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TREATMENT OF PERIPHERAL FACIAL PARALYSIS AS PART OF MOTOR NEUROREHABILITATION

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Abstract: The disease of the facial nerve (n.facialis) is in the first place among peripheral neuritis, both in terms of frequency and significance of functional dysfunctions and post-paralytic facial synkinesis can develop in any paralysis of the face and is associated with significant functional and psychosocial consequences for sick patients. The type and severity of nerve injury determine the degree of pathologic change, capacity for regeneration and prognosis for recovery. In the case of facial nerve neuritis, the greatest emphasis is placed on early detection, correct diagnosis of the damage and starting rehabilitation as soon as possible. In addition to drug therapy in the rehabilitation of facial nerve paralysis, the application of physiotherapeutic means, as well as acupressure, a technique from traditional Chinese medicine, has a significant place. Both basic concepts are holistic, with a comprehensive approach to the patient and the determination of treatments based on the differentiation of symptoms. The aim of the research is to analyze the impact of physiotherapeutic means combined with acupressure - a technique from traditional Chinese medicine, in patients with peripheral paralysis of the n.facialis with a moderate degree of functional disorder. Material and methods: Six patients (3 women and 3 men) diagnosed with peripheral paralysis of the facial nerve (4 left side / 2 right side) with a moderate degree of functional impairment are included in the study. For the purposes of the research, the following physiotherapeutic means were applied: thermotherapy, light therapy, electrotherapy - electrophoresis with Novocain and electrostimulation, therapeutic exercises and acupressure on the following points: Zanzhu (BL2), Yangbai (GB14), Taiyang (EX-HN5), Zygoma (SL18), Xiaguan (ST7), Yingxiang (LI20) and Yifeng (TE17). For the purposes of the research, a functional examination with a manual muscle test (MMT) for facial muscles and a test for the subjective feeling of pain is applied to all subjects at the beginning, during the therapies and at the end of the overall motor neurorehabilitation. Results: From the processed results, the influence of physiotherapeutic means in combination with acupressure in patients with peripheral paralysis of n.facialis with a moderate degree of functional disorder on muscle strength and pain intensity is observed and is most pronounced in the first month from the beginning of treatment. Discussion and conclusion: This is a complex research on physiotherapeutic possibilities combined with acupressure as part of modern motor neurorehabilitation to overcome muscle weakness, pain and asymmetry in patients with unilateral peripheral n.facialis. The presence of a positive change in the examined functional parameters is observed after the application of the combination of physiotherapy and acupressure and is most significant in the first month after the beginning of the treatments.

Keywords: physiotherapeutic means, acupressure, peripheral paralysis, facial nerve

Field: Public Health and Medicine

1. INTRODUCTION

The disease of the facial nerve (n.facialis) is in the first place among peripheral neuritis, both in terms of frequency and significance of functional dysfunctions, and post-paralytic facial synkinesis can develop in any paralysis of the face and is associated with significant functional and psychosocial consequences for sick patients.

According to many authors, the main etiological factor for Bell's palsy is viral infection and colds. About 25% of patients with facial neuritis may have persistent moderate to severe facial asymmetry, which has a very serious impact on patients' quality of life. Clinical manifestations are paralysis of the affected facial muscles (hypotonia, hyporeflexia, hypotrophy, fasciculations), enlargement of the eye fissure, inability to close the eyelids, disappearance of forehead lines and ptosis of the labial angle, pain in the ear area, hyperacusis, change of taste, hyperesthesia in the area of the ear and around it, dryness in the oral cavity.

The type and severity of nerve injury determine the degree of pathologic change, capacity for regeneration and prognosis for recovery. In the case of facial nerve neuritis, the greatest emphasis is placed on early detection, correct diagnosis of the damage and starting rehabilitation as soon as possible.

In addition to drug therapy in the rehabilitation of facial nerve paralysis, the application of physiotherapeutic means, as well as acupressure, a technique from traditional Chinese medicine, has a significant place.

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For thousands of years, Chinese medicine has summarized and accumulated a lot of relevant experience in the process of diagnosis and treatment.

Acupressure is a therapy from traditional Chinese medicine that uses stimulation of specific locations (points) on the patient's skin to achieve therapeutic results.

Both basic concepts are holistic, with a comprehensive approach to the patient and the determination of treatments based on the differentiation of symptoms. They are aimed at:

- improvement of blood flow and lymph flow on the affected half of the face.
- improvement of muscle tone and correction of muscle imbalance.
- improvement of nerve conduction and normalization of muscle strength.

2. MATERIAL AND METHODS

Six patients diagnosed with peripheral paralysis of the facial nerve with a moderate degree of functional impairment are included in the study.

