
Downloaded from: http://e-space.mmu.ac.uk/624531/
Publisher: SAGE Publications
DOI: https://doi.org/10.1177/2396987319845578

Please cite the published version
Background and Aims

One in ten adults who experience a stroke are under the age of fifty years. Most are unable to return to employment or participate in social activities from their difficulties walking. No research study has comprehensively analysed how a stroke affects walking performance or efficiency in young adults. This study aimed to investigate how a stroke in young adults affects walking performance and energy cost during walking compared to healthy age-matched controls.

Methods
Participants who had experienced a stroke (18-40 years: \(n = 6\), 41–54 years: \(n = 20\), 55–65 years: \(n = 15\)) and controls (\(n = 15\)) were recruited from six health boards in Wales, UK. Type, location and cause of stroke, occupation and smoking status were recorded. Walking performance was measured using three-dimensional gait analysis and energy cost through measurement of energy expenditure during three minutes of walking.

Results

Stroke participants walked slower and had a higher energy cost of walking than control (Figure 1a and 1b). 96% were in full-time employment pre-stroke, but only 22% returned to employment post-stroke. Those who returned to employment post-stroke walked significantly faster, with lower energy cost and with greater walking symmetry than those who did not return to employment (Figure 2).

Figure 1a presents a correlation between age and walking speed \((r = -0.216\;\text{(p = 0.145)})\) and Figure 1b presents a correlation between age and metabolic cost of walking \((r = 0.246\;\text{(p = 0.100)})\). Pink circles represent stroke participants and blue triangles represent controls with light colour representing 18-40 years, medium colour 41-54 years and dark colour 55-65 years. Vertical black dotted lines represent age groups.
Conclusions

Young adults who have had a stroke and are unable to walk faster than ~1.15 m/s post-stroke are unlikely to return to work post-stroke. It is recommended that walking speed is used as an indicator of performance post-stroke. Rehabilitation for return to work should be aimed at increasing walking speed and reducing energy cost.