

The supporting role of visual evoked potentials for the diagnosis of optic neuritis within the 2022 ICON criteria

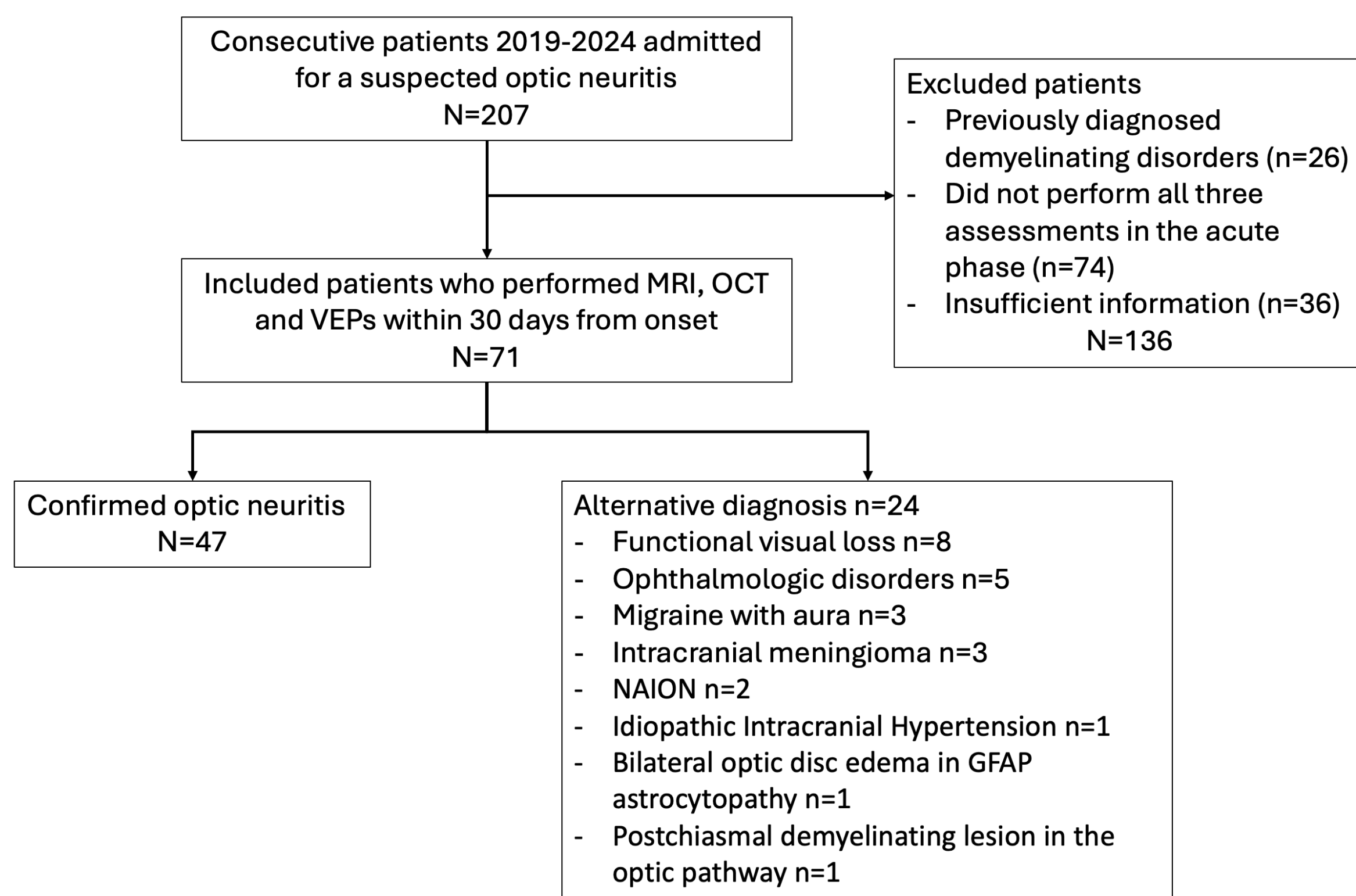
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Introduction

