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Case Report

Effect of my fit trainer for balance rehabilitation in chronic stroke patient: a case study

Abhilasha B. Patil*, Komal D. Thorat

Department of Neuro Physiotherapy, Dr. A. P. J. Abdul Kamal College of Physiotherapy, Pravara Institute of Medical Sciences, Loni, Maharashtra, India

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***Correspondence:**
Dr. Abhilasha B. Patil,
E-mail: abhilashapatil0909@gmail.com

ABSTRACT

Stroke is the third most common cause of death in the world and most common cause of adult disability of the survivors. Balance problems in stroke is very common, and they have been implicated in the poor recovery of activities of daily living (ADL) and mobility and an increased risk of falls. They also have altered in body weight distribution patterns, so that less body weight is taken through the weaker leg have smaller excursions when moving their weight toward the base of support, mostly in the direction of the weaker leg. My fitness trainer (MFT) balance board consists of a uniaxial unstable platform with an integrated sensor, which records all discrepancies in the plane. A 30-year-old female who has history of stroke 4 year ago has chief complain of weakness of upper limb and lower limb and unable to maintain dynamic balance. In this study we assessed the patient on berg balance scale and my fit trainer balance board with pre score and post score which shows significant improvement in results. The Berg balance scale measure score from 37/56 pre-treatment to 48/56 post treatment which shows significance increase in berg balance scale. The MFT balance board measure score from 4.2 disappointed stability in 30 seconds pre-treatment and 3.4 improve stability in 120 seconds post treatment which shows significance increase in MFT balance board. It concluded that there is effect of MFT to improve balance in chronic stroke patient.

Keywords: My fit trainer, Balance, Independence

INTRODUCTION

Stroke is the third most common cause of death in the world and it is the most common cause of adult disability of the survivors, about 50% will have a significant long-term disability. Balance problems in stroke is very common, and they have been implicated in the poor recovery of activities of daily living (ADL) and mobility and an increased risk of falls.[5] The terms balance, postural reactions and control posture equilibrium are used interchangeably, but there are neither commonly accepted definitions for these terms nor any consistency in the way in which they are used.[6] Many studies have measured balance impairments (such as postural sway, weight distribution and etc.) rather than balance disability (the type of balance task that a subject can perform while maintaining the upright position, such as static or dynamic sitting or standing balance), Studies of balance impairments consistently have shown that people with stroke have greater postural sway than age-matched volunteers who are healthy individual.[8] They also have altered in body weight distribution patterns, so that less body weight is taken through the weaker leg have smaller excursions when moving their weight toward the base of support, mostly in the direction of the weaker leg.[7] This pattern is seen in all aspects of balance-static, dynamic, or responses to external perturbation and even in people with stroke with high levels of function, such as those who are ambulatory in the community.[1]

My fitness trainer (MFT) balance board was produced for skiers and then they practice their skills in the off season

and at night, a balance board is a device that has come to be used for training in all sports and martial arts, physical fitness and for non-athletic purposes. My fitness trainer balance boards and discs feature a unique modular design that is easily adaptable for athletics training therapy, rehabilitation, senior fitness.[9] It was developed by 'Ewald Aigner', trainer for the Austrian ski team for 5 years. It is used to developed balance, motor coordination skills, weight distribution and core strength.[10] As the age increases to avoid injury falls; to prevent sports injuries, especially to knee and ankle, treatment after injuries to several parts of the body. Uses of a balance board that are distant from the athletic purpose of its origin have gradually become most common to expand the neural networks and that enable the left and right hemispheres part of the brain to communicate with one of each other. MFT balance board is a reliable and valid balance measurement system for performance and sensorimotor regulation during lateral and forward, backward test.

The test system consists of a uniaxial unstable platform with an integrated sensor, which records all discrepancies in the horizontal plane. All function of centre of gravity are measured and transformed into stability, sensorimotor and symmetry indexes to define the individual state of balance. For dynamic standing stability on an unstable support surface, this shows good reliability, objectivity and validity. However, in stroke patient have impaired balance hence, the objective of the study to find out the effect of MFT balance board training in stroke patient.[2]

CASE REPORT

A thirty-year female patient with right side dominance came to outpatient department of neurophysiotherapy, Pravara Rural Hospital, Loni, Ahmednagar with chief complains of weakness in right upper limb and lower limb and difficulty in maintaining dynamic balance. The patient had history of stroke 3.5 years back since then she is on medication for 2 years and now came for physiotherapy treatment.

