CASE REPORT

Клинический случай

Case Report / Клинический случай
УДК: 612.821
DOI: https://doi.org/10.38025/2078-1962-2022-21-5-129-139

Myofascial Facial Massage in Correction of Stress, Anxiety and Depressive Symptoms: a Case Report

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ABSTRACT

INTRODUCTION. At present, neuropsychiatric disorders are widespread among the population. Their occurrence is associated with the effect of chronic emotional stress. However, most people are not ready to seek help from a psychologist or psychotherapist. The original technique of decreasing the bioelectrical activity of facial muscles, developed and described in this study, can be an affordable and safe way to correct psycho-emotional states and, consequently, improve the aesthetic appearance.
AIM. To develop a modern method of correction of psychoemotional derivations, based on the use of neuromuscular relaxation techniques and the development of a facial feedback mechanism.
MATERIAL AND METHODS. The research methods included psychological, neurophysiological, and clinical-functional components that allowed assessing the psychoemotional status and electrophysiological parameters of the facial muscles.
RESULTS AND DISCUSSION. The results have shown a high efficiency of neuromuscular relaxation methods in the correction of psychoemotional disorders, which was manifested in reducing the level of depressiveness, situational and personal anxiety and increasing the bioelectric activity of the facial muscles, as well as the state of parafunction It have become possible to establish a clear correlation between the presence of severe depression and anxiety and increased electrical activity of the facial muscles, and the data obtained suggested that the use of neuromuscular relaxation techniques is an effective psychocorrective.
CONCLUSION: The method of neuromuscular relaxation is a new effective tool for diagnosing psychoemotional derivations and increasing the tonus of facial muscles by creating facial feedback.
KEYWORDS: stress, facial muscle, facial feedback, hypertonicity, myofascial face massage

For citation: Dubinskaya A.D., Yurova O.V., Fesyun A.D. Myofascial Facial Massage in Correction of Stress, Anxiety and Depressive Symptoms: a Case Report. *Bulletin of Rehabilitation Medicine. 2022; 21 (5): 129-139*. https://doi.org/10.38025/2078-1962-2022-21-5-129-139
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Received: Sep 05, 2022
Revised: Sep 30, 2022
Accepted: Oct 16, 2022

Миофасциальный массаж лица в коррекции симптомов стресса, тревоги и депрессии: клинический случай

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РЕЗЮМЕ

ВВЕДЕНИЕ. В настоящее время нервно-психические расстройства широко распространены среди населения. Их возникновение связано с воздействием хронического эмоционального стресса. По многим причинам большинство людей, когда они испытывают стресс или более серьезные расстройства, не готовы обращаться за помощью к психологу или психотерапевту. Оригинальная методика снижения биоэлектрической активности лицевых мышц, разработанная и описанная в данном исследовании, может стать доступным и безопасным способом коррекции психоэмоциональных состояний и, следовательно, улучшения эстетического внешнего вида.

ЦЕЛЬ. Разработать современный метод коррекции психоэмоциональных отклонений, основанный на использовании техник миофасциального массажа и разработке механизма лицевой обратной связи.

МАТЕРИАЛ И МЕТОДЫ. Методы исследования включают психологический, нейрофизиологический и клинико-функциональный компоненты, позволяющие оценить психоэмоциональный статус и электрофизиологические параметры лицевых мышц.

РЕЗУЛЬТАТЫ И ОБСУЖДЕНИЕ. Результаты исследования показали высокую эффективность методов миофасциального массажа лица в коррекции психоэмоциональных расстройств, что проявилось в снижении уровня депрессивной симптоматики, личностной и ситуативной тревожности, снижении биоэлектрической активности лицевых мышц и болевого синдрома. Полученные данные позволяют предположить, что использование техник миофасциального массажа является эффективным психокоррекционным инструментом, разрывающим порочную связь между длительным мышечным напряжением и негативным эмоциональным состоянием пациента.

ЗАКЛЮЧЕНИЕ. Метод нервно-мышечной релаксации является новым эффективным средством диагностики психоэмоциональных отведений и повышения тонуса мимических мышц за счет создания мимической обратной связи.