Patients are selected according to several inclusion and exclusion criteria, to ensure homogeneity of the research:

- to be between the ages of 25 and 55;
- to be diagnosed with peripheral unilateral paralysis of n. facial,
- to be with stable hemodynamics (arterial pressure and pulse)
- to be without severe insufficiency of the cardiovascular and respiratory systems and
- to be without pronounced cognitive changes

The characteristics of the examined patients are shown in table. 1.

Table.1. Description of patients with peripheral paralysis of n.facialis

Number of patients – gender (women/men)	localization of paralysis left side / right side	Age	Duration of the problem
6 patients (3 w / 3 m)	4 / 2	43,8 ± 12,2	1 months

Source: Authors' own research Vasileva, D. and Zelnichka, I

Physiotherapy methods:

1. Thermotherapy (application method: sterile paraffin masks)
2. Light therapy - Ultraviolet rays and a Bioptron lamp that emits hyperpolarized light.
3. Electrotherapy - electrophoresis with Novocain and electrostimulation
4. Therapeutic exercises for:

- Improvement of blood flow and lymph flow on the affected half of the face. Apply: massage collar, relaxing face massage (on the healthy side) and toning massage (on the affected side).
- Improvement of muscle tone and correction of muscle imbalance. It is applied: treatment with position (the patient should lie on the affected side, which is previously raised) and massage.
- Improving nerve conduction and normalizing muscle strength. Analytical gymnastics is given according to the MMT grade:

• At grade 0, 1, 2 – include: exercises from a relaxed initial position (lying on the back), active exercises with assistance until symmetric with the healthy side, whereby assistance is performed after active muscle contraction, fixation of the healthy side after performing the movement , stimulating techniques – by touch or palpation.

• Above grade 2 – the exercises can be performed from a sitting position, instructions are given for independent performance of the exercises, massage, active exercises with a light load (resistance is given at the beginning of the movement and should not limit the possible range of movement).

5. Acupressure on the following points: Zanzhu (BL2), Yangbai (GB14), Taiyang (EX-HN5), Zygoma (SL18), Xiaguan (ST7), Yingxiang (LI20) and Yifeng (TE17).

Examination and assessment methods:

For the purposes of the research, a functional examination with a manual muscle test (MMT) for facial muscles and a test for the subjective feeling of pain is applied to all subjects at the beginning, during the therapies and at the end of the overall motor neurorehabilitation.

- Manual muscle testing

Manual muscle testing is a functional method of measuring muscle weakness. This facial muscle test has the following 4 grades:

Grade 3 – normal muscle strength and full range of motion
Grade 2 – partial movement, asymmetric of the unaffected facial muscles of the same name
Grade 1 – when trying to move, the muscle shows a slight visible contraction, which is not strong enough for movement
Grade 0 – when trying to move, the muscle does not show visible or palpable contraction

- **Subjective pain test**

The subjective pain test serves to measure the intensity of pain in the patient on a scale from 1 to 10, where score 0 indicates a feeling of no pain, while score 10 - the most pronounced pain..

Statistical methods:

A statistical program is used for quantitative processing of the gifts, where variation (Student-Fisher t-test) and alternative analysis are applied to generalize the changes from the applied treatment.

3. RESULTS

From the processed results, the influence of physiotherapeutic means in combination with acupressure in patients with peripheral paralysis of n.facialis with a moderate degree of functional disorder on muscle strength and pain intensity is observed and is most pronounced in the first month from the beginning of treatment.

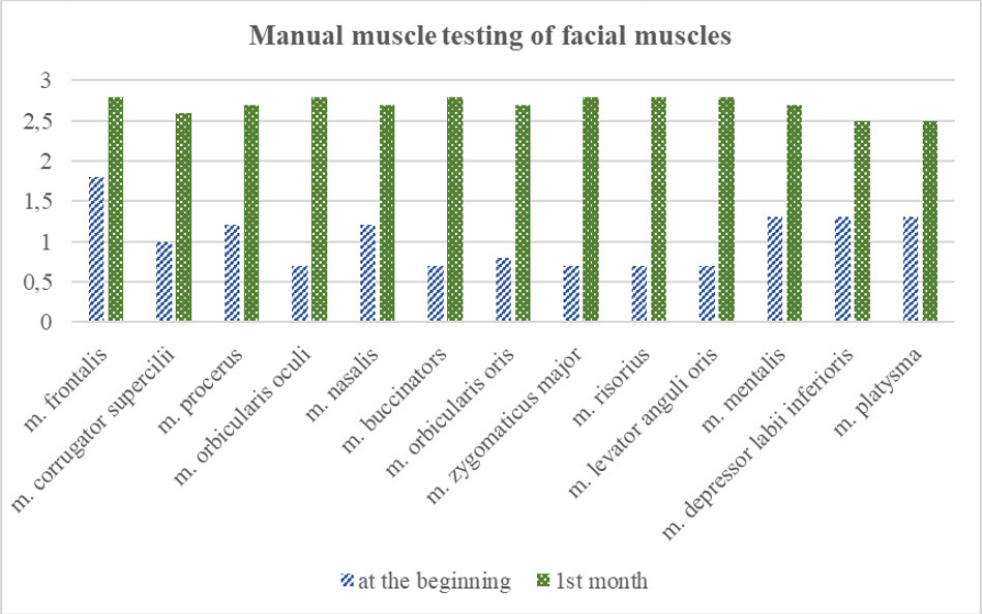
The results of the manual-muscle testing of the affected facial muscles and the changes in the values at the beginning and end of the physiotherapy treatment are shown in table 2, graph 1 and 2.

