VIII. STRESZCZENIE W JĘZYKU ANGIELSKIM

Stroke is the leading cause of disability and the second cause of death in the human population. Upper limb disorders concern 80% of patients in the acute phase. In the chronic phase, half of the sufferers will have a motor deficit and 5-20% will recover the entire upper limb function. For comparison, 80% of patients regain locomotion. This discrepancy may be explained by the complexity of structure and function of the upper limb, long and difficult upper limb recovery, no leading upper limb physiotherapy, and priority of verticalization and other skills, such as body rotation or locomotion. Upper limb rehabilitation after a stroke is a difficult and complex process. Physiotherapists do not spend enough time improving the motor skills of the upper limb (especially the hand). There are plenty of methods for upper limb rehabilitation, but there is no single leading and well-established one. Researches of adequately large patients' study and control groups of similar age and functioning are limited. International guidelines highlight the necessity of intensive and steady physiotherapy starting in the acute phase of stroke. The greatest improvement of upper limb function is observed in the early four weeks after the stroke, after which dynamics of recovery slowly decrease. Against this background it is reasonable to undertake the problem of upper limb physiotherapy, conduct research to broaden the knowledge of recovery mechanisms, and design an optimal method of physiotherapy.

Aims of study

1. Analysis of the most frequent deficits in dominant upper limb function after cerebral stroke.
2. Comparison of the dominant hand and whole upper limb function in patients after ischemic stroke after 10-14 days of physiotherapy by experimental therapy (study group) and conventional therapy (control group).
3. Comparison of the dominant hand and whole upper limb functions in study and control groups 12 months after ending hospitalization.

Materials and methods

The study was conducted in the Neurology Department of Medical University of Bialystok Clinical Hospital. The study involved patients after their first ischemic stroke in their life, at the age between 18 and 75, with paresis in the dominant hand and with the patient's consent. Patients with upper limb paralysis, behaviour deficits, and patients who cannot assume erect posture were excluded.

Neuropsychological research and Edinburgh Handedness Inventory were performed (by the neuropsychologist) with each patient as an entry criteria to this research. Patients were randomly divided into two groups: an experimental one, with experimental therapy of the upper limb, and a control one, with conventional therapy of the upper limb. Experimental therapy was designed by the author based on her own observations, experiences and the usage of current methods of upper limb physiotherapy. Both groups were similar in terms of the upper limb function based on the 17th task of the Wolf Motor Function Test Manual and the Nine Hole Peg Test. Each group was exercised twice a day for half an hour in the first 10-14 days of hospitalization. Afterward, patients were instructed by the physiotherapist to continue therapy at home. Patients were assessed with the Wolf Motor Function Test Manual and the Nine Hole Peg Test by an independent assessor in the first and in the last (10-14th) day of hospitalization. Patients were examined again twelve months later, but because of the Covid-19 pandemic examinations were performed via remote appointments. The appointment examination consisted of self-evaluation of individual functions of the patient, performed in a question-answer manner. A questionnaire used was a modified Wolf Motor Function Test Manual and a modified Nine Hole Peg Test.

Results

Study included 60 patients (21 women and 39 men) aged 37 – 75. The mean age of all patients was 65,57 (the median was 67). The mean age in study group with experimental therapy of hand was 65,23 (the median was 67), the mean age in control group with conventional therapy of hand was 65,9 (the median was 66,5). The study group consisted of 12 women and 18 men, the control group consisted of 9 women and 21 men. There were 58 patients with left brain hemisphere stroke and 2 patients with right brain hemisphere stroke. Study included 58 right – handed and 2 left – handed patients.

After twelve months 49 patients were evaluated (19 women and 30 men), 11 women and 14 men from study group and 9 women and 16 men from control group.

On the last day of hospitalization, 10-14 days after physiotherapy, statistically significant improvement of function in the dominant hand and whole upper limb was observed in the study and control group according to the Nine Hole Peg Test.

In the majority of tasks of the Wolf Motor Function Test Manual (tasks number 2–7, 9-10, 13-16) a statistically significant improvement of function in the dominant hand and whole upper limb was observed in the study and control group. In tasks number 1, 8, 11, 12, 17 statistically significant improvement was observed only in the study group.

After a period of twelve months after the hospitalization, in comparison to patients' condition, 10-14 days after hospitalization, in the Modified NHPT statistically significant improvement was observed only in the study group. No statistically significant improvement was observed in the Modified WMFT Manual 12 months after the hospitalization, in comparison to patients' condition 10-14 days after hospitalization in neither study nor control group. In tasks number 1, 3, 4, 5, 8, 12, 16 of Modified WMFT Manual no statistically significant improvement was observed in the study and control group 12 months after the hospitalization in comparison to condition 10-14 days after hospitalization. The aforementioned tasks involved shoulder and elbow joints without handgrips function (tasks number 1, 3, 4, 5), tasks involving Five Finger Pinch (tasks number 8, 16) – practiced in both conventional and experimental groups, a task involving Pulp Pinch or Tripod Pinch (task number 12). In tasks number 6, 7, 15, 17 of Modified WMFT Manual statistically significant deterioration of function was observed 12 months after hospitalization in comparison to condition 10-14 days after hospitalization in study and control groups. These tasks involved shoulder joint function, a task without handgrips function (tasks number 6, 7), tasks with Lateral Pinch (task number 15), and Hook Grip (task number 17). In tasks number 2, 9, 10, 11, 13 of the Modified WMFT Manual statistically significant deterioration of function was observed 12 months after hospitalization in comparison to condition 10-14 days after hospitalization only in the study group. There were tasks involving shoulder joint in adduction over 90^0 (task number 2) and tasks with hand grips (tasks number 9, 10, 11, 13), including precision grips.

Conclusions

1. After stroke, the most frequent deficits in the dominant upper limb were: pain and reduction of muscle strength in various parts of the upper limb, deceleration of movements, lack of hand accuracy and precision, sensory disturbance in hand and forearm, reduction of mobility and stiffness, especially in fingers.
2. Intensive experimental therapy of the dominant hand and whole upper limb, focused on daily living activities with particular reference to handgrip function, conducted in 10-14 days after cerebral stroke is more effective than conventional therapy.
3. Regardless of therapy used directly after cerebral stroke, ending regular physiotherapy causes a lack of improvement or deterioration of the majority of functions.
4. Patients with upper dominant limb dysfunction after stroke should continue regular supervision of a specialized physiotherapist after discharge from stroke unit.