

Abstract

Slacklining in stroke rehabilitation: a case study addressing lower limb weakness and balance

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ABSTRACT

Aim: To ascertain the effectiveness of slacklining as a supplementary therapy for elderly stroke patients who are functionally non-progressing.

Methods: This case study involved an 18-month prospective observation of the management of an eighty-seven-year-old female stroke-patient of the left hemisphere with reduced balance, reduced lower limb muscular activation, hypertonia, and concurrent postural deficits. This entailed the initial acute care phase through to discharge to home and 18-month final status in her original independent living setting. The introduction of slacklining as an adjunct therapy was made 12 months post incident. Slacklining involves balance retention on a tightened band where external environmental changes cause a whole-body dynamic response to retain equilibrium. It is a complex neuromechanical task enabling individualized self-developed response strategies to be learned and adapted. This facilitates the innate process of balance retention, lower-limb and core muscle activation, and stable posture through a combination of learned motor skills and neurological system down regulation. Individuals adopt and follow established sequential motor learning stages where the acquired balance skills are achieved in a challenging composite-chain activity. Slacklining could be considered an adjunct therapy for lower limb stroke rehabilitation where function is compromised due to decreased muscle recruitment, decreased postural control and compromised balance.

Results: Initial inpatient rehabilitation involved one-month acute-care, one-month rehabilitation, and one-month transitional care prior to home discharge. A further six months of intensive outpatient rehabilitation was provided with five hourly sessions per week including; supervised and self-managed hydrotherapy, plus one individual and two group falls' prevention sessions. These were supported by daily home exercises. At 12 months post incident, recovery plateaued, then regressed following three falls. Rehabilitation was subsequently modified with the hydrotherapy retained and the group sessions replaced with an additional individual session supplemented with slacklining. The slacklining followed stages one and two of a standardized five-stage protocol. Self-reported functional progression resumed with improvement by 14 months which further increased and was sustained 18 months (student t-test $p<0.05$).

Conclusions: Slacklining's external stimulations activate global-body responses through innate balance, optimal postural and potentially down-regulated reflex control. Incorporated into stroke rehabilitation programs, slacklining can provide measurable functional gains.

Core Tip

Slacklining may supplement stroke rehabilitation where lower limb function is compromised. This case study considers an 87-year-old female with reduced balance, reduced lower limb activation, and hypertonia. Rehabilitation from acute care to home discharge and subsequent six-month intensive outpatient therapy showed progression then plateaued at nine months. Three falls resulted in regression and rehabilitation was modified by supplementing slacklining. Functional progression improved by 14 months and was sustained at 18 months. Slacklining's external stimulations activate global-body responses through innate balance, optimal postural response and potentially down-regulated reflex control that can provide quantifiable functional gains. Further prospective cohort studies are required.

CONFLICT OF INTEREST

C P Gabel is a Company Director of Advise Rehab outcome measurement software.

N Rando and M Melloh have no conflict of interest.

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