



The University of
Nottingham

UNITED KINGDOM · CHINA · MALAYSIA

de Spiegeleer, Anton and Masud, Tahir and Greenhaff, Paul L. and Van den Noortgate, Nele and Petrovic, Mirko and Hood, Victoria L. and Gladman, John R.F. and van der Wardt, Veronika and Harwood, Rowan H. and Booth, Victoria (2014) P242: Prediction of falls risk with six different biomarkers in mild cognitive impairment using principal component analysis. *European Geriatric Medicine*, 5 (S1). S161. ISSN 1878-7657

Access from the University of Nottingham repository:

<http://eprints.nottingham.ac.uk/43955/1/abstract%20EUGMS%20Anton%20Spiegeleer%20AAM.pdf>

Copyright and reuse:

The Nottingham ePrints service makes this work by researchers of the University of Nottingham available open access under the following conditions.

This article is made available under the Creative Commons Attribution Non-commercial No Derivatives licence and may be reused according to the conditions of the licence. For more details see: <http://creativecommons.org/licenses/by-nc-nd/2.5/>

A note on versions:

The version presented here may differ from the published version or from the version of record. If you wish to cite this item you are advised to consult the publisher's version. Please see the repository url above for details on accessing the published version and note that access may require a subscription.

For more information, please contact eprints@nottingham.ac.uk

Prediction of Falls Risk with Six Different Biomarkers in Mild Cognitive Impairment Using Principal Component Analysis

Anton De Spiegeleer^{1,2}, Tahir Masud³, Paul Greenhaff⁴, Nele Van Den Noortgate², Mirko Petrovic², Victoria Hood⁴, John Gladman⁵, Veronika van der Wardt⁵, Rowan Harwood³, Victoria Booth^{3,5}

¹MRC/Arthritis Research UK Centre for Musculoskeletal Ageing Research, School of Biomedical Sciences, University of Nottingham, Nottingham, UK

²Department of Internal Medicine, Faculty of Medicine and Health Sciences, Ghent University, Ghent, Belgium

³Department of Health care for Older People, Nottingham University Hospitals NHS Trust, Nottingham, UK

⁴School of Health Sciences, University of Nottingham, Nottingham, UK

⁵Division of Rehabilitation and Ageing, University of Nottingham, Nottingham, UK

Introduction

Falls in older people cause much morbidity and societal cost. Early dementia (ED) is a neglected population in falls research, despite mild cognitive impairment (MCI) being a recognised risk factor. As part of ongoing research into falls in ED we compared different physical/cognitive biomarkers as falls predictors, and investigated if they gave independent information.

Methods

We recruited cross-sectionally, 50 older community-dwellers with ED or MCI [MMSE=19-26 or MoCA=13-25] and classified them, using Principal Component Analysis (PCA), into clusters, based upon similarity on 6 physiological/cognitive tests: *Montreal Cognitive Assessment (MoCA)*, *gait speed (GS)*, *Timed Up and Go (TUG)*, *Berg Balance score (BBS)*, *Falls Efficacy Scale International (FES-I)* and *Physiological Profile Assessment (PPA)*.

Results

Complete data was available for 44 participants (mean age=81, range=67-93 years; 21 women). *GS*, *TUG*, *BBS* and *FES-I* gave similar information and were therefore reduced to one Principal Component; while *MoCA* and *PPA* were reduced to another Principal Component (*table 1*). *Figure 1* shows the participants plotted for both Principal Components. Participants were classified into 2 clusters of similar characteristics, which correlated with a history of falls (last 6 months).

Conclusion

These data suggest that to characterize falls risk in older people with ED/MCI, it may be sufficient to choose two tests: one from Principal Component-1 (*GS*, *TUG*, *BBS*, *FES-I*) and another from Principal Component-2 (*MoCA*, *PPA*). Thus a minimum set of biomarkers could predict falls, allowing targeting of falls prevention to those at the highest risk. Larger longitudinal studies are now required to confirm these findings.

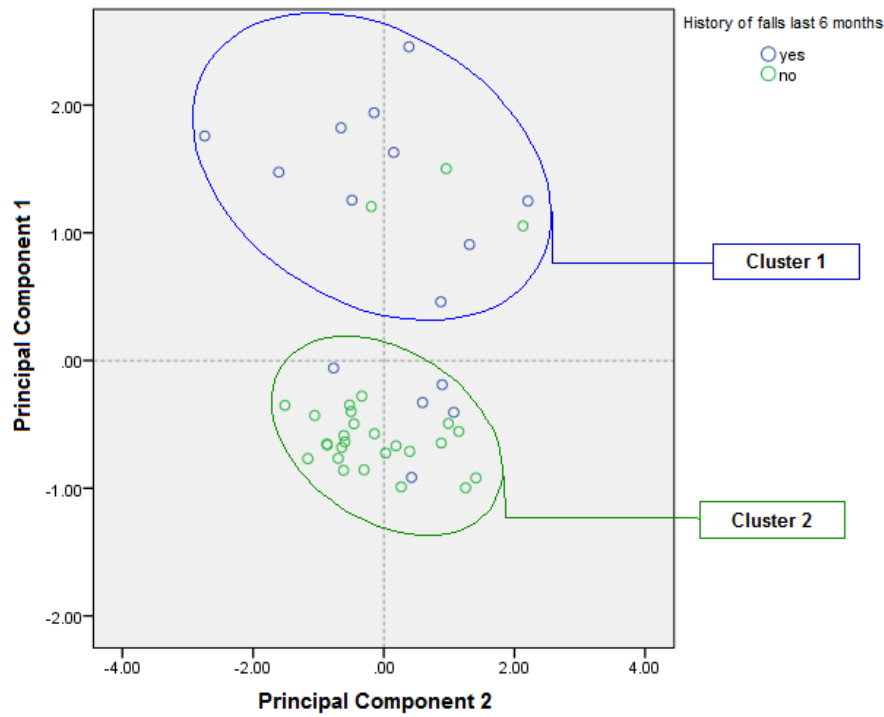


Figure 1. Score plot with PC1 and PC2.

Table 1. Component plot with loading values. *VAF=Variance Accounted For. Total VAF=85%.

	Component		VAF*
	1	2	
FES	.826	.185	0.72
MOCA	-.037	-.921	0.85
Gait speed	-.926	-.185	0.89
BERG	-.952	-.071	0.91
TUAG	.931	.222	0.92
PPA	.323	.835	0.80
Eigenvalue	3.4	1.7	0.85