On physiotherapy assessment a muscle tone according to modified Ashworth scale: for right upper limb-shoulder flexors 1, shoulder extensors-0, elbow flexors 1+, extensors-normal, wrist flexors and extensors-1+ and for left side upper limb-normal, right lower limb-hip normal, knee flexors-1, knee extensors normal, ankle-normal and for left lower limb-normal and sensation-intact.

C reflex examination revealed all the reflexes presented MMT of both upper limb and lower limb, left upper limb-5/5, left lower limb-3/5 and right upper limb 3/5 and right lower limb-3/5, ROM: bilateral upper limb having full range of motion and lower limb having full range of motion. f balance-sitting static balance-intact, sitting dynamic balance-intact, in standing static balance-intact, standing dynamic balance-altered, according to Berg balance scale patient belong to medium fall risk.

Outcome measures

Berg balance scale: total score 56, 41-56=low fall risk, 21-40=medium fall risk, and 0-20=high fall risk. My fitness trainer balance board: total 5 score: 1-excellent stability, 2-good stability, 3-improved stability. 4-disappointing stability, and 5-bad stability.

Intervention

My fitness trainer balance board-30 minutes 3 times a week for 4 weeks.

Figure 1: Pre-treatment score.

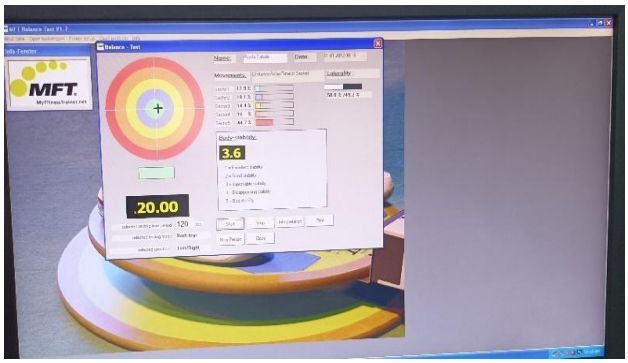

Figure 2: Post-treatment score.

Table 1: Outcome score.

Outcome measures	Pre-score	Post-score
Berg balance scale	37 /56	48/56
My fitness trainer balance board	In 30 sec-4.2, disappointed stability	In 120 sec-3.6, improved stability

Results

The Berg balance scale measure score from 37/56 pre-treatment to 48/56 post treatment which shows significance increase in berg balance scale.

The MFT balance board measure score from 4.2 disappointed stability in 30 seconds pre-treatment and 3.4

improve stability in 120 seconds post treatment which shows significance increase in my fitness trainer balance board.

DISCUSSION

In stroke patient various intervention have been studied in an attempt to improve balance in last few years. In patients with stroke have seen that loss of balance is the one of the most devasting consequences and it is the first priority of treatment in population the need of improving balance is necessary as it is important in daily activities, improving independence and quality of life.[1]

To improve balance exercise therapy is the key player in rehabilitation. Balance and equilibrium constitute a complex reflexive response initiated by three primary sensory system (vestibular, visual and somatosensory) and coordinated by central nervous system. Until about twenty years ago simple behavioural tests such as, Romberg and Mann test were used to test postural control. More recently computer post urography has been developed and evaluated (Turner 1998). These devices allow the assessment of balance function more exactly, objectively and efficiently.[2]

In addition, by giving the individual visual feedback from which they become more aware of body displacement and orientation in space and they were able to integrate somatosensory and visual information in relation to stance and movement, which may recalibrate deficient proprioceptive information and compensate the sensorimotor deficit and many studies have utilized a balance board as a way to demonstrate functional adaptation of spinal body reflex in healthy and adult population.[4]

In this study we assessed the patient on Berg balance scale pre score 37/56 and post score 48/56, MFT balance board pre score 4.2 disappointed stability and post score 3.4 improve stability which showed significant improvements in results.

CONCLUSION

It concluded that there is effect of MFT to improve balance in chronic stroke patient.

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