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SCENAR-therapy in Ischemic Stroke Rehabilitation

Stroke is one of the main disabling diseases. According to statistical data of the Ministry of Health Care and Social Development of the Russian Federation and World Health Organization (WHO), the stroke incidence has risen greatly in recent years. However, after discharge from the hospital, patients rarely undergo rehabilitation, and if so, the measures are usually incomplete. The time of in-patient treatment has been reduced. After 21 day of in-hospital treatment, patients are discharged to be followed up by a district (regional) neurologist. However, regional outpatient clinics are often unable to provide adequate care to such patients due to lack of time, staff (rehabilitation and speech therapists, psychologists, masseurs etc.) and facilities.

This research is current as we suggest a new multiple approach to post-stroke rehabilitation, with SCENAR as a basic therapy.

SCENAR-therapy provides the following well-known effects:

Restoration of nervous connections and compensation of lost nervous connections (somatic component):
- ANS regulation
- Superficial sensation
- Deep sensation
- Body scheme
- Gross motor skills
- Fine motor skills

Recovery of cognitive functions:
- Gnosis
- Praxis
- Speech

Recovery of higher mental and behavioral functions
- Emotional component
- Behavioral component

Research objective – carrying out a clinical trial on using SCENAR-therapy as a basic therapy in post-stroke rehabilitation.

Tasks:
- Determine and evaluate practical effectiveness of SCENAR-therapy in rehabilitation.
- Develop most effective methods of SCENAR use.
- Work out guidelines on using SCENAR in post-stroke rehabilitation.

The patient population included post-stroke patients who had the disease for 3 months to 1 year and had no special rehabilitation care before.

All the patients had the diagnosis confirmed by neuroimaging and received in-patient care in a neurological hospital during the exacerbation.

43 people - 37 male and 6 female - have been examined and treated from 01.11.08 till 01.07.09. The patient age ranged from 45 to 75 years, mean age - 58.

To make a control group, we have examined 18 more people (male), who undergo conventional drug rehabilitation 'under the care of a district neurologist and therapist' and who have had ischemic stroke at the same time as those who received SCENAR-therapy. The age of people included in the control group corresponds to the target age of the therapeutic groups.

Treatment Design

Combination of SCENAR-therapy and corrective mechanical therapy in order to restore deep proprioceptive sensation and coordination of movements.

The patients were divided into 2 groups depending on the therapeutic strategies applied:

- Treatment of central zones only ('Collar zone', '3 pathways and 6 points'), head (comb electrode).
- Treatment of distal parts of the limbs and the head (comb electrode).

All patients received 12 sessions daily from a SCENAR-therapist, and then the treatment was continued at home with CHANS-SCENAR for 2 weeks (the sessions were given by family members using the guidelines provided by the doctor).

In addition to SCENAR-therapy, all patients received conventional drug therapy considering the severity of condition and coexistent pathology.

Control methods

In view of heterogeneity and small size of the total population, we used short statistical processing. Initially, therapeutic groups included the same number of patients but because of heterogeneous gender patterns and one out-of-order case, we have selected 18 patients in each group to be compared. So, we had 3 groups (18 people each): Central Techniques (Group 1), Peripheral Techniques (Group 2), and the Control (Group 3).

The patients were checked up twice – prior to the treatment and right after the treatment, that is 1 month after the initial check-up.

The following methods have been selected for control:

- Standard clinical and neurological examination with a detailed analysis of complaints and clinical presentations.
- Quality-of-life assessment on a 10-point visual analogue scale.
- 10 Words Test to evaluate short-term memory.
- Schultz tables for attention assessment.

Overall Findings

As a result, among all the patients treated, the condition has improved in 37 patients, 5 patients had no significant changes, and in 1 patient - aggravation (patient aged 75, thrombosis in the region of posterior cerebral artery caused by chronic heart failure (CHF), chronic obstructive pulmonary disease (COPD), diabetes mellitus, and multiple organ pathology).

Neurologic examination revealed an improvement in all patients of therapeutic groups, especially when compared with the control group. 2 patients recovered from motor alalia with lingual embol (which lasted for 7 and 11 months), both cases – from Group 2. Within groups 1 and 2, despite obvious improvement, no significant difference in neurological picture was found.

In the psychological test, significant difference was found between Group 1 (central techniques) and Group 2 (peripheral techniques); and a significant difference of the clinical picture

as compared with the control Group 3. The psychological data are summarized in the Chart and represented on Diagrams 1, 2, and 3 that follow.

