

Power Plate[®] Training Improved Walking Function in Spinal Cord Injury Patients

This is a summary of a study published in the international scientific journal *Gait & Posture* (2009).

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Study Conclusions:

- Consistent use of Power Plate can result in an increase in walking function as defined by walking speed.
- After 12 sessions of Power Plate intervention, an increase in cadence, step length and intralimb coordination was noted.

Introduction:

Spinal cord injury (SCI) is defined as damage to the white or grey matter contained within the spinal cord, which carries signals to and from the brain. A common consequence of SCI is loss of walking function, but where the tissue has not been totally damaged (an incomplete lesion), there is the possibility that patients may be able to walk again. In these cases, it is muscle weakness and sensory impairment which can limit a person's ability to walk. Rehabilitation of SCI patients focuses on regaining walking function.

The purpose of this pilot study (a small-scale study to test feasibility, methods and procedures) was to determine whether repeated use of Power Plate could effect with improvements in walking function, as defined by changes in walking speed, in individuals with chronic, incomplete SCI.

Method:

The study involved 17 subjects with SCI, all of whom had the physical ability to rise from sitting to standing (using upper body support) for at least one minute.

Each person participated in a Power Plate exercise program of three sessions per week for four weeks. Each session included four 45 second periods of vibration, with one minute of seated rest in between. Power Plate was set at 50Hz low.

Results:

To evaluate the effectiveness of the Power Plate exercises, measurements were taken at the start of the study, and after four weeks of training. The researchers measured:

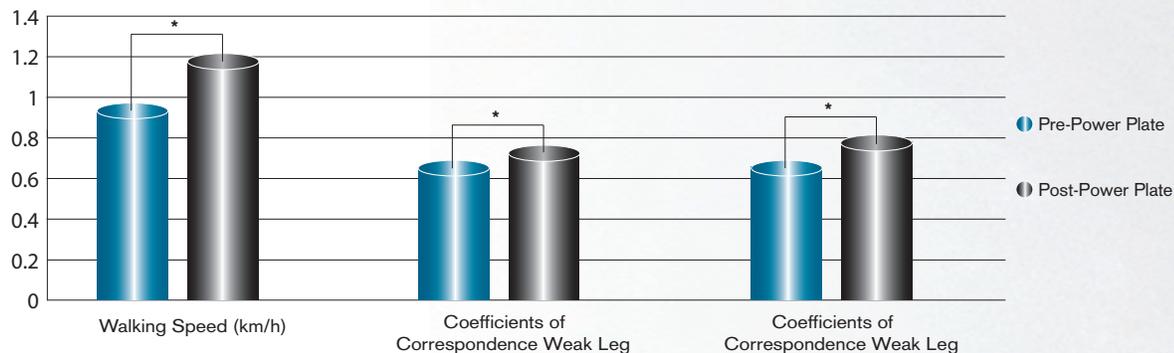
- Walking speed, measured in kilometers per hour (km/h)
- Cadence (number of steps taken in a given time)
- Strong and weak leg step length
- Strong and weak intralimb (within one limb alone) coordination. This is the ability to produce a consistent relationship of the hip angle to knee angle coupling over multiple steps.

As illustrated in Figure 1, Power Plate training resulted in a significant increase in both walking speed and intralimb coordination (as shown by the increased coefficients of correspondence).

The increase in walking speed was attributed to an increase in cadence and step length in both the strong and weak leg. As illustrated in Figure 2, there was a significant increase in these factors also.

Figure 1

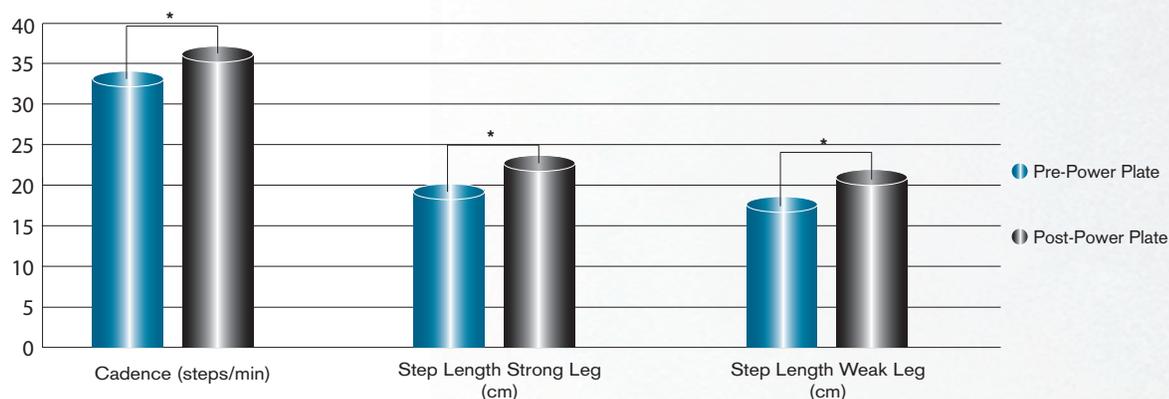
The coefficients of correspondence are used to express the intralimb coordination



*Significant difference between pre- and post-Power Plate intervention.

Figure 2

Group mean changes in cadence and step length in the strong and weak leg.



Discussion and Conclusions:

The results of this study suggest that consistent use of the Power Plate machine by people with chronic, incomplete SCI, can help to increase walking speed, cadence and step length, all of which will help to improve walking function. An improvement in the consistency of intralimb coordination over multiple steps was also noted after use of Power Plate.

Although the change in walking speed (0.23 km/h) may not appear high, other scientific research (Perera et al. 2006) indicates that a change of 0.18 km/h is considered to be clinically meaningful. Therefore, the improvement noted in this particular study is clinically meaningful.

The improvement in walking speed observed after consistent use of Power Plate is comparable to that reported in literature about other forms of training that may help increase mobility. The level of change observed in this study is considered clinically meaningful, even in non-clinical populations. Therefore exercise on Power Plate may be a useful way to improve walking function in those with SCI.