Objective

Age-related loss of physical ability and balance control are important predictors for falls in older people. Activities of daily life, such as stair negotiation, are challenging as they require older people to operate close to their functional limits. This makes stair negotiation performance a good candidate to detect early-onset deterioration before a fall occurs, as well as a good task-specific exercise modality. To investigate these assumptions, I will first assess the sensitivity of linear and non-linear analyses of data from body-worn inertial measurement units (IMUs) to detect age-related and training-induced changes in balance control of older people (65+ years). These findings will then be applied to assess improvements of balance control and the underlying changes in neuromuscular organisation following a 1-year home-based stair climbing exercise program in older people. Finally, I aim to elucidate the role of cortical involvement in neuromuscular organisation during stair negotiation in older
people using electroencephalograms and analyses of muscle synergies obtain from electromyographic signals of the lower limb muscles. This will allow me to assess the level of cortico-synergy coherence and the plastic changes associated with training-induced adaptations in kinematic profiles during stair negotiation. The findings from this project will contribute to a better understanding of age-related and training-induced adaptations in balance control, neuromuscular organisation, and the role of cortical involvement in task-specific adaptations. In addition, the assessments of sensitivity of current and novel analyses of inertial data will help to improve detection of early-onset deterioration of balance performance to better target training interventions at individuals with increased fall risk.

Keywords

Biomechanics

Programme(s)

HORIZON.1.2 - Marie Skłodowska-Curie Actions (MSCA)

Topic(s)

HORIZON-MSCA-2022-PF-01-01 - MSCA Postdoctoral Fellowships 2022

Call for proposal

HORIZON-MSCA-2022-PF-01

See other projects for this call

Funding Scheme

HORIZON-TMA-MSCA-PF-GF - HORIZON TMA MSCA Postdoctoral Fellowships - Global Fellowships

Coordinator
STICHTING VU
Net EU contribution
€ 270 829,44

Address
De boelelaan 1105
1081 HV Amsterdam
Netherlands

Region
West-Nederland > Noord-Holland > Groot-Amsterdam

Links
Contact the organisation Website Participation in EU R&I programmes HORIZON collaboration network

Other funding
€ 0,00

Partners (1)

NEUROSCIENCE RESEARCH AUSTRALIA
Australia
Net EU contribution
€ 0,00

Address
139 barker street
2031 Randwick

Activity type
Research Organisations

Links
Contact the organisation Participation in EU R&I programmes HORIZON collaboration network

Other funding
€ 0,00

EC signature date 20 July 2023
Last update: 10 August 2023