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Research Article

The Use of Biofeedback Training in Complex Treatment of Systemic Sclerosis Patients

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Abstract

Significant emotional problems, including anxiety and depression, which complicate the process of social and psychological adaptation, are characteristic of patients suffering from systemic sclerosis. Correction of the emotional status of patients with systemic sclerosis was carried out using biofeedback, based on the principle of self-regulation of body functions using external feedback systems. This method was developed in the framework of behavioral therapy and is currently being successfully used to treat psychosomatic diseases in combination with other medical and psychotherapeutic agents. We noted a significant decrease in anxiety and depression in patients during biofeedback, along with a significant effect of increasing the level of subjective control, which can contribute to improving the effectiveness of treatment of the disease and its prognosis.

Keywords: *Biofeedback; Systemic Sclerosis; Anxiety; Depression; Locus of Control*

Introduction

Systemic sclerosis (SSc) is one of the current problems in Rheumatology [1]. Diagnosis and treatment of this systemic disease, possibly described by I.S. Turgenev in the story "Living relic" (1874) from the series "Hunter's Notes" [2], still represents a challenge for any doctor, not only because of the involvement of many organs and systems in the pathological process, but also due to the existence of significant psychosocial problems that patients encounter. Their assessment and psychotherapeutic intervention in due time can significantly reduce the effects of psychological stress [3], providing better treatment adherence and improving the psychological well-being and patients' quality of life [4].

Psychological studies lead to a more complete understanding of the difficulties experienced by patients with SSc, and the development of additional treatment programs [5]. In this regard, scientific and practical elaboration for the use of new effective non-drug treatment and rehabilitation technologies for SSc, is aimed at improving the functional and adaptive capabilities of patients, and hence biofeedback training appears to be promising.

Methodology

90 SSc patients were taken under observation. The diagnosis of SSc was made after a thorough clinical and laboratory diagnostics of patients in accordance with the 2013 ACR/EULAR SSc Classification Criteria and the working classification of clinical variants of the course of SSc [6]. Patients were examined at admission and at discharge from hospital.

Criteria for inclusion in the study of patients were: oral consent of the patient; age from 18 to 70 years; established diagnosis of SSc. This study did not include patients with concomitant severe somatic pathology, severe intellectual and mental disorders, neuro-infections, traumatic brain injury consequences and other organic brain lesions.

The average age of patients was 38.19 ± 12.1 years. The average duration of the disease was 11.2 ± 3.4 years. All patients with SSc received a comprehensive drug therapy, which included antifibrotic, anti-inflammatory drugs, angio-protectors, and immunosuppressants.

Patients with SSc were divided into two groups randomly: the main (n = 60) and control (n = 30). Patient groups were comparable in gender, age and duration of the disease. Patients of the main group additionally received 12–14 sessions of multimodal BFB training with the help of the psychophysiological rehabilitation complex "Reakor" made by Medicom MTD (Taganrog, Russia).

Analysis of the effectiveness of BFB was carried out by studying the dynamics of the following psychological indicators and their comparison in patients of the main and control groups: personal (PA) and reactive anxiety (RA) levels (Spilberger-Khanin questionnaire) and depression (Beck questionnaire). The study of the level of subjective control was carried out according to the method of "LSC" (Bazhin EF., *et al.* 1987).

Results

A high level of personal (52.74 points) and reactive (53.11 points) anxiety was noted when studying the psychological status of patients with SSc.

High personal anxiety is manifested in patients' susceptibility to anxiety reactions, i.e. the tendency to perceive a wide range of situations as threatening and to react to these situations with anxiety, the intensity of which does not correspond to the objective danger. In behavior, this is manifested in features of self-doubt, hesitation, disposition to doubt in a situation of choice, increased self-control and self-criticism. Self-esteem in patients is complied with the formation of guilt and their own insolvency. In addition, there is increased lability, impressionability and reduced stress tolerance.

A high level of reactive anxiety is characterized by a feeling of internal tension, psychological discomfort, dissatisfaction with the life situation, and a change in overall perception. Taking into consideration the background of a reduced and unstable mood, a tense expectation of trouble, and a sense of uncertain threat are revealed. The behavior shows signs of fussiness, inconsistency and psychological constraint (neurotic overcontrol).

Dynamics of anxiety indicators in patients with SSc of the main and control groups during BFB training are presented in figure 1.

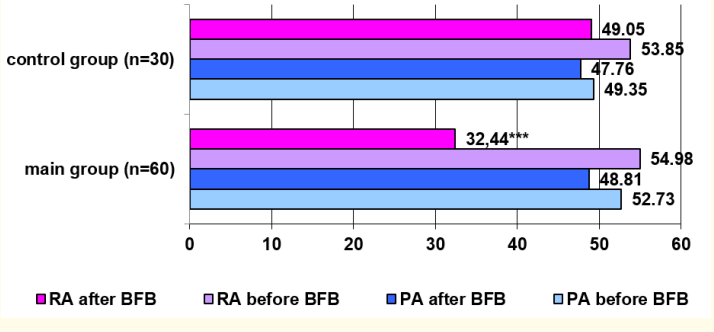

Figure 1: *Changes in the indicators of personal (PA) and reactive anxiety (RA) during BFB training in patients with SSc of the main and control groups.*

*Note: *: p < 0.05, **: p < 0.01, ***: p < 0.001.*

After the course of BFB, the severity of reactive anxiety decreased, however, this dynamic was significant only in patients of the main group.