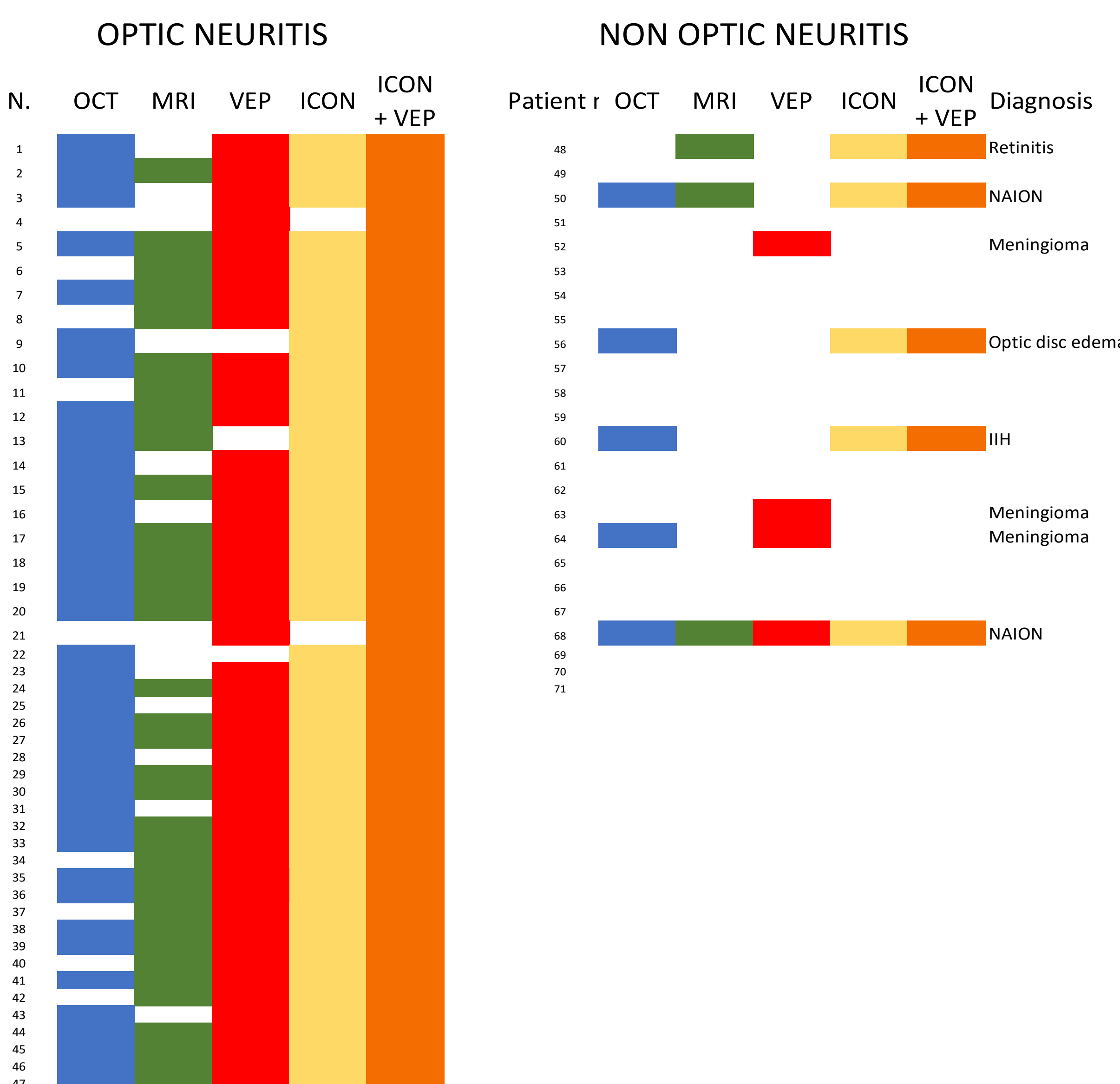
- Optic neuritis (ON) is a key feature of CNS demyelinating disorders like MS, MOGAD, and NMOSD.
- Early and accurate diagnosis is essential but challenging—misdiagnosis rates reach **60%**.
- **ICON 2022 criteria** define ON using clinical signs + paraclinical tests (MRI, OCT, antibodies), but **do not include Visual Evoked Potentials (VEPs)**.
- We aimed to assess the diagnostic performance of VEPs in the workup of a suspected ON within the ICON criteria