Для цитирования: Dubinskaya A.D., Yurova O.V., Fesyun A.D. Myofascial Facial Massage in Correction of Stress, Anxiety and Depressive Symptoms: a Case Report. *Bulletin of Rehabilitation Medicine. 2022; 21 (5): 129-139*. https://doi.org/10.38025/2078-1962-2022-21-5-129-139

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Статья получена: 05.09.2022
Поступила после рецензирования: 30.05.2022
Статья принята к печати: 16.10.2022

INTRODUCTION

At present, neuropsychiatric disorders are widespread among the population. Their occurrence is associated with the effect of chronic emotional stress. The WHO data shows that more than 300 million people worldwide are diagnosed with depression and more than 284 million people suffer from various types of anxiety disorders [1]. An increased tonic activity of muscle tissue can be called an indicator of mental stress at the physical level. This is a consequence of the activation of the sympathoadrenal system in response to mental stress. The mechanisms of facial expression depend on the mental state of the person – their functional state is associated with the neuropsychiatric state. That is why, according to observations, these muscles are more sensitive to emotional experiences than all the others [2-4]. Such emotional susceptibility is inherent in the masticatory (*m. masseter*), zygomaticus muscles (*m. zygomaticus*), orbicular muscle of mouth (*m. orbicularis oris*), and corrugator muscle (*m. corrugator*) [4-7]. Therefore, a number of authors call facial muscles "emotionally significant" or "valent-sensitive" [3, 8, 9]. Facial expression is mainly the result of stereotypical movements of the facial skin and fascia (connective tissue) due to the contraction of the facial muscles in certain combinations. Such contractions create folds, lines, and wrinkles on the skin and cause movement of markings on the face, such as the corners of the mouth and eyebrows. Although such factors as skin colour and sweating may contribute to some facial expressions, the most important aspects of most facial expressions are a direct result of muscle action. The facial muscles are not the only muscles that respond to emotions. Striatal muscles of the neck, back, arms, etc., also contract in response to emotions, as do the smooth muscles of the blood vessels and digestive tract. However, nowhere in the body are the emotions more clearly distinguished from one another than in the pattern of facial muscle tension.

There is a correlation between the activity of the facial muscles and the emotional state – they always interact with each other on the principle of facial feedback, which is confirmed by the research by scientists [3, 8-10]. The tonus of the facial muscles increases when a person experiences negative emotion. When the facial muscles remain tense for a long time, such processes as negative neuropsychiatric states only intensify. Therewith, persistent relaxation of the facial muscles through the afferent channels allows slowing these processes down and has a positive effect on the emotional background [11-14].

At present, specialists use botulinotherapy. This technique allows blocking afferent signals from the facial muscles to the emotional centres of the brain, thereby helping in the fight against depressive disorders [7, 15-17]. But, recently, there has been growing evidence that such invasive

methods can lead to impaired emotional reactivity, reduced emotional response, difficulty in processing the subtleties and tones of the emotional language and decreased sexual function [6, 12, 18]. For this reason, botulinotherapy has a controversial status – not all experts recommend its use. One of the non-invasive methods of working with depressive disorders and correcting the facial muscles hypertonicity are physiotherapy techniques (laser therapy, massage, oxygen therapy, magnetic therapy, Kinesio Taping, myogymnastics, acupuncture, as well as dental trainers). Notably, most of these methods are still prescribed for neurological diseases [19]. But when it comes to the signals associated with depressive and anxiety disorders in people who are physically healthy, the increased tonus of the facial muscles is already considered as a symptom and goes beyond medical care. However, muscle hypertonicity sometimes remains hidden. It rarely has a noticeable negative impact on the quality of life. It is diagnosed during cosmetic or dental procedures and a massage [20-22].

For obvious reasons, most people are not ready to seek help from a specialist psychologist or psychotherapist, experiencing stress or more serious disorders. In addition, these people are often in unconscious internal stress (anosognosia), cannot evaluate and describe their emotions (alexithymia), and the use of cosmetic massage is often caused by dissatisfaction with their own appearance. This is always associated with a general negative neuropsychiatric background. The author's technique of neuromuscular relaxation of the facial muscles, which has been developed and described in this study, can become an affordable and safe way to correct psychoemotional states and improve the aesthetic appearance.

AIM

To develop a modern method of correction of psychoemotional derivations, based on the use of neuromuscular relaxation techniques and the development of a facial feedback mechanism.

MATERIAL AND METHODS

To study the effectiveness of the neuromuscular relaxation method used to correct psychoemotional disorders, the authors presented a clinical observation and the results obtained during its use.

