Glymphatic system is thought to be the “waste disposal” system for the brain
- DTI-ALPS (Diffusion Tensor Image Analysis ALong the Perivascular Space) is from MRI
- 27 children with MOGAD, 15 with POMS, 17 pediatric controls

DTI-ALPS changes in MOGAD



Austin Wheeler, Leonardo Tang, Quanquan Gu, Yuri Shishido, Hui Mao, Grace Gombolay, Adam Goldman-Yassen

Future work

- AI to help with earlier diagnosis of MOGAD and NMOSD vs MS
- International Treatment Consensus for MOGAD
- Predictive markers for treatment