Methods

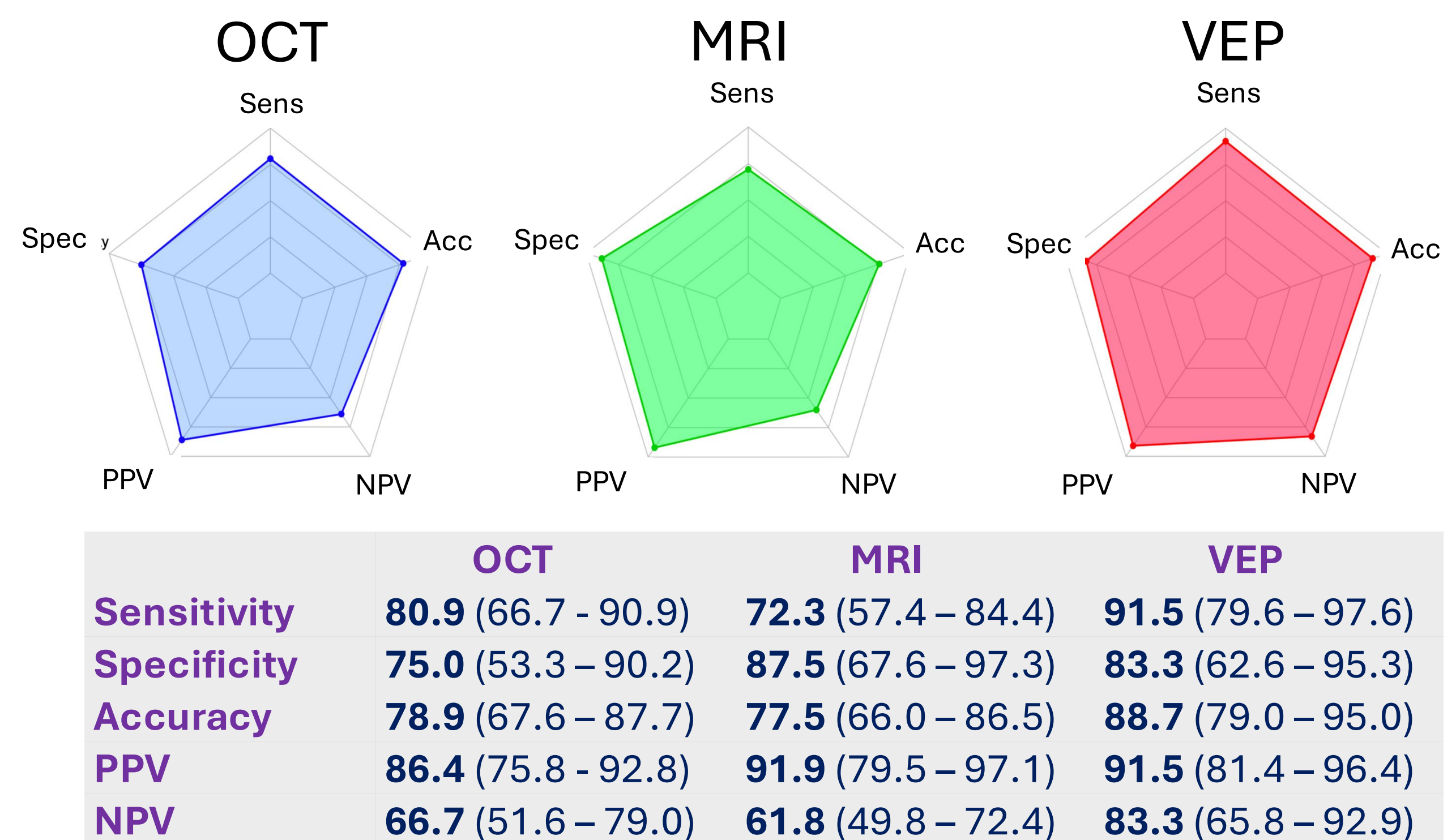


Design: Retrospective cohort, 71 patients with suspected ON.
Tests: OCT, MRI, VEPs, within 30 days from onset.
Diagnosis: Expert-confirmed ON vs alternative causes.
Analysis: Sensitivity, specificity, accuracy, AUC from ROC curves.

