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HIPPOCAMPAL VOLUME, EARLY COGNITIVE DECLINE AND GAIT VARIABILITY: WHICH ASSOCIATION?

In contrast to its prominent function in cognition, the involvement of the hippocampus in gait control is still matter of debate. The present study aimed to examine the association of the hippocampal volume with mean values and Coefficients of Variation (CoV) of spatio-temporal gait parameters among Cognitively Healthy Individuals (CHI) and patients with Mild Cognitive Impairment (MCI). A total of 90 individuals (47 CHI with mean age 69.7 ± 3.6 years and 48.9% women, and 43 MCI individuals with mean age 70.2 ± 3.7 years and 62.8% women) were included in this cross-sectional study. The hippocampal volume was quantified from a three-dimensional T1-weighted MRI using semi-automated software. Mean values and CoV of stride time, swing time and stride width were measured at self-selected pace with a 10m electronic portable walkway (GAITRite®). Age, gender, body mass index, number of drugs daily taken, Mini-Mental State Examination (MMSE) score, history of falls, walking speed and white matter signal-intensity abnormality scoring with Manolio scale were used as covariates. Patients with MCI had a lower MMSE score ($P < 0.001$), a higher CoV of stride time ($P = 0.013$) and a lower hippocampal volume ($P = 0.007$) compared with CHI. Multiple linear regression models showed that CoV of stride time was specifically associated with higher hippocampal volume among CHI ($P < 0.05$) but not among patients with MCI ($P > 0.650$). Our findings revealed a positive association between a greater (i.e., better morphological structure) hippocampal volume and a greater (i.e., worse performance) stride time variability among CHI, but not among MCI individuals.

Biography

Olivier Beauchet has completed his doctorate in Neurology and Geriatrics (1995 to 2000) at Saint-Etienne University, France. In 2005, he obtained his PhD in "Human Motor Function and Disability". He was appointed as a full Professor in 2008 at Angers University, France. He was recruited by McGill University in 2015, when he was appointed as the prestigious Joseph Kaufmann Chair in Geriatrics and the Director of the Centre of Excellence on Aging and Chronic Disease. Presently, he is a full Professor of Geriatrics at McGill. He is a recognized world leader in research on age-related gait disorders.

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