The patient K., 35 years old, came to the clinic complaining about aesthetic changes in her appearance. It was suggested that dissatisfaction with her appearance and the desire to correct aesthetic defects had been caused by a negative emotional background. Psychological testing, as well as neurophysiological and clinical functional diagnostics of the facial and cervical muscles were performed to analyze the psychological characteristics of the individual and the characteristics of the concomitant state of the facial muscles. According to the results of these studies, patient K. was offered a set of neuromuscular relaxation procedures. Life record: patient K. has a higher education, working as a high school English teacher. She often experiences emotional stress in the course of her professional activity. Divorced and is raising a 13-year-old son (perhaps the present marital status leaves a negative imprint on her self-esteem and encourages the desire to change her appearance). *Status praesens*: Patient K. is somatically healthy. Denies the presence of chronic diseases.

Psychological examination was carried out using the following methods:

1. Assessment of the subjective severity of depression on the Beck Depression Inventory [10]. The results were evaluated as follows: 0-9 points – no depressive symptoms, 10-15 points – mild depression (subdepression), 16-19 points – moderate depression, 20-29 points – severe depression (moderate severity), 30-63 points – severe depression.

2. Measuring the level of anxiety using the Ch. Spielberger's questionnaire modified by Yu. Khanin [10]. The study assessed the level of state and trait anxiety. The results were interpreted as follows: 0-30 points – low anxiety, 31-45 points – moderate anxiety, over 46 points – high anxiety.

The neurophysiological study included conducting interference electromyography on the "Neuro-MVP-Neurosoft" device. The degree of bioelectric activity of the muscles most actively involved in the manifestation of negative emotional states was evaluated: corrugator (*m. corrugator supercilii*), masticatory (*m. masseter*), depressor anguli oris (*m. depressor anguli oris*). Neurophysiological indicators of the facial muscles were evaluated using standardised methods of interference myography.

The first stage of the study was to monitor and record the results of facial muscles activity of the study participants in a state of relative rest. To ensure the continuity of the results and the correct interpretation, the authors of the study decided to use the standards of interference myography proposed by J. Clam (1990). The activity of the masticatory muscles is normally 0-3.1 mkV. With a low degree of tension, muscle biopotentials are recorded in the range of 3.2-5.2 mkV, an average degree of tension of 5.3-7.3 mkV, a high degree – 7.4-9.4 mkV, and a very high degree – more than 9.4 mkV. The activity of facial muscles is normally 0-5 mkV, the values of biopotentials 5-8.1 mkV indicate a weak degree of tension, 8.1-11.2 mkV – medium, 11.2-14.3 mkV – high, more than 14.3 mkV – very high.

The second stage of the study was the recording of data on voluntary muscle activity by the method of samples with maximum tension. The facial muscles, being in a state of chronic excitation, exhibit inappropriate parafunctional activity, which is recorded in the form of increased amplitude of fluctuations in electrical potentials. When studying the neurophysiological parameters of the corrugator muscle (*m. corrugator supercilii*), the patient was asked to contract eyebrows as much as possible; the depressor anguli oris (*m. depressor anguli oris*) – to lower the corners of the mouth (face of discontent); the masticatory muscle (*m. masseter*) – to clench the jaws as much as possible.

Clinical-functional diagnostics included an assessment of the degree of pain during palpation of the following areas: the postaural, parotideomasseteric, submandibular, superciliary ridge area, upper section of the sternocleidomastoid muscles, trapezius muscles (Fig. 1). Pain was evaluated on a visual-analogue scale (VAS) from 0 to 10 points, where 1 – no pain; 2-4 – mild pain; 5-7 – moderate pain; 8-9 – severe pain. Based on the severity of the pain syndrome, the overall functional state of the muscles was

evaluated. The absence of pain was regarded as a normal muscle tonus, pain from 1 to 3 points – as a weak degree of tension, 4-6 points – moderate tension, 7-9 points – high degree of muscle tension.