Results

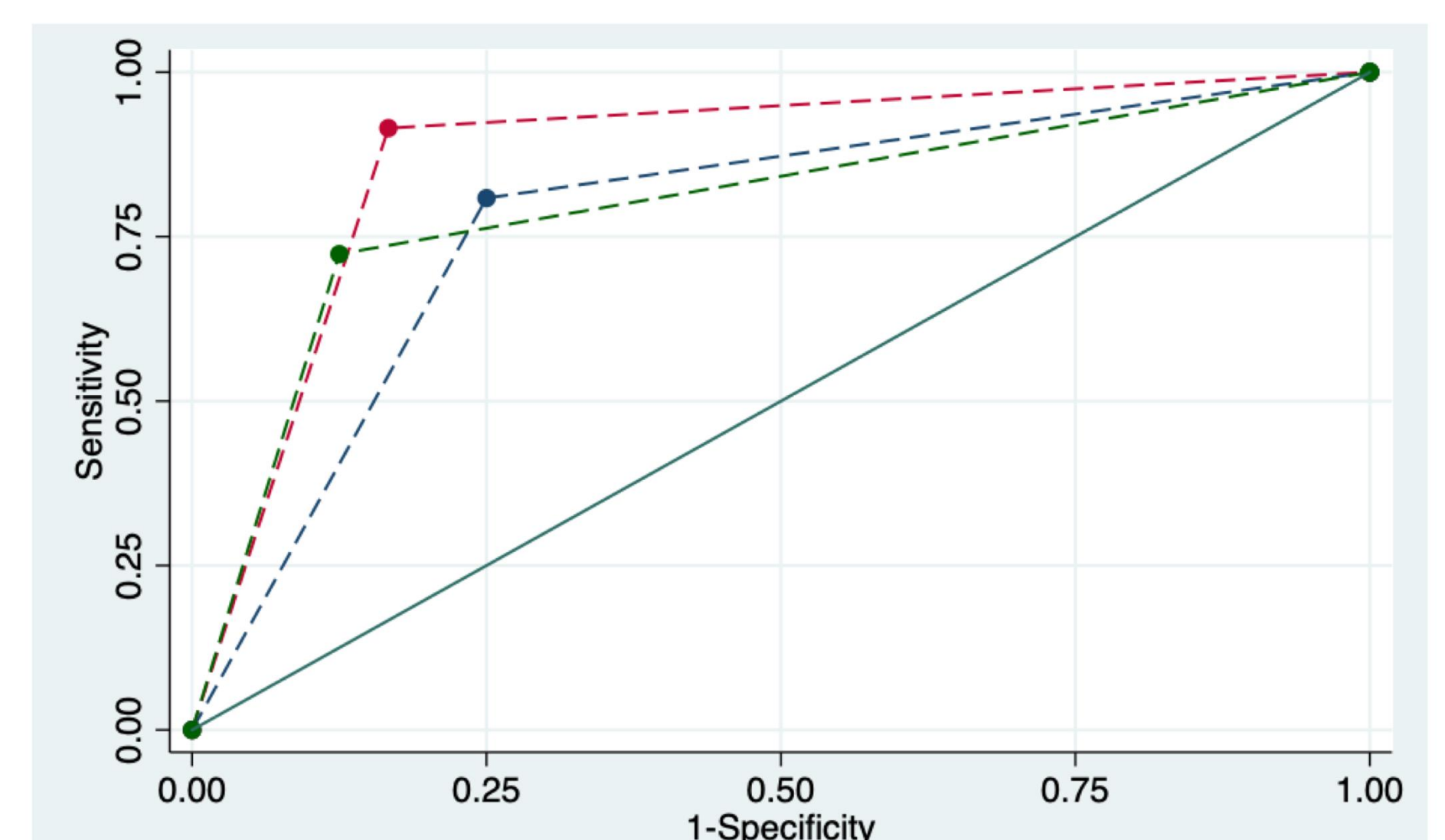


Total cohort n = 71
 • ON confirmed: 47
 • Alternative diagnoses: 24
 Mean age: **36.3 years**, **75% female**
 ON types: **MS-ON (36)**, **MOGAD-ON (6)**, **isolated ON (4)**, **NMOSD-ON (1)**



VEPs had the highest sensitivity (91.5%) and accuracy (88.7%) among all paraclinical tests.

