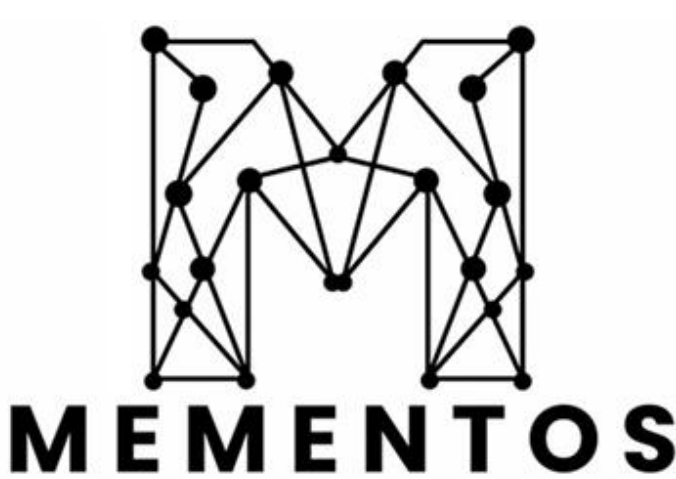


Longitudinal Associations between Mild Behavioral Impairment and White Matter Hyperintensity Progression



Tuesday - 0589

Zdenek Linha, M.Sc., Tejasvi Ravi, M.Sc., Matej Seifert, M.Sc. et M.Sc., and Pavla Brennan Kearns, MD, PhD
Department of Public Health, Second Faculty of Medicine, Charles University, Prague, Czech Republic zdenek.linha@lfmotol.cuni.cz

The association of mild behavioral impairment status and score with faster longitudinal accumulation of white matter hyperintensity volume suggests that mild behavioral impairment may identify individuals at risk of higher white matter damage.

INTRODUCTION

METHODS

RESULTS

CONCLUSIONS

TABLE 1: Participants

Mild behavioral impairment (MBI) is characterized by persistent neuropsychiatric symptoms in older adults without dementia¹. **We hypothesize that higher baseline MBI score and status would be associated with faster accumulation of white matter hyperintensity (WMH) volume**, a marker of cerebral small vessel disease and of cognitive decline², **and that this association would strengthen over time when MBI is modeled as a longitudinal measure.**

We analyzed 86 participants without dementia from the Alzheimer’s Disease Neuroimaging Initiative³ (mean 4 visits). LME models tested associations between MBI score (derived from NPI-Q) or MBI status (MBI score > 0 at two consecutive visits at least six months apart) and logarithmically transformed WMH volume (LST-LPA^{4,5} determined), adjusting for age, sex, education, MMSE, TIV, MCI status, with interaction of time since baseline and MBI measures.

MBI+ participants had lower education, lower MMSE scores, and higher proportion of participants with MCI than MBI- individuals (Table 1). Baseline MBI score and MBI+ status were associated with faster WMH accumulation over follow-up: 1.47%/year for MBI score and 6.66%/year for MBI+ status (Figure 1,2). Longitudinally modeled MBI measures showed that the associations strengthened over time: 1.31%/year for MBI score and 9.14%/year for MBI+ status (Figure 2).

These findings indicate that MBI, assessed at baseline, may identify individuals at increased risk of progressive WMH-related white matter damage. The associations observed with longitudinally changing MBI score and status suggest that worsening neuropsychiatric symptoms accompany ongoing WMH accumulation. Thus, MBI may serve as an accessible clinical marker of longitudinal brain vulnerability, rather than merely reflecting existing white matter damage.

