

Optimizing the Function of Upstanding Activities in Adult Patients with Acquired Lesions of the Central Nervous System by Using the Bobath Concept Approach – A Case Report

Stjepan Jelica, Vesna Šeper, Erna Davidović and Gordana Bujišić

»Lavoslav Ružička« University of Applied Sciences, Vukovar, Croatia

ABSTRACT

Nonspecific medical gymnastic therapy may help patients after stroke achieve certain results in terms of efficiency but not in terms of quality of movement. The goal of treatment by Bobath concept is development of movement (effectiveness) and optimization of movement (efficiency). This article presents the case of a 62-year old patient who had experienced a stroke and has difficulties with standing up activities. It underscores the importance of not only recovery of function but also optimization of the function in such patients.

Key words: normal movement, bobath concept, optimization of function

Introduction

Complex movement (activity), such as standing up, consists of various components that are achieved through biomechanical structures. When conducting a normal movement hierarchical and parallel neural control are involved. Motor systems in humans have a hierarchical structure, with higher levels specifying increasingly complex motor actions. This hierarchy may be divided into three distinct brain regions: the motor areas of the cortex, the brain stem, and the spinal cord¹. Somatosensory information from receptors, proprioceptors, visual and vestibular systems helps and modulates motor behaviour. The role of parallel control in treatment allows the patient to receive the information needed for the movement and for the physiotherapist to influence hierarchical control and lead the movement using the facilitation and inhibition techniques in four different forms of peripheral sensory motor input, such as handling, verbal, different auditive and visual facilitation².

The aim of this report is to demonstrate the possibility of optimizing function after stroke using brain neuroplasticity phenomenon applying Bobath concept².

Case Report

The patient had a stroke on April 14th 2006, at the age of 62, and was hospitalized on Neurology ward from April 10th until April 21st 2006, where she was treated with nonspecific medical gymnastic therapy. Following the functional status assessment on 19th June 2006 some functional difficulties were observed such as standing up from bed (multiple attempts) followed by fear from falling. The work with patient started on June 19th 2006, it consisted of 25 one-hour daily treatments in patient's home using Bobath concept. International Classification of Functioning, Disability and Health (ICF guidelines)³

was used in order to analyze the problem and plan the treatment. The quality of standing up activity was analyzed through the appearance or absence of complex movement components and their quality. At the first treatment in June, she appears communicative, deals with current situation and limitations, and is willing to work.

Treatment has included facilitation of normal movement and inhibition of associated reactions, as well as automatization of components learned during the treatment⁴.

To automate the use of components being learned, the patient had to perform activities with purpose, which included standing up. To measure the improvement in movement quality Tinetti test⁵ was used. The maximum score on Tinetti test for balance is 16 points (Figure 1). Patients with less than 10 points are graded as patients with poor balance and coordination, and highly prone to falling.

Nine activities were graded (listed in order): sitting balance, rising (sitting to standing), attempts to rise, immediate standing (1st 5 seconds), standing balance, nudged (patient is in standing position examiner push lightly the sternum with palm 3 times), eyes closed (same position as previous), turning 360° and sitting down. Although patient scored only 9 points at the end of the last

treatment on July 21st 2006, a continuous improvement was observed for balance and coordination (Figure 1).

The overall improvement was made on the 2nd and the 3rd part of the Tinetti test- rising (sitting to standing) – 2nd part in Tinetti test and attempts to rise – 3rd part in Tinetti test, as well as sitting – 9th part in Tinetti test (Figure 2).

