IDENTIFYING PARKINSONISM IN MILD-COGNITIVE IMPAIRMENT

Fernando R, Thomas AJ , Hamilton C, Durcan R, Lawley S, Barker S, Ciafone J, Barnett N, Olsen K, Firbank M, Roberts G, Lloyd J, Petrides G, Colloby S, Allan LM, McKeith IG, O'Brien JT, Taylor JP and Donaghy PC

Newcastle University Medicine Malaysia

INTRODUCTION

Dementia with Lewy bodies (DLB) is the second most common form of neurodegenerative dementia. The presence of parkinsonism is one of four core clinical feature for the diagnosis of DLB and mild cognitive impairment with Lewy bodies (MCI-LB). The clinical diagnosis of MCI-LB is challenging as symptoms are less frequent and less severe at this early disease stage.

This study aims to determine whether a five-item scale derived from the Unified Parkinsonism Disease Rating Scale (UPDRS) by Ballard[1] for parkinsonism in dementia stages is also effective in identifying parkinsonism in the MCI stages.

METHOD

146 participants with MCI from two independent research cohorts in the North-East of England were selected[2,3] and were classified into two groups:

1. those with parkinsonism(P+) and an abnormal striatal dopaminergic output(D+) =P+D+
2. those without parkinsonism(P-) and a normal dopaminergic output(D-) =P-D-

Any people with P+D-, or P-D+ were excluded as neither of them fits the description of true motor parkinsonism (clinician consensus & an abnormal scan

The discriminant ability of Ballard's five-feature scale, was then analyzed to differentiate between participants who were P+D+ and those who were P-D-.

RESULTS

The Ballard scale demonstrated a high discriminant ability in identifying parkinsonism in individuals with MCI.

In the first cohort, the scale had an Area Under the Receiver Operating Characteristic (AUROC) of 0.92, indicating a high level of accuracy.

In the second cohort, the scale performed even better, with an AUROC of 0.97, where an AUROC of 1 indicates perfect discernability and an AUROC of 0.5 indicates random chance.

A cut-off point of 3.5, derived from the first cohort, showed a sensitivity of 83% and a specificity of 88% for the first cohort, and a sensitivity of 100% and a specificity of 82% in the second cohort.

DISCUSSION

These findings demonstrate that the Ballard scale can identify the presence of parkinsonism in MCI, however the signs are much milder in MCI, therefore a lower threshold is necessary at this stage.

The identification of early clinical parkinsonism is challenging because mild motor signs suggestive of parkinsonism are present in 46% of older adults, and the prevalence increases with age.

Things for clinicians to consider are that: firstly as their parkinsonism is mild, only few patients reached the 7.5 threshold described by Ballard et al.; Secondly, patients without parkinsonism can also have high scores on the UPDRS.

The five features are not intended to replace clinical judgement, but can be used to help in identifying parkinsonism in people with MCI in the clinic. In addition to the cardinal features of parkinsonism, features of reduced facial expression and intention tremor should be considered by clinicians.

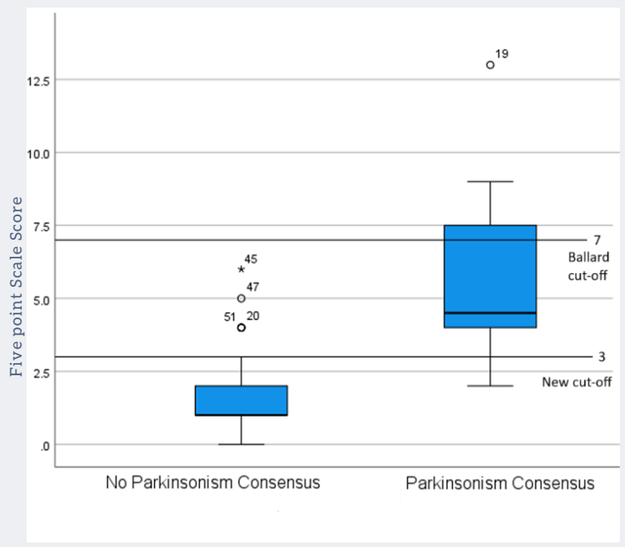

Figure 1.
The following diagram for the 1st cohort shows that the old cut-off of 7 from Ballard et al. doesn't pick up most of the Parkinsonism cases in MCI

Conclusion

In conclusion, clinicians and researchers should be aware that parkinsonian signs are mild in MCI-LB. A five-feature scale developed for dementia is also effective in identifying parkinsonism in MCI, but a lower threshold for classification must be used in MCI.

References

[1] Ballard, C. et al. The UPDRS scale as a means of identifying extrapyramidal signs in patients suffering from dementia with Lewy bodies. Acta Neurol Scand 96, 366–71 (1997).
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[3] Donaghy, P. C. et al. Mild cognitive impairment with Lewy bodies: neuropsychiatric supportive symptoms and cognitive profile. Psychol Med 52, 1147–1155 (2022).