

Improving Dementia Diagnostics in a Norwegian Memory Clinic Cohort using Artificial Intelligence - the AIDDEM study

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BACKGROUND

- Dementia diagnosis is time-consuming and challenging, leaving many cases undetected.
- AI-based clinical decision support systems may help address these diagnostic challenges.

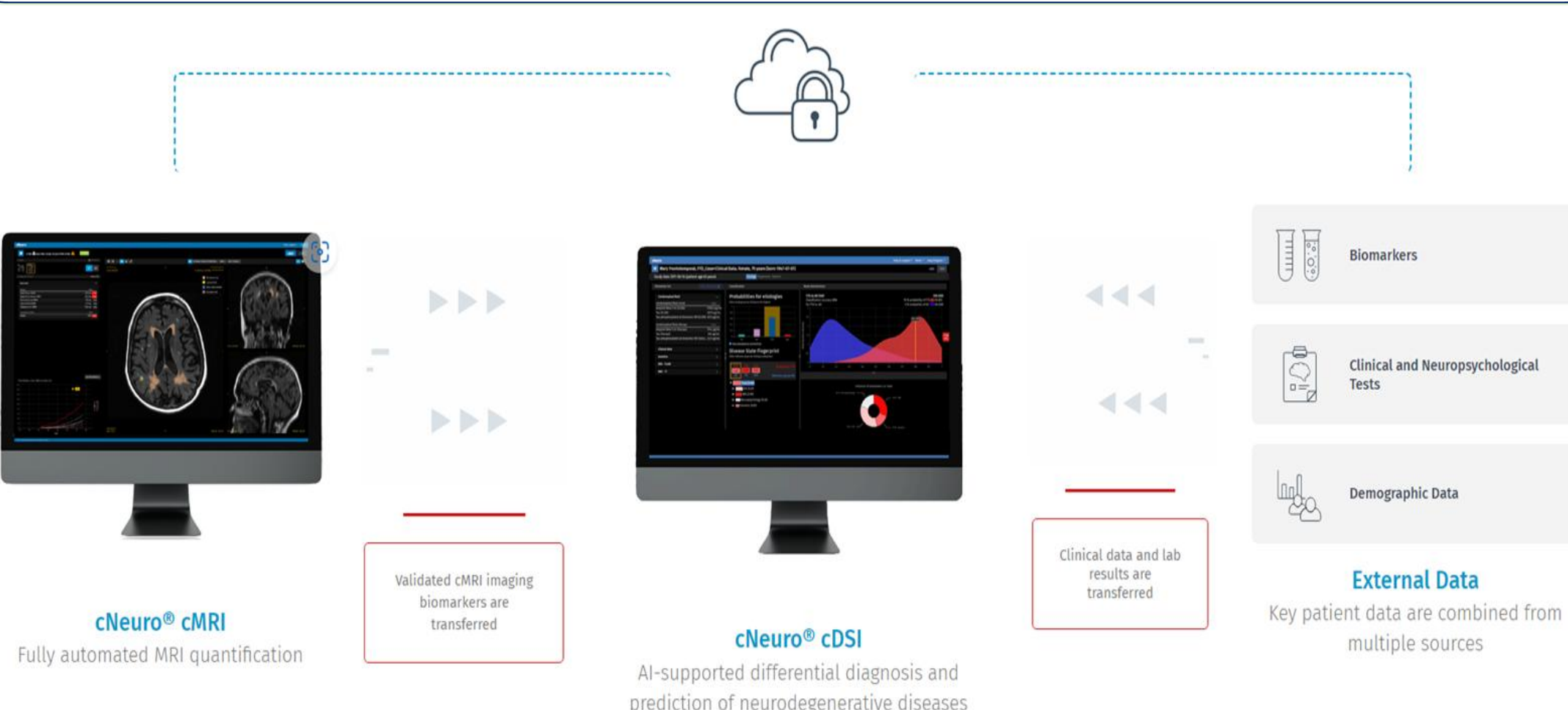
AIM

To enhance the diagnostic accuracy of dementia by validating a clinically feasible AI-based digital tool, cNeuro®, in real world data.

METHODS

- 547 memory clinic patients from the Norwegian Registry of Persons Assessed for Cognitive Symptoms (NorCog) and 94 cognitively healthy controls from the CogNorm study.
- Data analysis with automatic MRI quantification tool, cMRI®
- Preparing for further analysis with cNeuro (Fig 1) combining these MRI biomarkers with demographic data, CSF biomarkers and neuropsychological test data for clinical decision support.

