

The ageing of the world's population means that the number of people with dementia, especially Alzheimer's disease (AD), will dramatically increase. That's why there is now a great effort to detect the presence of AD in its earliest predementia stages, in the stage of mild cognitive impairment (MCI), and particularly to identify individuals with amnesic syndrome of the hippocampal type (Ha-MCI – preclinical AD). The aim of our studies was to reveal whether spatial navigation testing could serve as an early biomarker of AD – whether spatial navigation is impaired early in patients with MCI, especially in Ha-MCI patients. We used the human analogue of the Morris water maze, the Hidden Goal Task (HGT), which is designed to separate two different modes of navigation, egocentric (body-centred, hippocampus independent) and allocentric (world-centred, hippocampus dependent), using a real space navigation setting called the Blue Velvet Arena (BVA), fully enclosed cylindrical arena, as well as a computer version of the BVA. Our results suggest that spatial navigation is impaired already in patients with amnesic MCI, who are more likely to progress to AD, especially in those with amnesic syndrome of the hippocampal type. The Ha-MCI patients presented severe spatial navigation impairment similar to that seen in AD patients. It proves that spatial navigation testing can be a potential biomarker of AD.