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BACKGROUND

- Dementia has many underlying aetiologies that can be difficult to distinguish, particularly in early disease or when the clinical presentation is atypical.
- Timely, biomarker-based diagnosis of Alzheimer's disease (AD) is therefore essential to improve diagnostic accuracy and inform clinical management decisions.
- Cerebrospinal fluid (CSF) biomarkers of amyloid- β (A β) and tau pathology are well-established indicators of AD pathophysiology.
- Automated, standardised platforms such as the Roche Elecsys[®] immunoassay system enable reliable and scalable CSF AD biomarker testing in clinical practice.
- We report our experience establishing a clinical CSF AD biomarker service at the National Neuroscience Institute (NNI), Singapore.

METHODS

- A CSF biomarker service was established in the NNI Neuroscience Clinical Laboratory (NCL) using the Roche Elecsys[®] e411 platform since February 2024.
- CSF samples were collected and stored in the labs at public and private healthcare institutes before transportation to NNI for further testing as illustrated in figure 1.
- CSF A β 42, phosphorylated tau (p-tau181) and total tau (t-tau) were measured using electrochemiluminescence assays.
- Patient demographics, referral sources and biomarker result profiles were collected and biomarker profiles were classified according to established cut-offs using the p-tau181/ A β 42 ratio with a ratio of >0.023 showing a positive result.



Figure 1

RESULTS

A total of 185 CSF samples were collected from February 2024 to May 2026.

Table 1: Overall demographics (n= 185)

Gender	• Male: 84 (45.4%) • Females: 101 (54.6%)
Mean Age	67.14 (SD = 8.92) years
Referral source	• Public Institute (internal): 90 (48.6%) • Public Institute (external): 79 (42.7%) • Private Institute: 16 (8.6%)
Biomarker results*	• Positive (elevated ratio): 88 (47.6%) • Negative (normal ratio): 97 (52.4%)

*Positive result: p-tau181/ A β 42 ratio >0.023

Table 2: Demographics of patients with positive biomarker result (n= 88)

Gender	• Male: 32 (36.4%) • Females: 56 (63.6%)
Mean Age	66.90 (SD = 8.60) years
Average p-tau181/ A β 42 ratio	0.052

- Out of the patients with a positive biomarker result, 36 (40.9%) showed reduced A β 42 levels with a normal pTau level, which may be suggestive of early pathological changes associated with AD.
- The results show that there is a female predominance in the positive biomarker result group, which is also reflective of the disease which commonly affects women more than men.

CONCLUSION

- CSF biomarker analysis can provide clinicians with useful additional information to guide diagnosis and management.
- By providing a hub-and-spoke model, our service supports a wider adoption of biomarker-guided AD diagnostics in routine clinical care within Singapore.
- For subsequent analysis, it will be useful to study the correlation of the biomarker results to the initial and eventual clinical diagnosis of the patient to allow us to further analyze the utility of this biomarker service.

References and acknowledgement:

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