Figure 1. The cNeuro® AI tool



RESULTS

Compared with cognitively healthy controls, all dementia groups show lower MMSE scores and higher automatic computed measures of medial temporal (MTA) (Fig 2) and global cortical atrophy (GCA) (Fig 3), with Fazekas scores particularly elevated in VaD.

The anterior-posterior atrophy index (APS) is most negative in FTD (Fig 4), indicating more anterior-predominant atrophy

The AD similarity score is highest in AD and intermediate in the other dementia groups (fig 5).

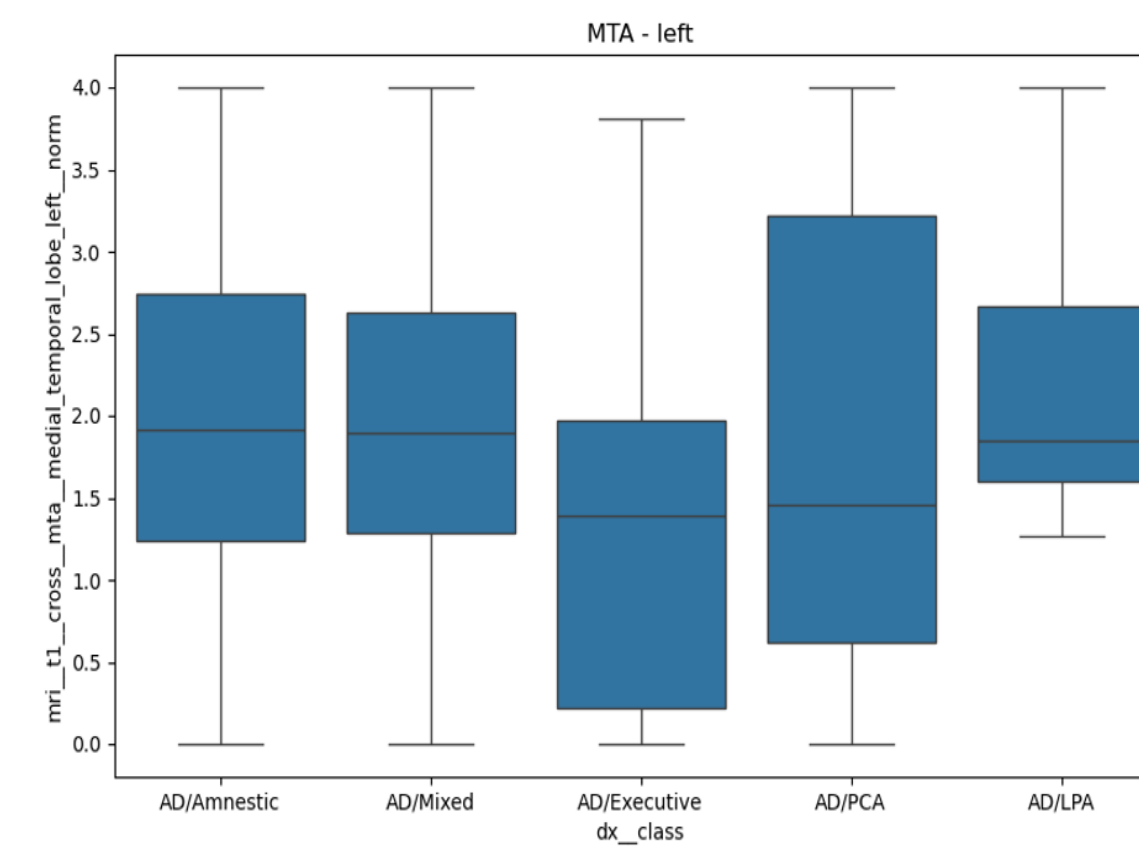


Figure 2.