Fig. 1. *An assessment of the degree of pain in the submandibular area (left) and parotideomasseteric area (right) using palpation*

Caliperometric study. Measurement of the fold thickness in various areas of the face and the neck – parotideomasseteric, submandibular, buccal areas, the upper part of the sternocleidomastoid muscle was performed using caliperometry (assessment of the thickness of the skin and muscle folds on the head and neck area of the caliper) (Fig.2). The volume of myofiber directly depends on the degree of its contraction, and an increase in the volume of the skin-muscle fold shows specialists the presence of interstitial edema. Thus, its thickening can be used as an additional criterion to diagnose the dynamic pattern of the level of muscle tension before and after the study. The measurements were carried out twice, after which the average value of the data was displayed. The authors of the study chose this diagnostic method since caliperometry data makes it possible to measure the dynamic pattern of the level of muscle tension before and after the neuromuscular relaxation procedures and the severity of intercellular edema. A decrease in the thickness of the skin-muscular fold after the procedure indicates a pronounced drainage effect of the massage, which is achieved by increasing the rate of the lymphatic and venous outflow from the facial muscles.

Fig. 2. *Caliperometry in the parotideomasseteric area (left) and the upper section of the sternocleidomastoid muscles (right)*

The technique of neuromuscular relaxation included conducting a myofascial massage in the clinic, which was accompanied by the patient's homework on performing self-massage of the face and gymnastics for the neck. The duration of correction was 2.5 months. Myofascial massage was a procedure for inactivating facial muscle hypertonicity in accordance with the patent programme No. 2705237 "The Method of neuromuscular relaxation of facial muscles" according to the method "Revitonica" [23]. When correcting the increased tone of the facial muscles, the following techniques were used: ischemic compression, deep sliding palpation, pincer palpation, kneading. A total of 10 60-minute massage treatments were performed. The procedures were performed on a weekly basis (Fig. 3).

Fig. 3. *Conducting myofascial massage*

Training in face and neck self-massage was conducted under the guidance of an instructor according to the developed programme (Fig. 4). When performing the programme, the muscles of various parts of the head, neck, and chest area were affected. Self-massage training took place 2 times a week. The instructor conducted 20 classes of 90 minutes each. Warming up, kneading, softening, rubbing, stretching techniques were used as massage movements.

Fig. 4. *Training in self-massage of the face and neck by the method of Revitonica*

The complexes studied together with the instructor were repeated daily by the patient as homework, which were performed daily for 15-30 minutes 6 times a week (Fig. 5).

Fig. 5. *Self-massage of the face and neck using the method of Revitonica*

RESULTS AND DISCUSSION

Initial indicators of clinical and functional diagnostics parameters

While evaluating the initial indicators of the subjective assessment of the severity of depression on the Beck scale [10], a conclusion can be drawn that the patient had pronounced depressive symptoms. When assessing the psychological status, attention was drawn to a pronounced fatigue ("I cannot do anything because of fatigue"), as well as the internalisation of negative emotions and the inability to feel them ("I used to be able to cry, but now I cannot, even if I want to"). The patient had ideas of self-blame ("most of the time I feel guilty", "I blame myself for my actions all the time"), a decrease in the level of social and labour activity ("I hardly force myself to do anything"). Of particular importance was dissatisfaction with the appearance and the realisation that there were negative changes in it ("there were significant changes in my appearance that make me unattractive"). Other problems, such as concern for health, interest in sexual activity, sleep disorders, and satisfaction with life were not dominant.

When evaluating the results of the survey, the patient had a high level of situational anxiety. The patient noted that she almost always lacks self-confidence, she "feels defenseless", is not sure of her strengths and abilities: she assessed herself as "a failure", wanted to be "as lucky as others". Furthermore, emotional vulnerability and sensitivity were identified, as well as prolonged experience of negative emotions: "I am very worried about troubles, I cannot forget about them", "I take everything to heart". The pronounced level of anxiety was manifested in a low mood ("rarely in high spirits") and an unstable background ("often irritable"). During the survey, the patient was also found to have a high level of trait anxiety. The following features of the patient's personality were noted: she is extremely sensitive to external circumstances and worries for insignificant reasons: "I worry about nothing", "I am worried about

possible difficulties", "I feel constant anxiety, I think about errands and troubles" (Table 1).

