ABSTRACT

Uslu, E. (2026). Investigation of the Role of Navigational Skills on Spatial Memory in Early-Stage Alzheimer's Disease. Istanbul University, Institute of Health Sciences, Department of Neuroscience. Master's Thesis. Istanbul.

Alzheimer's disease (AD) is a neurodegenerative disorder characterized by progressive cognitive decline, and impairments in navigational abilities may emerge during the early stages of the disease. In recent years, navigational processes have been suggested as sensitive indicators for the identification of early-stage AD. The aim of this study was to compare navigational abilities and spatial memory performance between individuals with biomarker-confirmed early-stage AD and healthy controls.

A total of 37 participants, including 17 patients with cerebrospinal fluid (CSF) biomarker-confirmed early-stage AD and 20 healthy controls, were included in the study. Participants were assessed using Sea Hero Quest (SHQ), a comprehensive neuropsychological test battery, and navigation-specific self-report measures. SHQ performance was evaluated using completion time and distance traveled in wayfinding tasks, as well as accuracy scores obtained from path integration tasks.

The findings showed that the patient group demonstrated lower performance in path integration and navigation-related self-report measures compared to healthy controls. In contrast, no significant group differences were observed in wayfinding measures, including completion time and distance traveled. Neuropsychological assessments revealed lower MMSE, ACE Attention, ACE Memory, and WMS-R Visual Span Forward scores in the patient group. In addition, covariance analyses indicated that educational level was significantly associated with SHQ performance.

The findings suggest that path integration performance and navigation-related self-report measures may serve as sensitive indicators of early-stage AD. The results further indicate that navigational assessments may provide complementary information to conventional neuropsychological measures.

Keywords: Alzheimer's disease, Sea Hero Quest, path integration, spatial memory, navigational strategies