Normalized left medial temporal atrophy (MTA) scores across AD subgroups. AD/Executive and AD/PKA show the lowest median MTA (least atrophy), whereas AD/Amnesic, AD/LPA and AD/Mixed have similarly higher medians, indicating more pronounced medial temporal atrophy

RESULTS

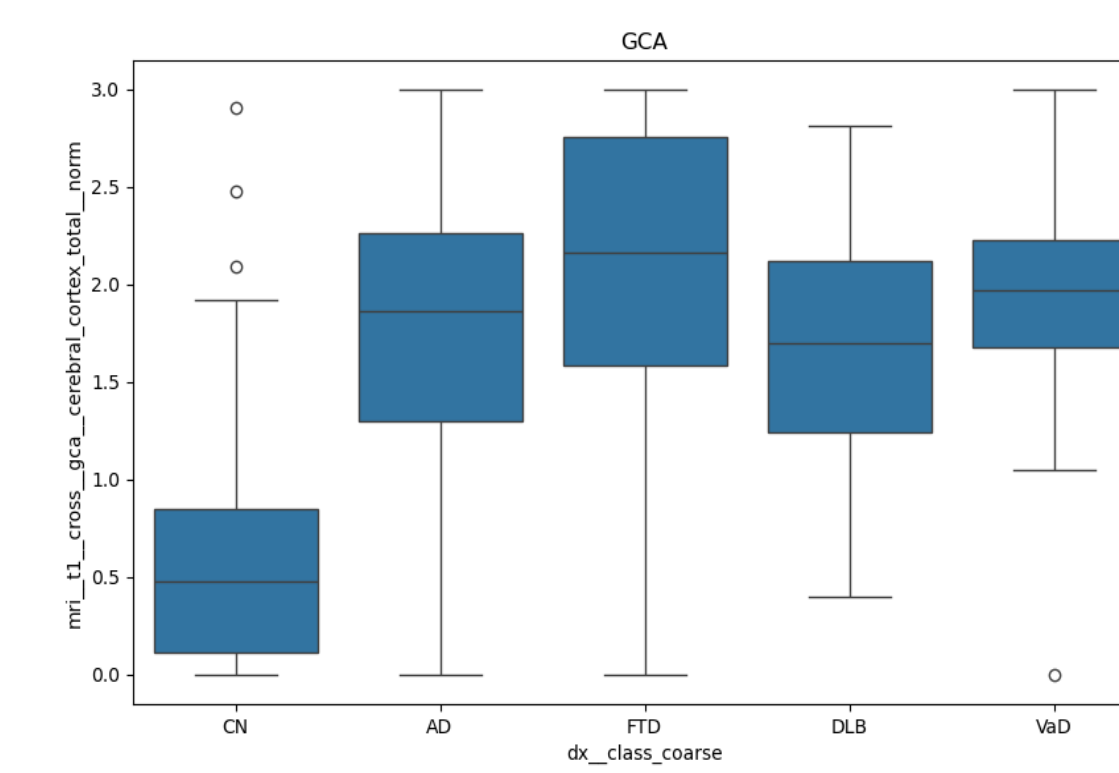


Figure 3.

Normalized global cortical atrophy (GCA) scores across diagnostic groups. Cognitively healthy controls show the lowest GCA (least atrophy), whereas all dementia groups (AD, DLB, FTD, VaD) have higher scores. Median GCA is highest in FTD and VaD, followed by AD, with DLB lower but still clearly elevated compared with controls.