Table 1. *Initial indices of psychological status (points)*

Indices of psychological status	Points
Subjective severity of depression	21
Situational anxiety	42
Personal anxiety	59

According to the initial data of the electromyographic study, patient K. was found to have a significant excess of the standard indicators of bioelectric activity of all facial muscles (Table 2). Thus, in the initial state, the tonus of *m. corrugator supercilii* on the right was 31.4 mkV, on the left – 25.2 mkV; the tonus of *m. masseter* on the right – 27.3 mkV, on the left – 6 mkV; the tonus of *m. depressor anguli oris* on the right – 57.0 mkV, on the left – 50.3 mkV. In addition, there was a significant excess of the tonus of the masticatory muscle on the right in relation to the tonus of the masticatory muscle on the left. The results of the electromyography of the masticatory and facial muscles are presented in Table 2.

Table 2. *Initial indices of facial muscle electromyography, test at rest (mkV)*

Facial muscles	Indices of electromyography (mkV)	
	On the right	On the left
m. corrugator supercilii	31.4	25.2
m. masseter	27.3	6
m. depressor anguli oris	57.0	50.3

The initial evaluation of electromyographic data for the maximum voltage samples for each muscle showed that the bioelectric activity of the masticatory muscle (*m. masseter*) was 11.35 mkV on the right and 2.25 mkV on the left (Δ = 11.37%). In the initial state, the tonus of *m. corrugator supercilii* on the right was 251 mkV, on the left – 151.5 mkV; the tonus of *m. masseter* on the right – 509.5 mkV, on the left – 147 mkV; the tonus of *m.depressor anguli oris* on the right – 853.5 mkV, on the left – 245 mkV (Table 3).

Table 3. *Initial indices of electromyography of the masticatory and facial muscles, test at a maximum tension (mkV)*

Facial muscles	Indices of electromyography (mkV)	
	On the right	On the left
m. corrugator supercilii	251	130
m. masseter	509.5	207.8
m. depressor anguli oris	853.5	131.5

Notably, patient K. demonstrated increased activity of the muscles of the right side of the face compared with the left side, which can be explained by various reasons, in particular, the habit of chewing or grinding teeth on the right side of the jaw or increased tension of the skeletal muscles on the right side of the body due to prolonged statokinetic loads during the working day.

When performing functional diagnostics, the patient had an initial high level of pain sensitivity on all the examined areas of the face during palpation (8-10 points). The obtained data on high pain sensitivity are consistent with neuromyographic indices, since a prolonged myofascial hypertonicity leads to an increase in the severity of pain and the pain sensitivity is a marker of the presence of muscle tension (Table 4).

Table 4. *Initial indices of the muscle pain sensitivity in various areas of face and neck (points)*

Palpable areas	Pain sensitivity level
Parotideomasseteric area	8
Postaural area	10
Submandibular area	9
Superciliary ridge area	9
Occipital set of muscles	10
Trapezius muscles	10
Pain in the lower part of the face (intraoral)	9

Sternocleidomastoid muscle	10

Caliperometry. During caliperometry (assessment of the thickness of the skin-muscular folds on the head and neck using a caliper), the thickness of the folds in various areas of the face and neck was measured – parotideomasseteric, submandibular, buccal areas, the upper section of the sternocleidomastoid muscle. The measurements were made twice, after which the average value of the obtained data was calculated. Caliperometry data are evaluated in dynamics, comparing the results before and after neuromuscular relaxation procedures (Table 5).

Table 5. *Initial caliperometry indices for various areas of the face and neck (mm)*

Measured areas	On the right	On the left
The volume of the skin fold in the parotideomasseteric area	38	30
The volume of the skin-muscular fold in the buccal area	30	30
Volume of the skin-muscular fold under the chin	24	
The volume of the skin fold above the upper section of the sternocleidomastoid muscle	20	26

Thus, in the patient K., who applied for cosmetology services, against the background of pronounced depressive symptoms of varying severity and a high personal anxiety, high indices of bioelectric activity and pain sensitivity of the facial and cervical muscles were observed.

Results of the influence of neuromuscular relaxation procedures on initial indices

When analysing the dynamics of the subjective assessment of the severity of depression on the Beck scale [10], there was a transition from a pronounced degree of depression (21 points) to its almost complete absence (4 points), which indicated the high effectiveness of the myofascial massage in correcting disorders of the psychoemotional state. When assessing the psychological status of the patient, significant positive changes were observed: the mood has increased – "I do not feel upset", "I get as much satisfaction from life, as before", "I am not crying more than usual", the mood became more steady – "now I am irritable not more than usual", confidence has increased – "I do not feel like a loser", "I am not disappointed in myself", ideas of self-accusation and guilt have disappeared – "I am not disappointed in myself", "I do not feel that I can be punished for something", "I do not feel guilty". The patient's state of somatic health did not cause anxiety – "I do not worry about my health any more than usual". Sleep, appetite, and interest in sex also did not inspire the patient with fears. The most important change that occurred in the psychological status of the patient is satisfaction with her appearance, which occured after the end of the procedures – "I do not feel that I look worse than usual".

