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Final report summary:

Can distraction improve community walking after stroke?

Improving community walking after stroke: a new approach (WALK)

PROJECT CODE: TSA 2011-07
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Why did we fund this research?

Whilst four out of five stroke survivors recover the ability to walk[1], most can only do so over short distances, and report difficulty regaining the ability to walk in the community[2]. This limited mobility has important health and wellbeing implications.

A stroke survivor with limited physical activity and fitness is susceptible to having a further stroke or other diseases related to inactivity. This will have an impact upon their social activities and quality of life. Any intervention that improves walking endurance, health and community mobility may therefore have important outcomes for stroke survivors.

A number of walking training programmes have been effective at improving walking performance following stroke. However, the ability to cope with distractions during walking is needed for successful walking in the community.

A promising approach for improving walking in community settings is known as 'dual task training', which combines thinking tasks within walking training programmes [3,4,5]. This study set out to investigate the effect of a dual task treadmill walking training programme on walking performance.

In order to better understand how the training works, and why some people may respond better than others, the underlying brain activity linked with changes in walking performance was also investigated.

If successful, the intervention could provide important health benefits to stroke survivors, as well as possibly reducing their care and health support.

What did the researchers do?

Fifty stroke survivors were recruited to a randomised controlled trial at least six months after having a stroke. The participants were randomly assigned to either i) a combined treadmill walking training programme integrated with a number of engaging thinking tasks (dual-task treadmill walking group), or ii) a programme of the same treadmill walking alone (control treadmill walking group).

At the start of the trial and ten weeks after the trial, measurements were taken of each participant's walking ability; walking ability whilst performing simultaneous thinking tasks; self-reported community mobility and confidence; health and wellbeing; thinking and memory; and physical activity in leisure, work and at home.

Changes in brain activity were measured during walking on a treadmill by a technique called Near InfraRed Spectroscopy (NIRS). This recorded brain activity from sensors placed on the participant's head.

To help determine if the intervention could be useful in clinical practice, how well participants kept to the training programme was measured and they were asked how acceptable participating in the trial had been.

Participant engaged in treadmill walking

Thinking tasks included listening to audio clips, conversation involving planning of activities, and maths and language thinking tasks.

Both walking programme arms of the trial consisted of 20 sessions delivered over a 10 week period of 45 minutes treadmill walking, performed with or without additional thinking tasks depending on the group.

What did the research find?

Stroke survivors were able to safely participate in the planned intervention in community gym settings. People with a range of ability levels including those requiring support during walking successfully completed the training.

Participants in the dual-task treadmill walking group managed to train at the same exercise intensity and achieve the same physical performance gains in walking during their training as the control treadmill walking group.

Both treadmill walking programmes led to improvements in two minute walking distance, two minute walking distance when performing thinking tasks, global cognition, health and wellbeing. The improvements gained during the ten week program were further improved when participants were measured after a follow up period ten weeks later.

There was a trend towards participants of the dual-task treadmill walking group gaining bigger improvements in functional activities, and two minute walking distance, than the control treadmill walking group. However, there were no improvements in community walking.

Brain activity during walking was also altered in stroke survivors, when compared with previous data from healthy participants without stroke. There were some indications that this altered brain activity began to improve in response to the dual task walking training programme.

Further investigation is needed to fully understand the mechanism behind the observed improvements.

What does this mean for stroke survivors?

A 10 week programme of treadmill walking with distraction tasks was found to be no better than the treadmill walking programme alone for improving community walking for stroke survivors.

Both provided similar benefits in terms of improved physical performance when walking, cognition (thinking and memory) and health and wellbeing.

References

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