



HAL
open science

Interest of the task of “Stepping in place” in the assessment of freezing in Parkinson’s disease patients

Benoît Sijobert, Cindy Lebrun, Valentin Begel, Claudia Verna, Giovanni Castelnovo, Simone Dalla Bella, Christine Azevedo Coste, Christian Geny

► To cite this version:

Benoît Sijobert, Cindy Lebrun, Valentin Begel, Claudia Verna, Giovanni Castelnovo, et al.. Interest of the task of “Stepping in place” in the assessment of freezing in Parkinson’s disease patients. *Annals of Physical and Rehabilitation Medicine*, 2015, 58, pp.e71-e72. 10.1016/j.rehab.2015.07.176 . lirmm-01238411

HAL Id: lirmm-01238411

<https://hal-lirmm.ccsd.cnrs.fr/lirmm-01238411>

Submitted on 4 Dec 2015

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L’archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Interest of the task of “Stepping in place” in the assessment of freezing in Parkinson's disease patients

*Mr. Benoit SIJOBERT^a, Mrs. Cindy LEBRUN^b, Mr. Valentin BEGEL^b, Ms. Claudia VERNA^c,
Dr Giovanni CASTELNOVO^d, Prof Simone DALLA BELLA^d, Mrs. Christine COSTE^a,
Dr Christian GENY^e*

*^a INRIA-LIRMM, Montpellier, ^b M2H Euromov, Montpellier, ^c Centre Expert Parkinson, Montpellier, ^d Service
de neurologie, CHU Caremeau Nimes, ^e Centre Expert Parkinson, Service de Neurologie, M2H-Euromov,
Montpellier*

Objectives: Freezing of gait (FOG) in Parkinson's disease (PD) is challenging to measure. Repetitive stepping in place (SIP) task on force plates has been proposed by Nantel and al in 2011 for identifying freezing episodes (FEs) in PD patients. These authors have correlated this task with the validated FOG questionnaire (FOG-Q). The inability to maintain a walking rhythm could be alleviated by external cues involving a sensorimotor network underlying the processing of rhythm (Dalla Bella et al., 2014)

Material and methods: 24 PD patients have been included: 8 without freezing, 8 with severe freezing and 8 mild “freezers”. PD subjects were assessed using the MDS-UPDRS, MoCA, FAST, MiniBest test, questionnaires, and were submitted to the BAASTA battery, which consists of a series of perceptual timing and sensory timing tasks. Single wireless inertial sensors were placed on the patient's lower limbs. A computerized algorithm providing automatic detection of FEs during SIP, Timed Up and Go test and 20 m walk has been used.

Results: Preliminary results show that there is some discrepancy between patients' self-assessment, SIP and walking task measurements. The occurrence of freezing episodes is highly variable in mild freezers and depends on the emotional context and the repetition of the tasks. This could be explained by the fact that the timing of our assessment has been performed in less severe off state than in Nantel's study(12 hours off dopa) and which is closer to the patients' daily life.

Discussion/conclusion: SIP is of limited interest in the assessment of freezing in patients with partial "on state". Analysis of correlations with neurological status, kinematics, perceptual and motor timing tasks will aid in clarifying the interest of this new task in the assessment of freezing in PD patients.

Keywords : freezing. Parkinson. Stepping in place. timing