Tab.2. Presentation of the results of the manual muscle testing of the affected facial muscles

	at the beginning	1st month
m. frontalis	1.8±0.7	2.8±0.2***
m. corrugator supercilii	1.0±0.4	2.6±0.4***
m. procerus	1.2±0.4	2.7±0.2***
m. orbicularis oculi	0.7±0.5	2.8±0.2***
m. nasalis	1.2±0.4	2.7±0.2***
m. buccinators	0.7±0.5	2.8±0.2***
m. orbicularis oris	0.8±0.6	2.7±0.2***
m. zygomaticus major	0.7±0.5	2.8±0.2***
m. risorius	0.7±0.5	2.8±0.2***
m. levator anguli oris	0.7±0.5	2.8±0.2***
m. mentalis	1.3±0.4	2.7±0.3***
m. depressor labii inferioris	1.3±0.6	2.5±0.3***
m. platysma	1.3±0.6	2.5±0.3***

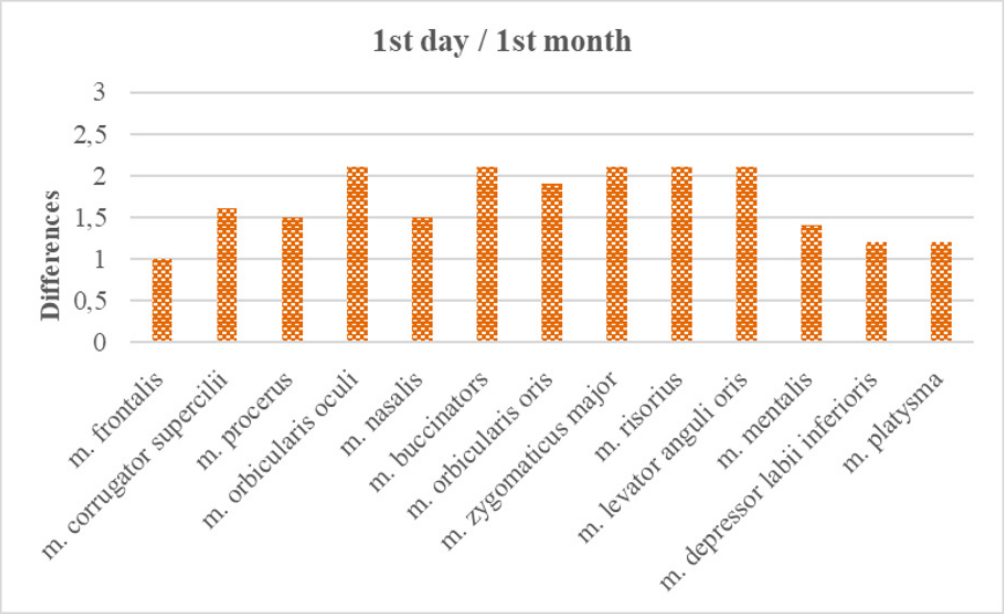
*** p<0,001 – significant changes in changes in manual muscle testing of the affected facial muscles
Source: Authors' own research Vasileva, D. and Zelnichka, I.

Figure 1. Presentation of the results of the manual muscle testing of the affected facial muscles



Source: Authors' own research Vasileva, D. and Zelnichka, I.

Figure 2. Differences in change values from manual muscle testing of facial muscles



Source: Authors' own research Vasileva, D. and Zelnichka, I.

The results of testing the subjective feeling of pain of the affected facial muscles and the changes in the values at the beginning and end of the physiotherapy treatment are shown in table 3, graph 3 and 4.

