Case Report

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Task Specific Training for Upper Extremity in Stroke, a Case Report

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Abstract

Objectives: This case report addressed the idea about the effects of task specific training for improvement of upper extremity function in stroke.

Material and Methods: 50 years old female patient presented with right arm hemiparesis at Holy Family Hospital and she was assessed with action research arm test (ARAT), upper extremity functional independence measure (UE-FIM) and goniometry and treated with task specific training. Her range of motion and activities of daily living (ADLs) were limited. Task specific UE training was applied for 60 min/day, 4 days/week for 6 months.

Results: Task specific training was applied as intervention. Evaluation was performed Pretreatment and 6th month after the treatment. Patient improved on activity level outcome measure after 6 months.

Conclusion: Task specific training is cost effective treatment for improvement of upper extremity function in stroke.

Keywords: Task Specific Training; Upper Extremity; Stroke; Case Report

Introduction

Stroke is a leading cause of long term neurological disability [1] with majority of the people unable to use arm at 6 month due to impairment [2,3]. Upper extremity hemiparesis is one of the most common deficits after stroke [4]. Task specific training is a therapy in which patient perform specific goal directed motor task repetitively [5] in which focus is on functional task training not on muscle performance alone [6] and some sort of feedback is provided. Upper extremity task specific training usually involves an average of 32 repetitions of each task [7]. Repetitive task performance without specific skill learning is not sufficient for cortical reorganization [8,9]. Brain has ability to reorganize itself in response to demand imposed on it by external means which is known as neuroplasticity [10]. In task specific training repetitive performance of specific task reorganize motor areas surrounding the damaged area, surviving neurons make new synapsis, cortical mapping occur and motor and sensory function get restored or compensatory pattern develops [11-13]. This case report describes the treatment of upper extremity through task specific training and can be used as a mode of treatment of upper extremity hemiparesis.

History

50 years old female housewife presented in Holy Family Hospital, Rawalpindi with the complaint of decreased range of motion in right arm and decreased ability to do activities of daily life (ADLs) independently. She had a history of left sided stroke 4 months back resulting in right sided hemiparesis. On examination, all the ranges of right arm were markedly limited and patient has decrease ability to use it for functional task performance.

Physical Examination

Patient was evaluated with goniometry to check range of motion of right arm and Action research arm test (ARAT) and upper extremity functional independence measure (UE FIM) score to access the activity level. All ranges were markedly reduced, shoulder flexion was 40˚, abduction was 30˚, internal and external rotation was 15˚, elbow flexion was 40˚, Supination and pronation was 10˚, wrist flexion was 25˚, extension was 40˚, ulnar deviation was 10˚, radial deviation was 5˚ and thumb abduction was 20˚. To compensate for shoulder movements patient was using trunk, assessment was done with trunk restraint. Action research arm test is a highly reliable and valid 19-item tool (grasp, grip, pinch and gross movement) for activity based assessment of upper extremity [14]. In ARAT scoring is done from 0 (unable to complete) to 3 (complete with normal movement). On evaluation, patient score was 10 (moderate) which was much less than normal score of 57. UE FIM is another 18 item tool to assess independence in daily living, it scores five domains (eating, grooming, upper body dressing, lower body dressing, and bathing) [15]. Level of independence on UE FIM score varies

from 1 (complete dependence) to 7 (complete independence). On evaluation, patient score was 52 (moderate assistance was required to do ADLs) which was much less than normal value of 126.

Intervention

Task specific training was administered 60 min/day, 4 days/week [16] with 32 repetitions of each goal directed task for 6 months. On remaining 2 days, interventions related to ADLs were administered to address basic self-care deficit. ADLs tasks were also included in task specific training sessions. Patient was encouraged to use the paretic upper extremity for functional task performance outside the clinical setting. For example, patient was encouraged to use the paretic upper extremity to brush teeth, to answer cell phone, to brush hair, to pick up object from table and to eat food. Intervention strategies were modified and progressed to challenge the patient (for example, by changing patient position (sitting or standing), increasing the distance to reach and increasing the weight or size of the object).

Results

On post treatment assessment patient ranges were markedly improved, shoulder flexion was 80˚, abduction was 70˚, internal and external rotation was 30˚, elbow flexion was 90˚, Supination and pronation was 30˚, wrist flexion was 40˚, extension was 60˚, ulnar deviation was 20˚, radial deviation was 10˚ and thumb abduction was 40˚. ARAT score was improved to 30 (good recovery) and UE FIM score was improved to 98 (minimal assistance).

Discussion

Patient improved on functional outcome measure from baseline to discharge. Scores on ARAT were markedly improved from 10 (moderate) to 30 (good recovery). On post treatment assessment patient was more independent in self-care than on pretreatment assessment, UE FIM scores improved from 52 (moderate assistance) to 98 (minimal assistance) and even patient was able to do some task independently but under supervision. Several researches have reported improvement in functional outcome following task-specific training [17,18] Most upper extremity intervention researches report better functional outcomes in patients with less severe impairment, in contrast to them this case report suggest that even patients with more severe upper extremity impairment may make marked improvement in ADLs and ROM with an appropriate intervention. Specific Task was chosen and level of difficulty of each task was progressed in each session according to patient ability. This finding is noteworthy because it shows that the use of maximum repetition task specific training 6min/day, 4day/week for 6 months improved patient functional outcome. On post treatment evaluation, use of upper extremity was still limited but markedly improved.

Conclusion

This case report concludes that task specific training is cost effective treatment for improvement of upper extremity function in stroke. As expected, task specific training was effective on improving functional outcome measures. In future more researches need to be done to determine whether this technique results in better functional outcome than current upper extremity interventions.

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