Discussion

Stroke is an acute or sub acute emersion of neurological symptoms caused by disturbance of arterial circulation in the brain⁶. This condition causes major or minor motor, sensory or cognitive deficiency. After stroke automatic patterns and operations are carried out more consciously and this leads to problems in achieving and maintaining accomplished position, as well as problems with muscle tension, balance and coordination⁷. Standing up as a complex activity consists of a number of components that occur in certain order and timing. The common goal of the patient and the physiotherapist is to abandon pathological movement patterns and to optimize selective usage of movement components when standing up, in order to reduce the risk of falling and make the movement more efficient¹. If the patient is in a relaxed, sitting position it is said that he or she is in a flexion set, which means that shoulders are in front of central key point – Th6, Th7. When trying to stand up from that position trunk and head flexion should occur as first component. The next component is pelvic inclination together with trunk extension as an anti gravity activity. The alteration of trunk flexion and extension is the most common problem for the patients. Together with these components, a passive external rotation in both shoulder joints occurs which allows for an efficient trunk extension. After the extension, extended trunk should maintain that position and flex in hips toward thighs in order to bring the trunk in center of gravity between the feet. When the center of gravity is achieved or nearly achieved, extension of hips and knees starts and brings extended trunk into upright position.

It is important to note that this analysis of standing up movement is actually a kinesiology analysis of the normal movement that does not include movement variations depending on influence of person's genotype and later phenotype⁶⁻⁸. Components of the movement do not occur separately – they overlap, and this proclivity, timing and apportion of each component makes the phenomenon of coordination and in the end an efficient movement.

The aim of the Bobath approach is function development – efficiency and function optimization – effectiveness through the quality improvement or facilitation of normal movement characteristics⁹.

Bobath concept is called neurodevelopment concept. It uses scientifically based facts as well as applied neurophysiology as the base for the treatment¹⁰.

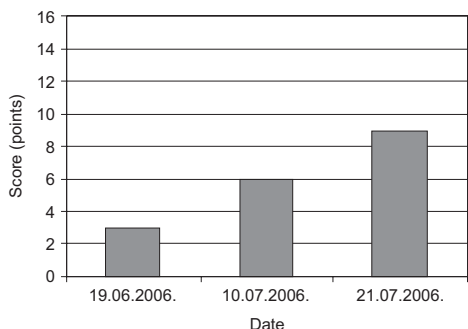


Fig. 1. Changes in score on Tinetti test measured before, during and after treatments.

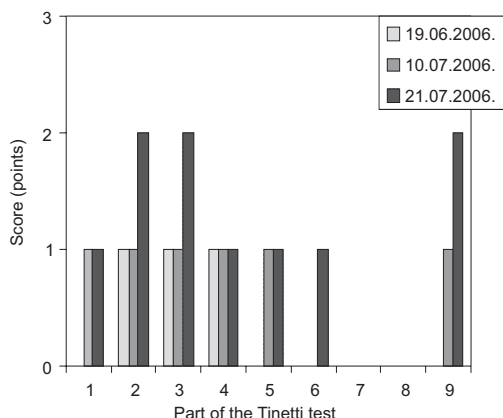


Fig. 2. Changes in score in particular parts of the Tinetti test measured before, during and after treatments.

Conclusion

Function optimization in this case was achieved through normal movement facilitation, which can be recalled in motor learning separately, but must be used automatically.

Facilitation, handling or hand guidance will help patient restore sense of muscle tension, posture and movement.

Concerning the level of physical and cognitive damage, cultural characteristics of the patient, motivation, degree of interaction, emotional and mental state, it can be concluded that movement restriction due to a stroke is not the ultimate outcome and patient's destiny. Function optimization can be achieved applying neurophysiologic principles of normal movement with active role of the patient.

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S. Jelica

»Lavoslav Ružička« University of Applied Sciences, Županijska 50, 32000 Vukovar, Croatia
e-mail: sjelica@vevu.hr

BOBATH KONCEPT U OPTIMIZACIJI FUNKCIJE USTAJANJA KOD ODRASLOG PACIJENTA SA STEČENOM LEZIJOM SREDIŠNJEG ŽIVČANOG SUSTAVA

SAŽETAK

Nespecifičnom medicinskom gimnastikom nakon moždanog udara pacijenti postižu određene rezultate u smislu efikasnosti ali ne i u smislu kvalitete pokreta. Ciljevi tretmana u Bobath konceptu su razvoj funkcije (efikasnost) ali i optimizacija (eficijentnost). Članak predstavlja slučaj pacijentice koja je u dobi od 62 godine doživjela moždani udar i imala problema sa ustajanjem. Rad naglašava važnost ne samo restitucije nego i optimizacije funkcije pokreta kod takvih pacijenata.