OP15

Gait velocity: A potential index of functional outcome in patients with diabetic foot complications

[3]Kanade RV, [2]Price PE, [2]Harding KG, [1]van Deursen RWM
[1]Research Centre for Clinical Kinaesiology, [2]Wound Healing Research Unit,
Cardiff University, Wales, UK, [3]Dept of Physiotherapy Education, University of Nottingham, England, UK

Background: Diabetic foot complications namely foot ulceration, and lower limb amputations are known to have a detrimental effect on people's activity level which in turn can negatively affect their health status. For monitoring purposes, a simple measure of functional activity is desirable but this is a challenge because of its complex nature. A multi-dimensional model could be proposed to measure various domains of functional activity i.e. mobility, level of activity and H-RQOL, but this may not be feasible in the clinical environment. To date no single measure is known to represent the overall functional status in patients with diabetic neuropathy (DMPN). However gait velocity is a generally acceptable outcome measure in various other patient groups. Therefore, the aim of this study was to investigate whether gait velocity substantially correlates ($r > 0.61$) with other functional domains in patients with diabetic foot complications, to determine if it can be used as an overall functional outcome measure. **Methods:** Twenty-three patients with diabetic neuropathy with no history of ulceration (DMPN), 23 patients with diabetic foot ulceration (DFU), 22 patients with trans-tibial amputation (TTA) and 16 patients with partial foot amputation (PFA) participated in the study. All subjects signed an informed written consent. Gait velocity was measured using a digital video camera. A Kistler force platform was used to measure standing balance. Plantar pressure distribution during walking was recorded using the Pedar in-shoe system. Capacity of walking was measured using the Total Heart Beat Index (THBI) which is an indicator of energy expenditure during walking with the Continuous Polar Heart Rate Monitor and the performance of walking was recorded using the Step Activity Monitor. Patient's participation in physical and social life was assessed with self-administered SF-36. The statistical analyses was performed by means of Pearson correlation coefficient using SPSS-15 ($\alpha = 0.05$). **Results:**
The speed of walking was inversely correlated with standing balance ($r=-0.56$, $p<0.001$) and energy expenditure during walking: THBI ($r=-0.68$, $p<0.001$). Whereas the speed of walking was positively correlated with plantar pressures ($r=0.30$, $p<0.01$), average daily walking ($r=0.50$, $p<0.001$), self-reported physical and social function: SF-36 physical function ($r=0.55$, $p<0.001$), SF-36 social function ($r=0.41$ $p<0.001$). **Discussion:** Significant correlations between gait velocity and standing balance, plantar pressures, THBI, average daily walking, physical & social function scores indicate that gait velocity is associated with each of these measures which are used to assess functional outcome. However, the strength of the associations was less than substantial for most relationships except walking capacity, which implies that it is necessary to measure multiple domains of functional activity. Therefore, gait velocity can be used as a simple, useful index of functional outcome in daily clinical practice among patients with diabetic foot complications however; it cannot sufficiently represent all aspects of functional activity.