	MBI- (n = 65)	MBI+ (n = 21)
Age	70.4 ± 6.2	69.0 ± 6.2
Female sex	33(50.8%)	8(38.1%)
Education	18.0 ± 4.0	16.0 ± 4.3
MMSE	29.0 ± 1.3	28.0 ± 2.0
MCI status	33(50.8%)	17(81.0%)
TIV (L)	1.5 ± 0.1	1.5 ± 0.2
WMH (mL)	1.4 ± 4.5	2.0 ± 5.6
MBI score	0.4 ± 1.0	4.0 ± 2.9

Abbreviations:
LME: Linear mixed-effects
NPI-Q: Neuropsychiatric Inventory Questionnaire
MMSE: Mini-Mental State Exam.
TIV: Total intracranial volume
MCI: Mild cognitive impairment

FIGURE 1: WMH Predicted Trajectories

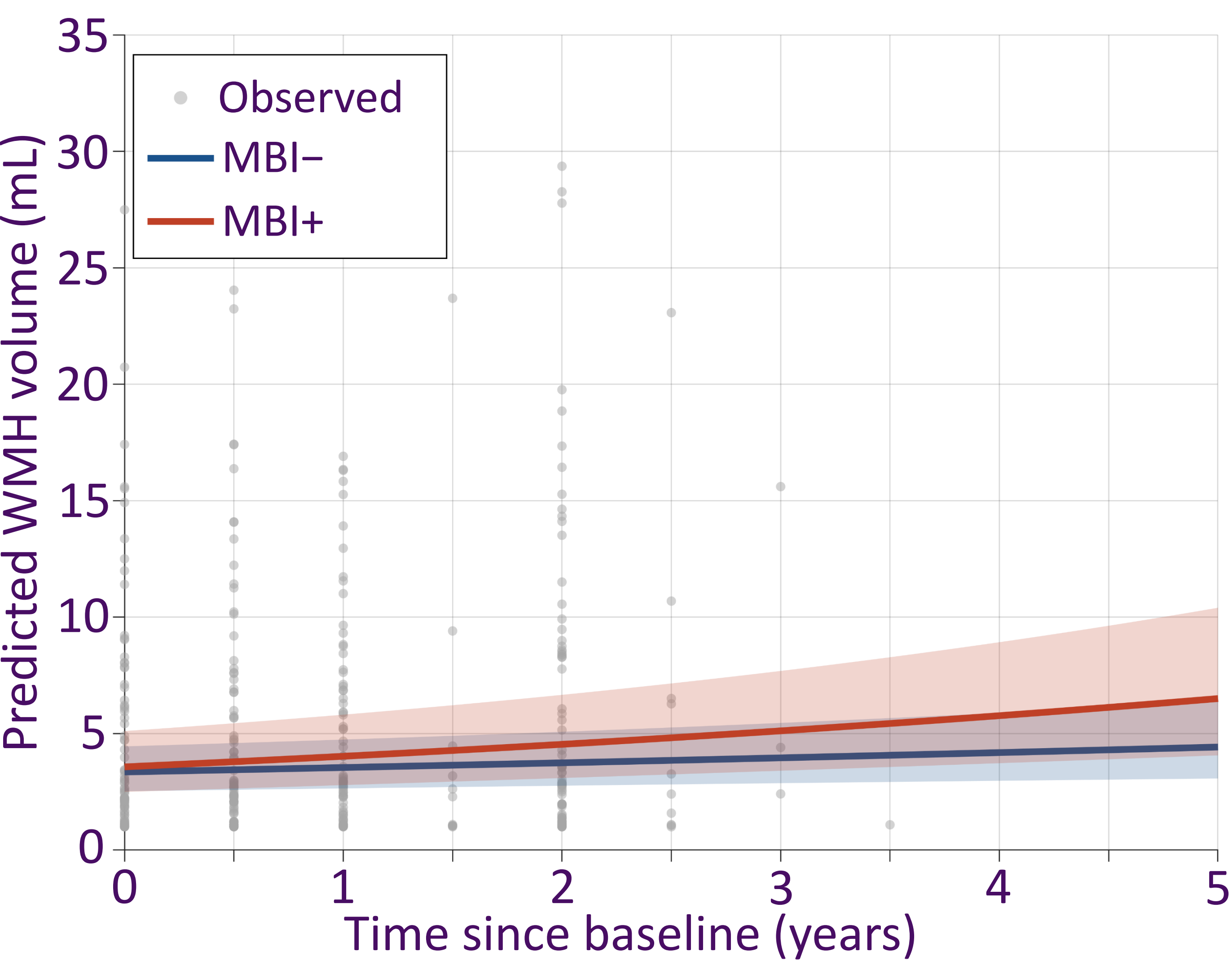
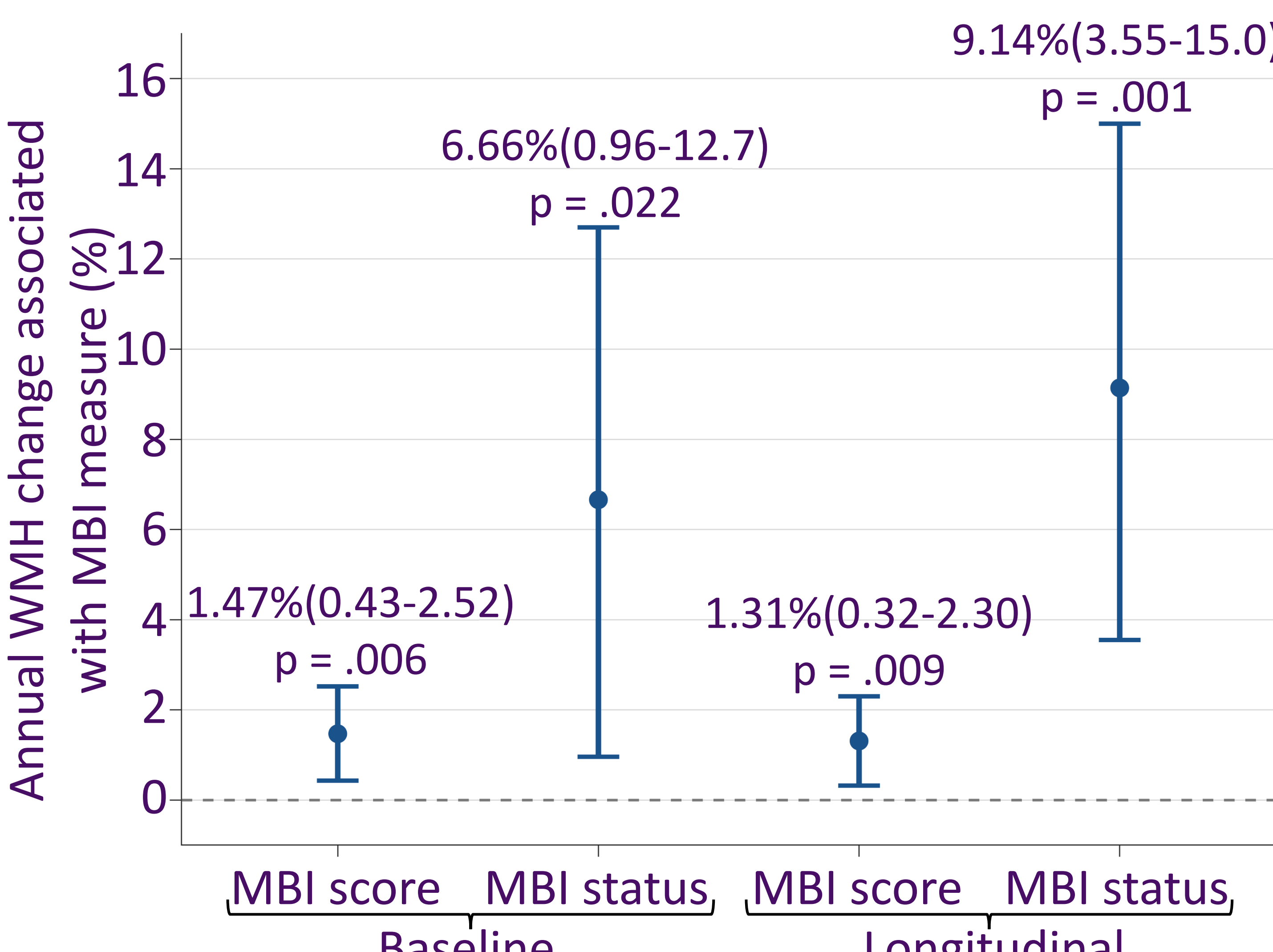


FIGURE 2: MBI × Time Interaction Effects



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