Home-Based Activity Changes Associated with MCI

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Objective
To determine if variability in motor function assessed in the home environment characterizes persons with MCI.

Background
Changes in motor function precede cognitive decline up to a decade before symptoms appear, a conclusion primarily derived from brief clinical measures of motor function such as walking speed. We hypothesized that if these measures were predictive of MCI, before they declined in absolute magnitude, there would be a period where the measure would first show increased variability.

Design/Methods
In 113 non-demented ISAAC (Intelligent Systems for Assessing Aging Change) cohort (Kaye, 2008) seniors living independently (mean age 84; CDR ≤ 0.5) multiple daily walking episodes were unobtrusively recorded as subjects traversed a line of passive infra-red motion sensors placed strategically in their home (figure 1) for a mean of 319 ± 127 days. Daily walking speeds (Hayes, 2008; Hagler, 2009) and the variance in these measures over time were calculated and compared to conventional single visit stop-watch derived speed recordings in subjects with and without MCI. Trajectory analysis using the coefficient of variation (COV) in weekly walking speeds was applied to assess differences in variability over time among subjects with and without MCI.

Results

Conclusions/Relevance
Continuous unobtrusive home monitoring may identify activity changes (walking speed and variability) that are early markers of cognitive decline.

Home-based continuous assessment metrics for discerning subtle early change may provide new measures of early change not currently accessible through conventional methodologies.

References

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