Table 1(*Psychological data*)

		Central techniques (n = 18)		Peripheral techniques (n = 18)		Control (n = 18)	
		before	after	before	after	before	after
10 words	primary	**4.1** (±0.15)	**7.3** (±0.15)	**4.2** (±0.15)	**7.8** (±0.15)	**4.4** (±0.15)	**4.5** (±0.15)
	secondary	**3.5** (±0.15)	**6.3** (±0.15)	**3.3** (±0.15)	**7.0** (±0.15)	**3.7** (±0.15)	**3.6** (±0.15)
Shultz tables		**242** (±2)	**185** (±2)	**253** (±2)	**174** (±2)	**233** (±2)	**238** (±2)
Quality of life		**4.4** (±0,2)	**8.3** (±0.2)	**4.7** (±0.2)	**8.1** (±0.2)	**4.5** (±0.2)	**4.8** (±0.2)

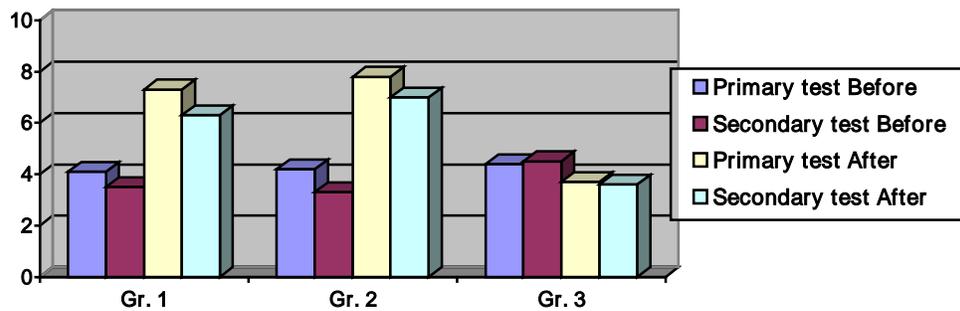*Diagram 1 10 Words Test*

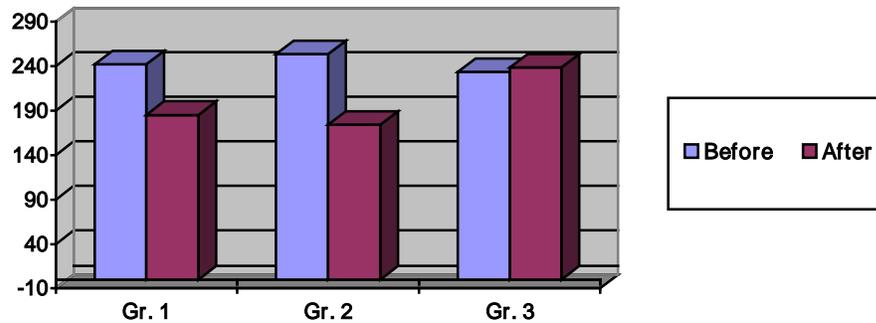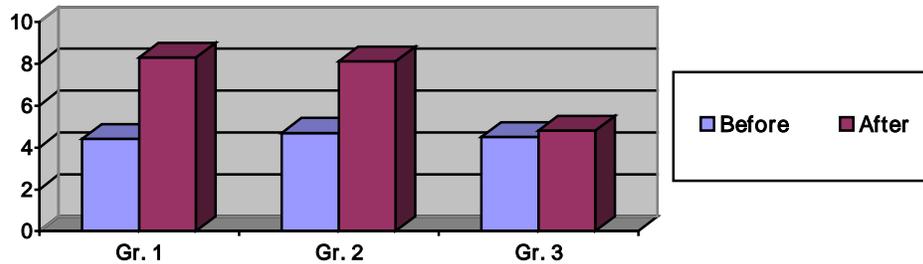*Diagram 2 Shultz Tables Test*

Diagram 3 Quality-of-Life Test

Discussion

      In therapeutic groups we achieved a significant neurological improvement that was also proven by neuroimaging. From objective neurological data, we cannot judge yet which is more advantageous – Central or Peripheral Techniques. To do so, we need additional instrumental research is needed and a more homogeneous population whose data can be validated. However, we can state with confidence that month-long rehabilitation that includes SCENAR-therapy is definitely far more effective than drug monotherapy.

      From psychological test data, Peripheral Techniques provide a more pronounced recovery of higher mental and cognitive functions, when used in rehabilitation after ischemic stroke. Nevertheless, Central Techniques also provide a significant effect as compared with that in the control group. To determine more clearly the tropism of the techniques to the patient's condition, a more extensive research is required.

      Such rehabilitation also improves the patients' quality of life, and decreases the level of depression and autoaggression. This allows recommending SCENAR-therapy for treating psychosomatic and psychological disorders accompanied by depression.

      SCENAR-therapy in multiple rehabilitation after ischemic stroke would allow to get highly optimistic results. Its therapeutic techniques are easy to learn and use. They can be safely advised to be used by nurses and paramedical personnel – psychologists, rehabilitation and speech therapists etc. Moreover, the treatment does not end in a therapist's office. Patients themselves can continue treatment with rather affordable, accessible and easy-to-use CHANS-SCENAR devices after appropriate training.

Conclusions

1. SCENAR-therapy can be used as a basic therapy for rehabilitation of post-stroke patients.
2. SCENAR-therapy can be used not only by medical professionals but psychologists, rehabilitation and speech therapists as well (since it improves the quality of psychosomatic therapy, restores speech and cognitive functions and promotes faster recovery).
3. Additional research and investigations are required, and treatment techniques should be improved.

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