When analysing the dynamics of state anxiety, a significant effect of the correction was also noted: the level of pe anxiety decreased from a moderate level (42 points) to a low level (29 points). A very important positive change was almost a complete absence of a sense of external threat – "nothing threatens me". The patient also notes positive changes in her emotional background: she "does not feel constrained, tense", "feels peace of mind", notes that she "became happy".

The analysis of the personal anxiety showed a fairly stable condition. The dynamics remained at a high level – over 46 points. Notably, situational anxiety explains the persistency of the individual's property of perceiving certain external factors and actions as threatening and experiencing anxiety in response to such situations. A slight decrease in this metric after neuromuscular relaxation may indicate the individual characteristics of the patient's mental organisation. The patient, who took part in the study, was recommended to see a psychologist to eliminate psychoemotional discomfort and correct anxiety disorders in the future. Figure 6 presents the dynamics of indices of the psychological status.

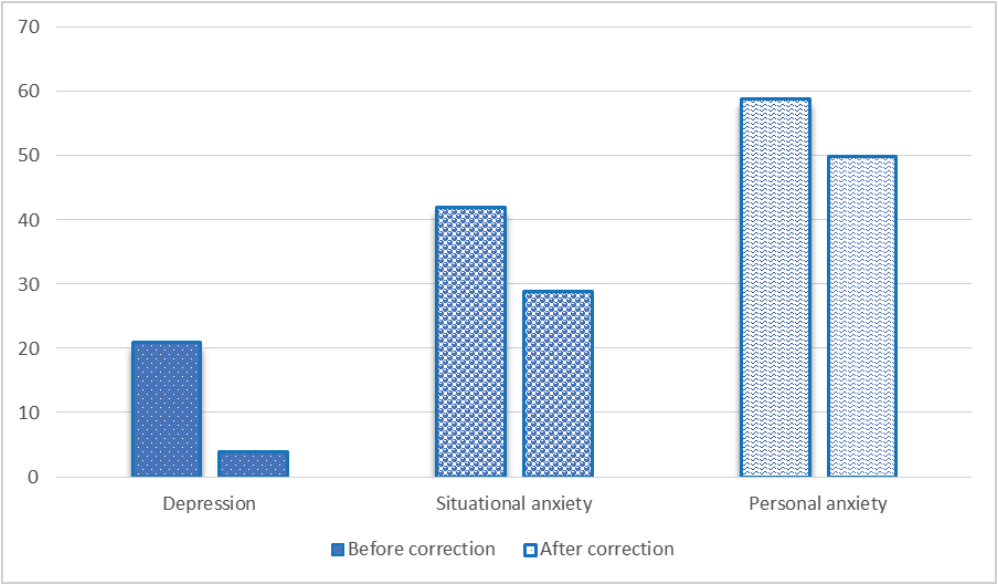

Fig. 6. *The dynamics of indices of the patient's psychological status*

Improvement of the psychological indices during the neuromuscular relaxation procedures was accompanied by positive dynamics of quality-of-life indices (Table 6). Thus, the resting electromyography indices were normalised and the muscle tonus on both sides was also normalised. This indicates the effectiveness of the method.

Table 6. *The Electromyographic Parameters of Facial Muscles before and after correction, test at rest (microvolts)*

Muscles under study	Electromyographic indicators (mkV)			
	On the right		On the left	
	Before	After	Before	After
m. corrugator supercilii	31.4	2.1	25.2	2.0
m. masseter	27.3	3.0	6	2.5
m. depressor anguli oris	57.0	2.5	50.3	2.2

When analysing the data of the electromyographic study of the facial muscles in maximum tension in patient K., a positive trend was established (Table 7).