The study of depression in somatic patients is given "exceptional social significance" [7] - its presence is among the adverse factors that negatively affect the course and prognosis of SSc and complicate the process of social and psychological readjustment of patients.

Moreover, the presence of an increased level of depression in patients with SSc was noted, and the therapy of depression should be considered as one of the priority areas of treatment for SSc patients.

After the course of BFB the level of depression decreased, however, this dynamic was reliable only in patients of the main group (Figure 2).

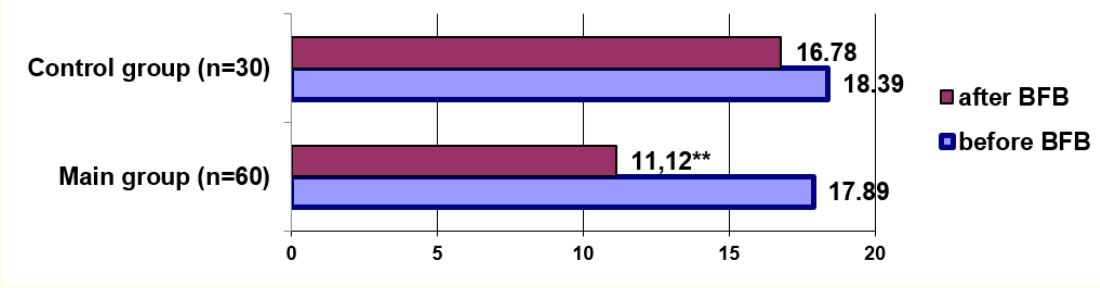

Figure 2: *Changes in the indices of depression during BFB training in patients with SSs of the main and control groups. Note: *: p < 0.05, **: p < 0.01, ***: p < 0.001.*

The integrative characteristic of the level of subjective control (LSC) is an immediate "target" for the impact of BFB training. The nature of the personal-environmental interaction of SSc patients has tendency to externality, especially in the areas of achievement, production, as well as in relation to illness and health, which predetermined increased psychological traumatization of patients with SSc in the disease.

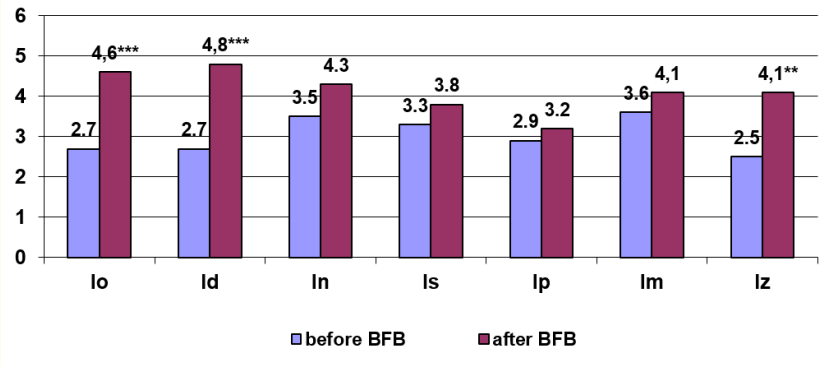

Figure 3: *LSC values in SSc patients of the main group before and after BFB. Note: *: p < 0.05, **: p < 0.01, ***: p < 0.001.*

As can be seen from the data presented, with the result of BFB training course, indicators of the level of subjective control underwent significant changes in all scales of the questionnaire. The use of BFB contributed to an increase of internality (increase of values) of patients with SSc on scales in the general sphere, sphere of achievements and attitude to the disease.

In patients treated with traditional therapy, the dynamic of LSC was similar, but unreliable.

Discussion

It is assumed that the use of BFB training contributed to the reduction of reflex myotonic syndromes, improvement of microcirculation, cerebral and peripheral blood flow, correction of emotional condition, mobilization of volitional potential and increase in patients' self-esteem. BFB offers the patient an opportunity to realize the mechanism of self-regulation. Some authors point to the fact that, one of the likely mechanisms of the therapeutic effect after BFB is the cognition and experiencing as well as in training of self-control skills, which, according to patients, they never felt before [8].

Thus, information about individual psychological traits on the personality of patients with SSc associated with the level of subjective control, has proven to be useful in cases of inadequate well-formed system of patient's responsibility for their health and need for its due change. With the help of BFB, patients acquire a sense of controllability of their disease, adhere more strictly to treatment regimen, and take responsibility for taking care of their health. Perhaps, this aspect lead to more effective results of the therapy, when not only the degree of change in the physiological parameter acts as a critical value, but also, a degree of patients' belief in his ability to control the symptoms of the disease.

Conclusion

The results of the studies indicate a positive effect of BFB training on affective disorders in patients with SSc that may contribute to the improvement and effectiveness in the therapy of this particular disease and its long-term prognosis.

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