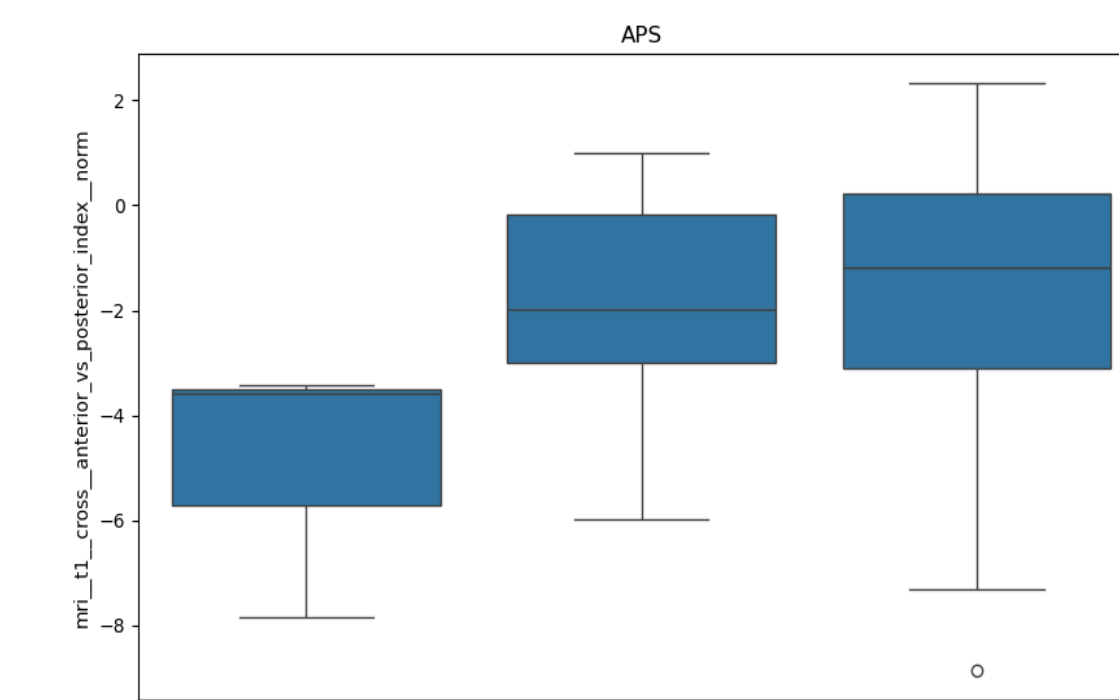


Figure 4.

Normalized anterior-posterior atrophy index (APS) across FTD subgroups. FTD/motor neuron disease shows the lowest (most negative) index values, FTD/PPA has intermediate values, and FTD/bvFTD shows the highest (least negative to positive) values, indicating a relative shift toward more anterior-predominant atrophy in bvFTD

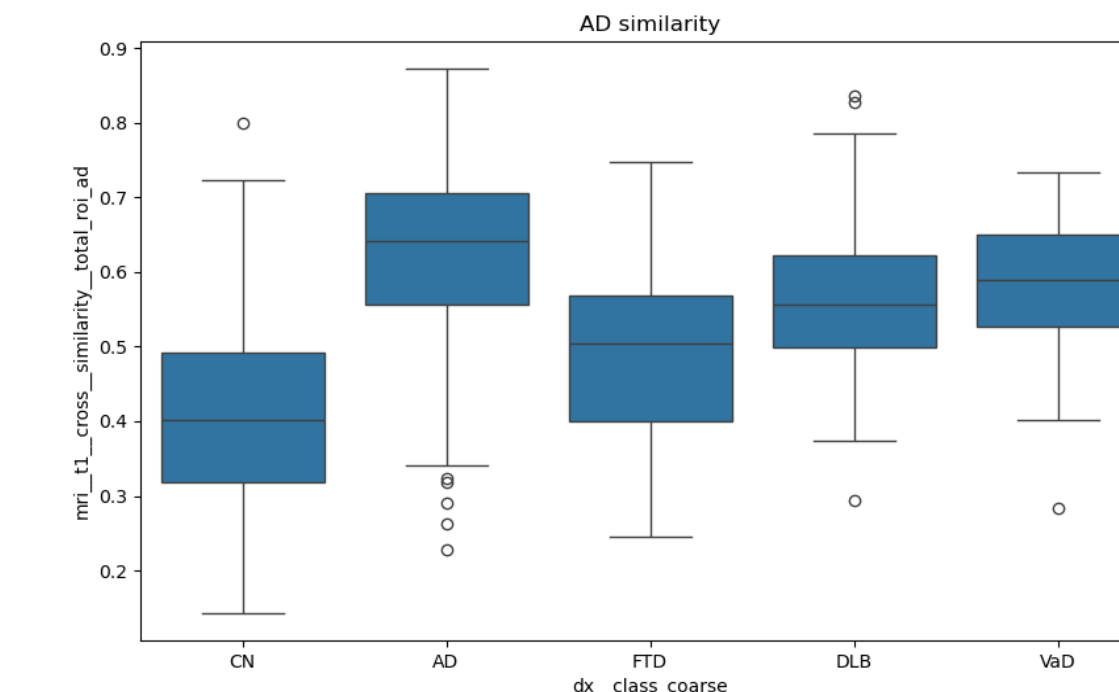


Figure 5.

AD- similarity pattern across diagnostic groups. Median AD similarity is lowest in cognitively healthy controls, highest in AD and intermediate in the other dementia groups.

CONCLUSION

- The AI-based quantification tool, cMRI, produced robust, automated MRI markers that reliably distinguished cognitively healthy controls from major dementia types (AD, FTD, DLB, VaD).
- These findings support the integration of AI-driven tools into routine dementia workups to enhance diagnostic precision, thereby enabling earlier and more appropriate therapeutic decision-making.



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