Table 7. *The Electromyographic Parameters of Facial Muscles before and after correction, test at maximum tension (microvolts)*

Muscles under study	Electromyographic indicators (mkV)			
	On the right		On the left	
	Before	After	Before	After
m. corrugator supercilii	251	130	151.5	120.5
m. masseter	509.5	207.8	147	95.45
m. depressor anguli oris	853.5	131.5	245	140

There was a decrease in the parafunctional activity of all the studied facial muscles on the left and right sides. In addition, after the application of neuromuscular relaxation procedures, there was a more symmetrical muscle contraction on both sides of the face. Thus, the use of neuromuscular relaxation procedures has become an effective tool in correcting muscle tension in the facial and cervical muscles. Evaluating the indices of caliperometry (Table 8), the authors of the study recorded a noticeable decrease in the thickness of the skin fold after the neuromuscular relaxation procedures (in the parotideomasseteric and buccal areas on the right – by 52.6%, and on the left in the parotideomasseteric area by 33.3%, in the buccal area – by 52.6%, in the upper section of the sternocleidomastoid muscle by 23%). The volume of the skin-muscular fold in the submandibular area decreased by 41%. A pronounced asymmetry can be noted: the thickness of the skin-muscular fold on the right side was more pronounced than on the left side.

Table 8. *Caliperometry Indices on various areas before and after correction (mm)*

Measured areas	On the right		On the left	
	Before	After	Before	After
The volume of the skin fold in the parotideomasseteric area	38	18	30	20
The volume of the skin-muscular fold in the buccal area	30	18	30	18
The volume of the skin-muscular fold in the submandibular area	24		14	
The volume of the skin fold above the upper section of the sternocleidomastoid muscle	20	20	26	20

After the neuromuscular relaxation procedures, the level of pain decreased to a mild degree of tension (in the parotideomasseteric area – by 87.5%, in the postaural – by 80%, in the submandibular area – by 89%, in the superciliary ridge area – by 77.8% and in the sternocleidomastoid muscle – by 70%) and moderate tension in the occipital muscles – by 60%, in the trapezius muscle – by 60%, and in the lower face (intraorally) – by 44% (Table 9).

Table 9. *Pain Sensitivity Level before and after correction (points)*

Palpable areas	Before correction	After correction
Parotideomasseteric area	8	1
Postaural area	10	2
Submandibular area	9	1
Superciliary ridge area	9	2
Occipital set of muscles	10	4
Trapezius muscles	10	4

Pain in the lower part of the face (intraoral)	9	5
Sternocleidomastoid muscle	10	3

Consequently, the neuromuscular relaxation procedures caused a decrease in the severity of hypertonicity which is accompanied by a decrease in muscle pain during palpation. Thus, a decrease in pain can be considered a reliable indicator of a decrease in muscle tension.

Long-term results of the neuromuscular relaxation procedures were evaluated 4 months after the main study. During this period, the patient performed prophylactic self-massage of the face and neck exercises 2-3 times a week to maintain the result. As a result, patient K. maintained positive results in terms of the subjective severity of depression and situational anxiety. There was no depression (3 points on the Beck scale) and a low level of personal anxiety (33 points on the Spielberger-Khanin scale). The level of the personal anxiety remained unchanged (54 points on the Spielberger-Khanin scale) [10]. The presented clinical case sets one thinking about several points:

Firstly, the high tonic activity of the facial muscles was confirmed in a somatically healthy woman who sought help with cosmetic procedures. This fact is consistent with the study conducted by C. Le Louarn and co-authors, who confirmed the presence of high levels of facial muscle tension in healthy individuals using magnetic resonance imaging. Meanwhile, muscle hypertonicity remained hidden, without significantly impairing the quality of life of the patient and became a diagnostic finding in the course of the study [24].

Secondly, the patient was found to have a high level of depression symptoms during the study and a special state anxiety against the background of the increased muscle tonus of the facial muscles. This means that the link between emotional disturbances and facial muscle response has been confirmed by numerous predictions. For example, a systematic review of M. Wieckiewicz and co-authors say that from 2006 to 2016, almost 60 papers were published on the mental state of women complaining on pain in the masticatory muscles, of which 79% of studies were devoted to the relation of pain with depression, 42% – with anxiety, 21% – mood disorders [25] publications are related to the study of the corrugator muscle (m. corrugator supercilii) and its connection with negative emotional states (fear, anger, sadness) [2]. The correlation between the indices of technical activity of the facial muscles and the psychological state of a person was proved with the help of a study involving 151 women [26].

