

“Paradoxical increase” of pacing frequency (Hz) in early Multiple Sclerosis (MS) patients is unraveled by clinical observation, focusing on gait analysis

Non Peer-reviewed author version

VAN ZWIETEN, Koos Jaap; NARAIN, Faridi & SCHMIDT, Klaus (2011) “Paradoxical increase” of pacing frequency (Hz) in early Multiple Sclerosis (MS) patients is unraveled by clinical observation, focusing on gait analysis. In: International Sound and Vibration Digest, 12(6), p. 9-10.

Handle: <http://hdl.handle.net/1942/13017>

“Paradoxical increase” of pacing frequency (Hz) in early Multiple Sclerosis (MS) patients is unraveled by clinical observation, focusing on gait analysis. Laboratory of Anatomy, BioMed Institute, University of Hasselt, Belgium. - K. J. van Zwieten, F.H.M. Narain, K.P. Schmidt.

The pacing frequency of normal walking lies between about 1.5 and 3.0 Hz (Górny et al., 2002). Data from a pioneering study by Dr. C. Martin and associates (2006) who quantified gait impairment in early multiple sclerosis (MS) patients compared to control subjects, revealed a paradoxical increase of pacing frequency by 2 % in such MS patients. A comparable study by Kelleher et al. (2010) reveals an even more dramatic increase (more than 13 %). Step length and gait speed in early MS patients, however, decreased by 15-25 %. Although “there is no ideal measure of walking for patients with MS, it is necessary to recognize the importance of walking and mobility from both the clinical and patient perspectives” (Bethoux & Bennett, 2011). To unravel this paradoxical frequency increase in early MS, our Functional Anatomy Movement Division at the University of Hasselt, Belgium, in 2011 studied video footage of MS patients. We did so, using clinical observation and gait analysis, cooperating with the University of Suriname Movement Analysis Laboratory under the supervision of Dr. K. S. Lamur. In early MS patients, weak ankle muscles cause the foot to drag. There is a prolonged contact of the mid-foot with the floor. Subsequent swing phases may show foot-drop, as a consequence of the weak *tibialis anterior* and *extensor digitorum* muscles. During swing, by weakness of foot-evertor muscles, hardly any lifting of the foot’s lateral side is seen. At the end of swing, patients with higher disability scores “tend to strike the floor more often with their mid-foot” (Kelleher et al., 2009), thereby showing little foot dorsiflexion. In stance however, the “safe” double limb support phases prolong significantly. Combined with the “rudimentary” swing phases, it permits patients to increase their pacing frequency.