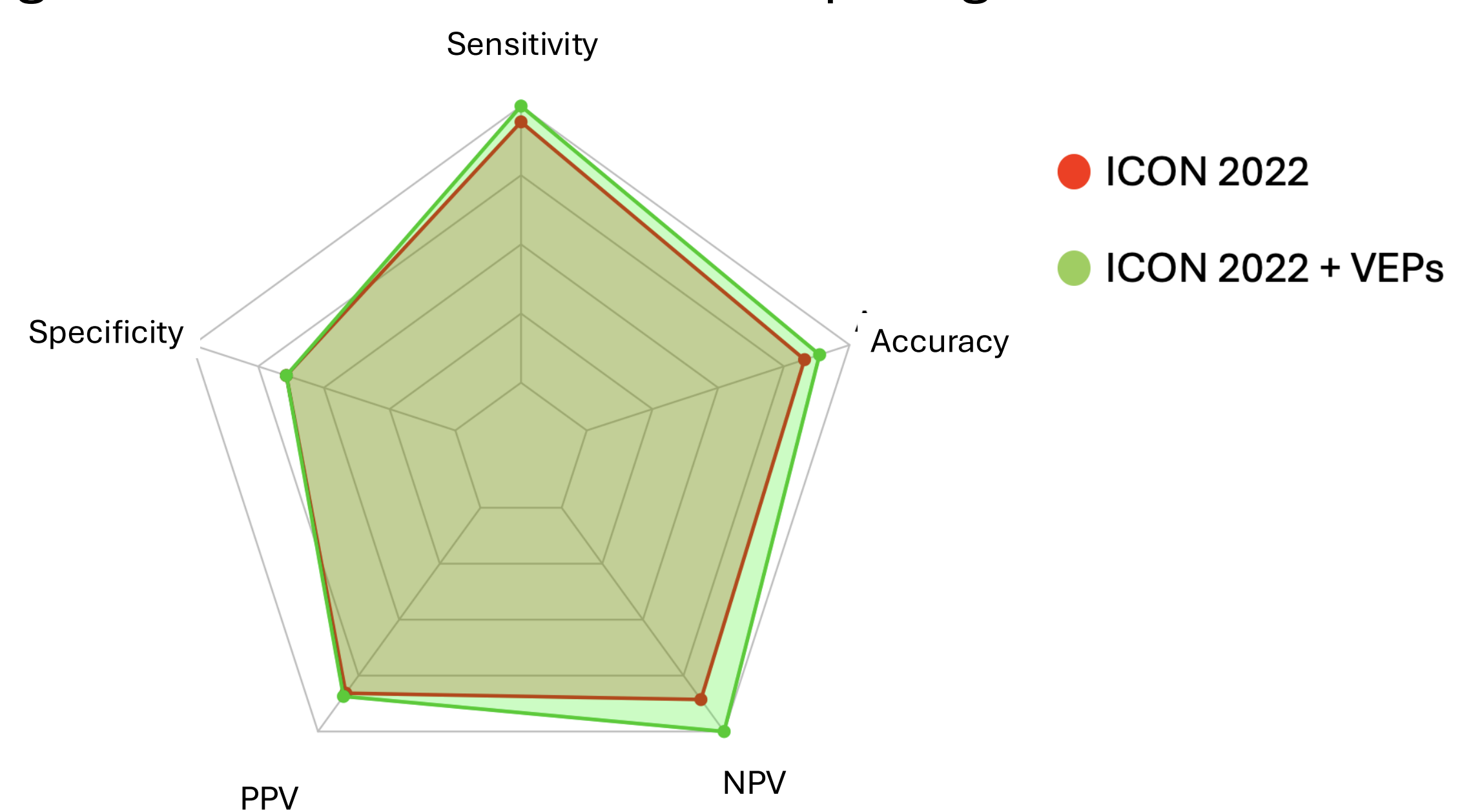
VEPs also had a specificity of 83.3%, higher than OCT (75%) but lower than MRI (87.5%).



	OCT	MRI	VEP
AUC	0.78 (0.67 - 0.88)	0.80 (0.71 - 0.89)	0.87 (0.82 - 0.97)

VEPs had the highest AUC (0.87), followed by MRI (0.80) and OCT (0.78)

No significant difference when comparing ROC curves



	ICON 2022	ICON 2022 + VEPs
Sensitivity	95.7 (85.5 - 99.5)	100.0 (92.5 - 100)
Specificity	75.0 (53.3 - 90.2)	75.0 (53.3 - 90.2)
Accuracy	88.7 (79.0 - 95.0)	91.5 (82.5 - 96.8)
PPV	88.2 (78.9 - 93.7)	88.7 (79.7 - 94.0)
NPV	90.0 (69.5 - 97.3)	100.0 (78.2 - 100.0)

The addition of VEPs led to an improvement in **sensitivity** (100.0%, CI: 92.5 - 100.0) and **NPV** (100%, CI: 78.2 - 100.0) which resulted in an improvement in diagnostic **accuracy** to 91.5% (CI: 82.5 - 96.8).

There was **no specificity loss**.

Discussion and conclusions

VEPs had a **comparable diagnostic performance** to other paraclinical tests.

Specific VEP markers like **P100 latency delay** and **inter-eye asymmetry** are robust indicators of ON.

This study supports inclusion of VEPs in updated ICON criteria and alignment with future **2024 McDonald MS criteria**.