Thirdly, this clinical case illustrates the pronounced positive effect of neuromuscular relaxation of the facial muscles on the psychological state of a healthy woman, and this particular case is confirmed by a study conducted on a large sample [27]. A deep and differentiated method of working with the facial muscles with the help of myofascial massage provided not only the achievement of a therapeutic effect, but psychological as well. A decrease in the tonic activity of the facial muscles led to a persistent improvement in the emotional state. The performed massage resulted in the disappearance of the increased electrical activity of the masticatory and facial muscles at rest and at maximum tension, as well as to the almost complete disappearance of the muscle parafunction. The most significantly pronounced muscle spasm decreased in the *m. masseter*, which is the most sensitive to the effects of emotional stresses (the brightest trigger or "emotionally responsive" point). As a result of the correction, the patient's subjective severity of depression, state and situational anxiety decreased.

Fourthly, the direct participation of the patient in the correction helped to increase the interest and commitment to the implementation of the recommendations, thereby ensuring the achievement of a better psychological effect. The authors of this study believe that the effectiveness of correction is associated with independent exercises that were conducted at a conscious level and with a high degree of responsibility. Perhaps, myofascial massage, when combined with regular exercises, aimed to reduce muscle tension (self-massage of face and neck), contributed to a persistent muscle relaxation and breaking the vicious circle between the tonic activity of the facial muscles and the emotional centres of the brain, which, in turn, led to the stabilisation of the psychoemotional state. From this case, it follows that achieving a stable positive dynamic pattern for most indices of the psychological state against the background of improving the functional activity and tonus of the facial muscles when performing a set of neuromuscular relaxation procedures based on the facial feedback mechanism is effective.

CONCLUSION

Neuromuscular relaxation techniques provide a long-term positive effect of muscle relaxation and a reduction in the severity of somatic pain. The reduction of muscle hypertonicity and the reduction of pain response contribute to the registration of a new, anatomically correct position of the myofiber and a physiologically adequate pattern of muscle activity by the motor centres of the brain, which, according to the principle of facial feedback, ensures the restoration of the psychoemotional status, normalises the mood background, reduces the severity of anxiety and depression, increases the indices of physical and psychological health. The results of the study indicate that the course of myofascial massage, aimed at reducing muscle tension, complemented by independent practice, allows developing a new dynamic stereotype, which is fixed and supported by independent practice of self-massage of face and gymnastics for neck, leading to the stabilisation of the emotional state.

This clinical case illustrates the presence of certain hidden psychoemotional disorders, discovered after visiting the clinic for the correction of the aesthetic disorders of appearance. The severity of emotional disorders (the severity of depression, personal and sitoational anxiety) correlated with the presence of pronounced spasm of the facial and masticatory muscles and the muscle parafunction, which was confirmed by the data of electromyography and calyperometry. Emotional deviations were also combined with severe pain syndrome, which is a diagnostic indicator of muscle tension and hypertonicity. It became possible to establish a clear correlation between the presence of severe depression and anxiety and increased electrical

activity of the facial muscles. Hence, the data obtained allow concluding that the use of the neuromuscular relaxation techniques is an effective psychocorrective tool that breaks the connection between the prolonged muscle tension and the negative emotional state of the patient, which positively affected her psychological status.

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All authors confirm their authorship according to the ICMJE criteria (all authors contributed significantly to the conception, study design and preparation of the article, read and approved the final version before publication).
Special contribution:
Anastasia D. Dubinskaya – review of publications on the topic of the article, study design development, data analysis and interpretation, statistical data processing, and writing the text of the article;
Olga V. Yurova – study design development, data analysis and interpretation, study monitoring;
Anatoliy D. Fesyun – study design development, critical content review, scientific editing of the text of the manuscript, approval of the manuscript for publication.

Funding Source:
This study was not supported by any external sources of funding.
Acknowledgments:
Not applicable.
Disclosure:
Anatoliy D. Fesyun is a Director of the National Medical Research Center of Rehabilitation and Balneology and a Deputy Editor-in-Chief of the Bulletin of Rehabilitation Medicine The authors declare no obvious or potential conflict of interest associated with publication of this article.
Ethics Approval:
Not applicable.
Consent for Publication:
Consent of patient for publication (including not anonymized facial images) was obtained.

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