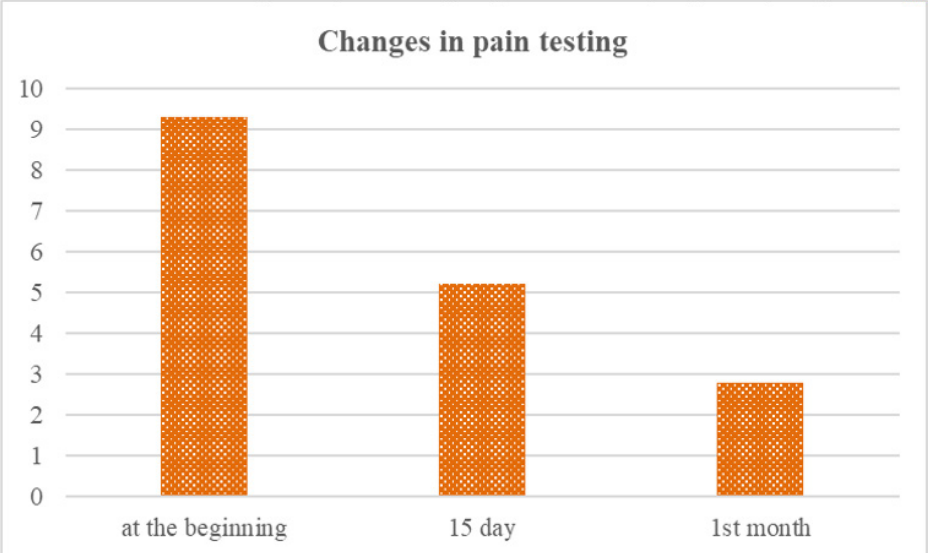
Table 3. Presentation of changes in pain testing in patients with peripheral paralysis of n.facialis

Parameter	At the beginning	15 day	1st month
pain	9.3 ± 0.7	5.2 ± 2.3 ***	2.8± 3.5 ***

*** p<0,001 – significant changes in changes in pain testing

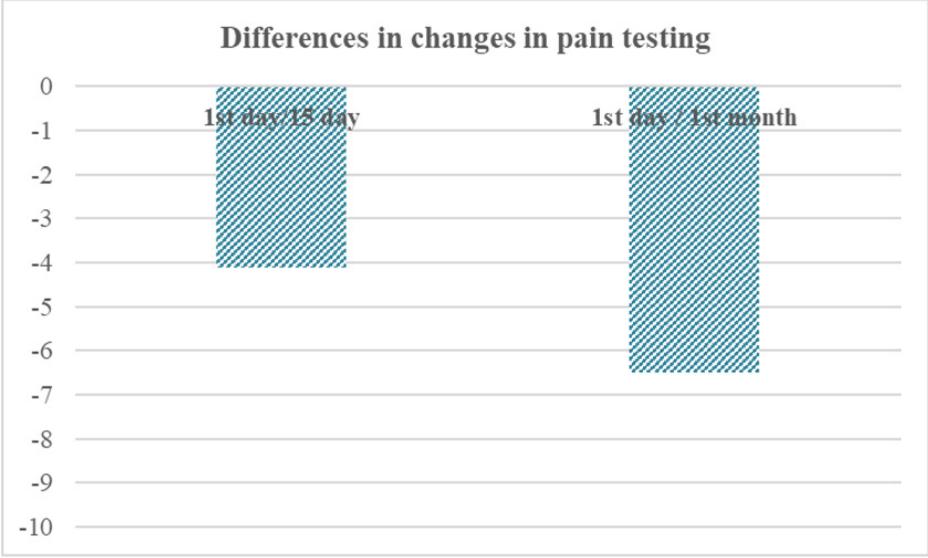
Source: Authors' own research Vasileva, D. and Zelnichka, I.

Figure 3. Presentation of changes in pain testing in patients with peripheral paralysis of n.facialis



Source: Authors' own research Vasileva, D. and Zelnichka, I.

Figure 4. Presentation of differences in changes in pain testing in patients with peripheral paralysis of n.facialis



Source: Authors' own research Vasileva, D. and Zelnichka, I.

4. DISCUSSION AND CONCLUSION

This is a complex research on physiotherapeutic possibilities combined with acupressure as part of modern motor neurorehabilitation to overcome muscle weakness, pain and asymmetry in patients with unilateral peripheral n.facialis. The presence of a positive change in the examined functional parameters is observed after the application of the combination of physiotherapy and acupressure and is most significant in the first month after the beginning of the treatments. Many studies show that the combination of proper

drug therapy, physiotherapy and acupressure are safe, useful and affordable therapies for patients with peripheral paralysis of n.facialis. It is more important that the overall results reduce the treatment time and the incidence of the consequences and complications that can occur as a result of this disease.

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