

Background

- Seizures and Alzheimer's disease and related dementias (ADRD) share a bidirectional relationship, (Tan et al., 2024) and seizure activity may accelerate cognitive decline.
- Vascular pathology may contribute to seizure risk in older adults, with cerebrovascular disease linked to increased cortical excitability (Gugger et al., 2024).
- However, vascular risk factors for seizures in memory clinic populations remain poorly characterized.

Objectives:

- Determine seizure prevalence.
- Briefly examine functional impact of seizures through executive function and IADL assessment.
- Identify predictors of abnormal EEG.
- Identify predictors of seizure diagnosis.

Methods

Sample

- 340 patients evaluated in a memory clinic between December 2020 and May 2021 and followed over a 5-year interval.
 - Sex: 164 male, 184 female
 - Mean age: 77.7 years
 - Mean education: 15.4 years

Measures

- Trail Making Test – B; Mini Mental Status Exam – 2nd edition; Lawton Instrumental Activities of Daily Living (IADL); Geriatric Depression Scale (GDS); Generalized Anxiety Disorder (GAD-7)
- Neuroimaging (MRI, CT*); EEG report

Analyses

- Logistic regression examined predictors of abnormal EEG, clinical neuroimaging findings per radiology report, and seizure diagnosis
- Linear regression examined executive functioning and IADL outcomes.

Results

Seizure prevalence and Clinical Characteristics

		N	%
Neurocognitive Disorder (NCD)	No NCD	32	9.4%
	Mild NCD	159	46.8%
	Major NCD	149	17.0%
Clinical Etiology	None	58	17.0%
	AD	97	28.5%
	FTD	9	2.6%
	LBD	6	1.8%
	Vascular	169	49.7%
EEG Referral	No EEG	285	83.6%
	EEG	55	16.2%
EEG Result	Normal	22	34.5%
	Abnormal	33	65.5%
Seizure Diagnosis	Negative	39	70.9%
	Positive	16	4.7%

Key findings

EEG referral
55/340 (16%)

Abnormal EEG
34/55 (62%)

Seizure diagnosis
16/340 (4.7%)

Functional Impact

	β	p
Lawton IADL	-0.15	.016

Seizures (mean) 5.20 (2.573)
No Seizures (mean) 3.31 (2.358)

