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Exploring potential markers of pre-dementia risk states in motor neuron diseases: a longitudinal study of Mild Behavioral Impairment and its relation to cognition

State of the art. Mild behavioral impairment (MBI) is increasingly regarded as the neurobehavioral axis of pre-dementia risk states, but a specific investigation of its detection as a potential marker of prodromal dementia in motor neuron diseases (MNDs) is still lacking. The aims of our study were therefore to explore MBI in MNDs both at onset and over disease course, and to evaluate its relationship with baseline and longitudinal cognitive features.

Methodology. 60 MND patients with cognitive/behavioral, mood and motor examinations were recruited and followed longitudinally for up to 15 months. Associations between baseline MBI symptoms and clinical features were tested using the Spearman's correlation coefficient. Based on longitudinal data, relative deltas of variation for each cognitive measure were generated, and regression models were then used to evaluate the role of baseline MBI symptoms in predicting cognitive decline longitudinal rates.

Results. At disease onset, the most impaired MBI domain was affective dysregulation, followed by impulse dyscontrol, apathy and social inappropriateness. Greater MBI symptoms correlated with more severe baseline motor, cognitive/behavioral and mood disturbances (p values from <0.001 to 0.05). Longitudinally, the greatest decline was observed in the affective dysregulation domain, followed by impulse dyscontrol, apathy and social inappropriateness. Greater MBI symptoms at onset were significant predictors of more severe longitudinal cognitive decline in both ALS-specific and non-specific functions (p values from <0.001 to 0.03).

Conclusions. MBI represents a valuable clinical marker of incident cognitive decline in MNDs, and its evaluation has good potential for detecting dementia in its preclinical/prodromal phase.

