

COMPLEX KINESITHERAPEUTIC APPROACH AFTER SUPRATENTORIAL UNILATERAL STROKE IN THE CHRONIC PERIOD

Ass.prof. Danche Vasileva, PhD Full Prof. Daniela Lubenova, PhD



Medical and social significance of stroke

Morbidity and disability



Mechanisms for functional recovery

Acute phase

processes take place on:
restitution (biological recovery of the brain lesion), adaptive reorganization (engagement of new synapses and neural networks) and / or compensatory
strategies (replacement behavior through re-training other than the normal response)

Chronic phase

there is a complex
bilateral reorganization
involving the more intact
side (respectively the
intact hemisphere).

Effect of kinesitherapy

Acute phase

Chronic phase

- Stimulates and promotes
 spontaneous repair of motor disorders.
- Stimulates compensatory behavioral strategies related to behavioral reorganization.
- It is used to train the non-damaged brain cells in the execution of certain functions.

The aim

The aim of the study is to evaluate the effect of the complex kinesitherapeutic approach and the specialized kinesitherapeutic method (SKTM) in patients with supratentorial unilateral stroke in the chronic period (SUSChP).



1. To develop a specialized methodology for kinesitherapy based on the modern principles of neurorehabilitation and adapted for home use in patients with unilateral chronic stroke.

Tasks

2. To study the early (10th day) and late (1st month) effect of the application of specialized kinesitherapy in patients with chronic hemiparesis, in comparison with the control group, which is the usual kinesitherapy, on:

(a) motor recovery functionalities;

- (b) equilibrium opportunities;
- (c) gait kinetic parameters;
- d) orthostatic reactivity.



3. To look for significant correlations between some permanent risk factors (gender, age) and stroke characteristics (limitation, localization and severity) on the effect of kinesitherapy.



1. Specialized kinesitherapeutic methodology (with 1 month duration);

2. Usual kinesitherapeutic methodology (with a 10 day duration)



The purpose of SKTM

Improving the functional capacity of patients with ischemic stroke in the chronic period.



Tasks

1. Improvement of muscle strength, spasticity and favorable influence on the motor capabilities of the patient.

2. Normalization of postural control in sitting and standing.

- 3. Positive influence on walking disorders and functional independence of the patient.
- 4. Improvement of orthostatic reactivity in patients with orthostatic intolerance.
- 5. Overall calming of the body after exercise. Speeding up the recovery processes and having a positive effect on the nervous system.

Methodological characteristics for practical application of the included movements









Training in rotating from occipital lay to side lying position

Moving from lying position to seat













Moving from bed to chair









Stimulating a reaction of a support

Movements in closed kinetic chain and facilitating







Movements in a semi closed kinetic chain and facilitating

Movements in open kinetic chain for upper limb





standing





Training in independent stance Moving from seated to

Seat with and without the support of the lower limbs



Training in standing position with weight transfer







Walking training

Comparative characteristics between SCTM and control methodology

The applied two kinesitherapy techniques are different in their duration of treatment, structure and included kinesitherapeutic agents (postural movements, walking, active upper limb movements and transfers).

SCTM adheres to the principles of modern neurorehabilitation and motor training, as opposed to conventional kinesitherapy. Methods for evaluating the treatment performed

- Chedoke-McMaster test to assess the severity of movement restrictions in (points)
- > Ashworth Scale for Muscle Tone Assessment (points)
- Functional independence measure (points)
- > Berg balance scale (points)
- Gait Study Cadance (number of steps) and speed (m / min)
- > Active orthostatic test



Statistical methods

- **1. Variation (Student-Fisher t-test),**
- **2.** Alternative
- **3. Correlation analysis**
- 4. Wilcoxon test
- **5. The Mann-Whitney U-test**
- **6. Paired Samples Test**
- 7. Spearman correlation analysis

Study contingent



- Supratentorial unilateral stroke
- Have mild or moderate residual, chronic hemiparesis
- Medication therapy should not be altered during motor therapy

Contingent

Including criteria:

- Do not have severe somatic diseases acute ischemic heart disease, respiratory failure, cardiovascular failure, uncontrolled diabetes mellitus, acute thrombophlebitis
- > Have no cognitive and memory impairment
- > No severe progressive neurological diseases
- Have given informed consent to participate in the study



Exclusion criteria:

- patients with acute stroke
- brain hemorrhages performed
- > presence of bilateral or severe pauses
- patients who refused to participate in the study for various reasons



Included in the study 67 patients with ISChP

Experimental group 56 patients Specialized kinesitherapeutic methodology

Control group 11 patients Usual kinesitherapeutic methodology

Contingent characteristics

| Indicators | Patients | Moderate degree | Easy degree |
|----------------------|----------|-----------------|-------------|
| Experimental group | n=56 | n=33 | n=23 |
| A <i>a</i> o | 62 2+0 0 | 62 0+7 4 | 62 2+40 0 |
| Age | 03.210.0 | 03.917.1 | 02.3110.9 |
| Sex (m / f) | 32/24 | 22/11 | 10/13 |
| Duration (m) | 7.8±2.01 | 8.3±2.2 | 7.2±1.5 |
| Localization (L / R) | 26/30 | 16/17 | 10/13 |
| Control group | n=11 | n=5 | n=6 |
| Age | 63.3±6.0 | 63.6±5.3 | 63.1±7.1 |
| Sex (m / f) | 9/2 | 5/0 | 4/2 |
| Duration (m) | 7.3±1.5 | 7.6±1.8 | 7.0±1.2 |
| Localization (L / R) | 5/6 | 2/3 | 3/3 |
| | | | |



Own results

Effect on the functionality of motor recovery

Chedoke-McMaster



Effect on the functionality of motor recovery

Ashworth



Effect on functional independence

Total number of points of FIM



Effect on balance capabilities

Total number of points - Berg



Effect on balance capabilities

Correlation dependencies



FIM

FIM

Effect on the kinematic parameters of gait







Effect on the kinematic parameters of gait



Changes in the percentage distribution of patients according to orthostatic reactivity



- The specialized kinesitherapy methodology developed and approved by us, continued later as a 1-month home exercise program, has a positive early and late therapeutic effect on the:
- functional possibilities for motor recovery,
- > equilibrium,
- gait and
- orthostatic reactivity

in patients with IS in the chronic period.

In contrast, the 10-day routine kinesitherapy had a short-term (up to 10-day) positive effect, and a 1-month follow-up showed a return to baseline.

2. The differences between the effects of the two compared kinesitherapy techniques seen at 1 month after application are related to differences in the duration of application, the structure of application, and the appropriateness of the kinesitherapy agents involved.

3. The positive early and late kinesitherapy effect depends on the severity of the disease and is independent of the gender, age, location and limitation of stroke.

4. The implemented specialized kinesitherapy improves the balance capabilities of the patients followed, which is associated with improved functional independence and gait during treatment..

5. Approbation kinesitherapeutic methodology, the need for daily adapted for home, purposeful physical activity to achieve lasting results and increase functionality in patients with IS in chronic period.





Thank you for your attention