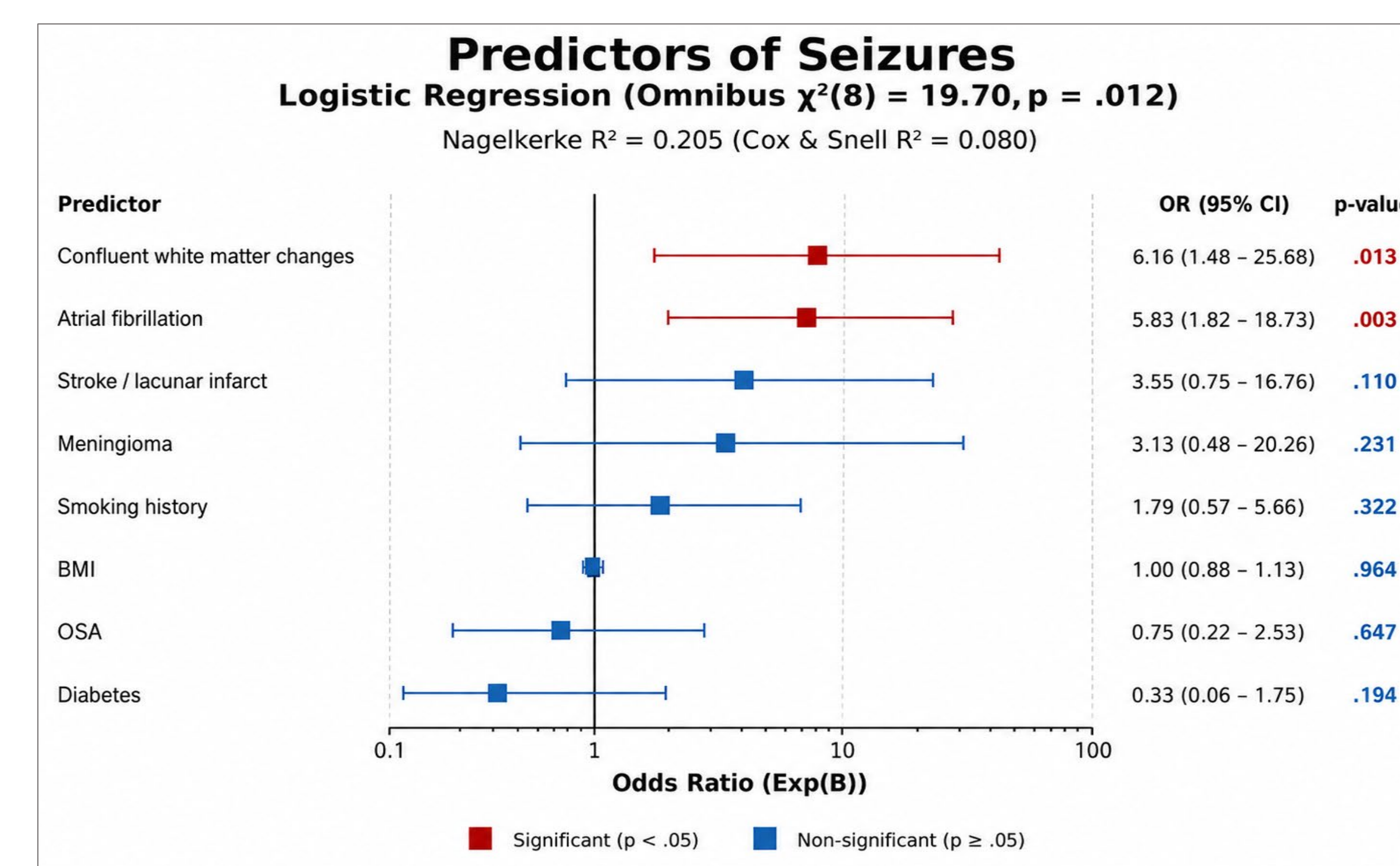
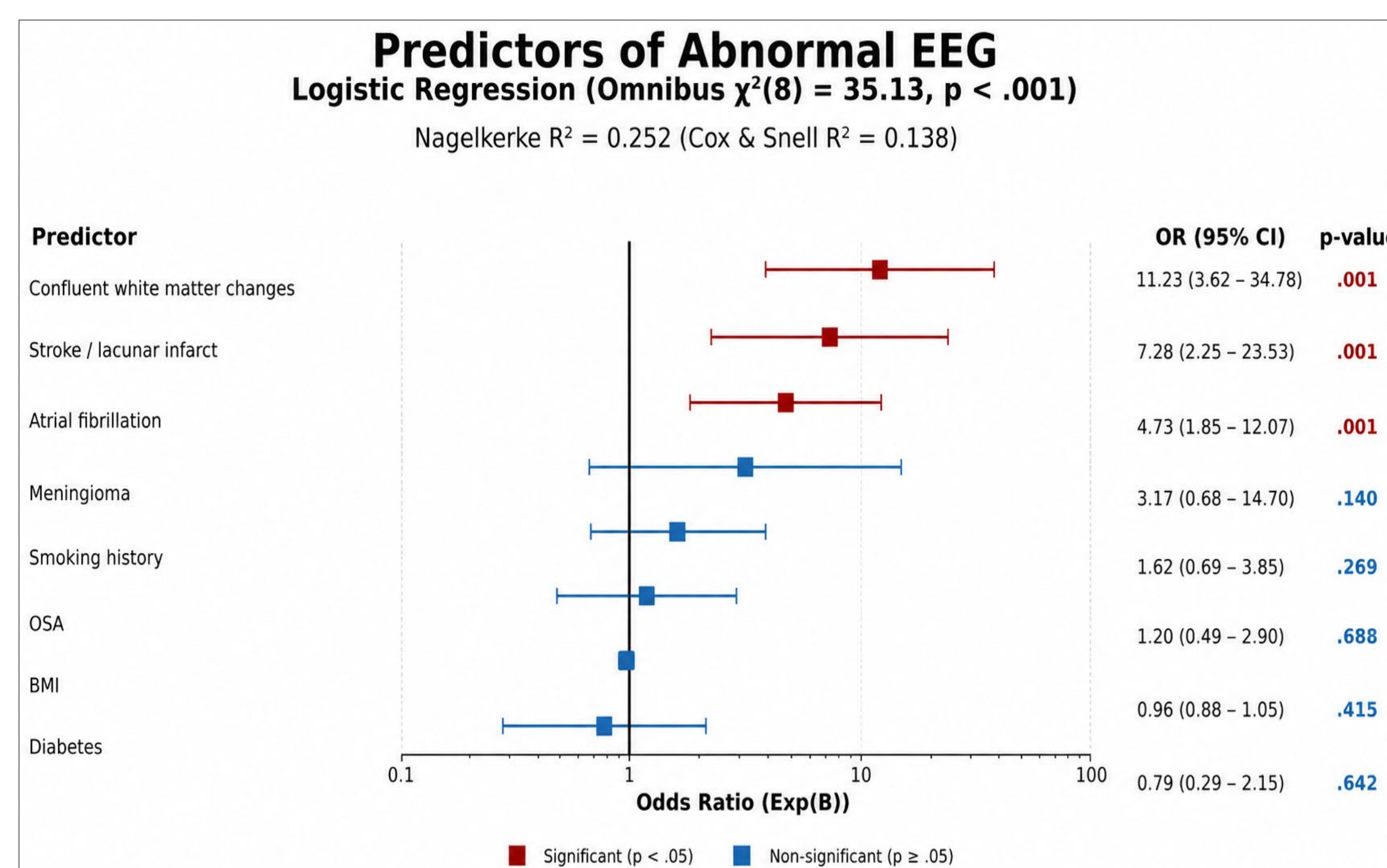
	β	p
Trail Making Test - B	0.12	.029

Seizures 248.13(89.337sec)
No Seizures 193.68 (95.357sec)

Key findings

Adjusting for age, MMSE, and mood, **seizure diagnosis** predicted
 ↑ IADL impairment
 ↑ Executive dysfunction

Predictors of Abnormal EEG and Seizure Diagnosis



Discussion

Prevalence

- Seizures were 2-4 times more prevalent in this memory clinic sample compared to general (1.2%) and older adult (2.5%) populations.
- All patients with seizures and 94% with abnormal EEGs met NCD criteria, typically major NCD with a vascular etiology.

Risk Factors

- Confluent white matter changes emerged as the strongest imaging predictor of abnormal EEG findings and seizure diagnosis.
- Stroke and lacunar infarcts were not significantly associated with increased odds of seizure diagnosis.
- Atrial fibrillation was the only clinical vascular risk factor associated with both outcomes.

IADL & Cognition

- Seizure diagnosis was associated with slower executive functioning and functional declines (↑ IADL dependence).
- These findings support the bidirectional relationship between seizures & ADRD.

References

