

COGNITION IN AUTOIMMUNE ENCEPHALITIS - SUMMARY

PLAIN LANGUAGE SUMMARY

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BACKGROUND

- **Autoimmune Encephalitis** is a rare disease that affects different regions of the brain. Patients with this condition can have a variety of cognitive symptoms. For example, slow speed of information processing, attention lapses, word finding difficulties, trouble with following complex commands, difficulties in judgement, difficulties in comprehension of complex tasks, difficulties in forming new memories, and difficulties in understanding tasks or situations.
- These symptoms can change from one individual to another individual, and can fluctuate over the course of the illness. Also different types of autoimmune encephalitis can have differing presentation of the above symptoms.
- Historically (and to this day) clinicians and researchers have used a scale called the **modified Rankin Score** as a tool to monitor an individual's function i.e. how independently they can function in their day to day life.
- However, this scale does not affect the gravity of the individual's symptoms and does not provide in detail information about specific symptoms and complaints that the individual with autoimmune encephalitis might experience.

- Importantly, the scale does not measure behavioural, mood or cognitive outcomes in autoimmune encephalitis. Cognitive changes can be associated with long term disease related morbidity and can reduce quality of life.
- Therefore, we set out to gain a better understanding of the cognitive difficulties in autoimmune encephalitis.

WHAT DID WE DO?

- We gathered cognitive data from patients previously diagnosed with autoimmune encephalitis (retrospective data) from six hospitals in Victoria (Australia) to inform the analysis.
- Patients were identified retrospectively through medical records with a search for diagnosis of autoimmune encephalitis with a hospital admission between July 2008 and July 2019.
- Patients who met this criteria were screened to determine if they had participated in a neuropsychology assessment of their cognitive function i.e. memory, attention, language, judgement, planning, comprehension, and recall. We collected clinical data about each patient and also information of various clinical investigations i.e. lumbar puncture results and MRI.

WHAT WE FOUND

- The average age of patients at diagnosis was 49 years old and more than half showing as seropositive autoimmune encephalitis (meaning they had identifiable antibodies in their blood or their cerebrospinal fluid). Of the seropositive group:
 - nine patients had anti-NMDAR antibodies
 - nine anti-Leucine-rich glioma-inactivated one antibodies (LGI-1),
 - seven Voltage-gated potassium channel complex antibodies (unspecified) (VGKC)

- three glutamic acid decarboxylase 65- (GAD65) one α -amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid receptor antibodies (AMPA)
- one γ -aminobutyric acid B antibodies (GABA-Band)
- one collapsing response mediator protein 5 antibodies (CRMP5).
- 42% of patients had impairments on executive function tests e.g. a set of tasks that includes working memory, planning, flexible thinking, and ability to remember multiple instructions, and capacity for self-regulation and ordering or prioritizing of tasks.
- The next most common impairment was on memory tests e.g. the mental processes involved in acquiring, retaining and recalling information; 40.7% of patient.
- For the first-time, we found 29 patterns of cognition among patients with autoimmune encephalitis in our analysis. The four most common patterns of cognition were:
 - Intact cognition (no cognitive deficits elicited)
 - Isolated memory deficits
 - Executive dysfunction with memory impairment (combination pattern)
 - Isolated visuospatial/visuoconstructional impairments (referring to visual or spatial perception of objects).
- But, concluding that there are 29 patterns means that cognitive outcomes in patients with autoimmune encephalitis are complex and need further detailed investigation.

WHAT DO THE FINDINGS MEAN?

- Our research highlighted that more detailed and systematic analysis of memory and executive function profiles in patients with autoimmune encephalitis is required.

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- Impairments in memory and executive dysfunction can have huge implications for the patient and their caregivers, and tools that would better characterise and follow these symptoms in autoimmune encephalitis are needed.
- Understanding memory and executive function impairment in autoimmune encephalitis can help us in devising strategies that would assist patients with day to day function, but also monitor disease trajectory over time and delineate patient's response to treatment.
- We could not predict good cognitive outcome (e.g. having 'intact' cognition after autoimmune encephalitis) in patients. We recommend clinicians provide ongoing comprehensive cognitive monitoring in patients with autoimmune encephalitis, and reactive intervention when required.
- An individualised approach will assist in the management the long-term morbidity of this disease, to minimise the effect on the individual's quality of life and any damaging psychological outcomes.

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We are a member of the Monash Central Clinical School [Community and Research Engagement \(CaRE\) Program](#).



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