Original Article

Combined physiotherapy of anxiety and depression disorders in dorsopathy patients

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Abstract:

The article presents results of treatment of dorsopathy patients based on a multilevel approach, combined with the psychophysiological correction of anxiety and depression disorders. Goal of the study: Development of protocols and research of the effectiveness of multilevel approach in psychophysiological correction of anxiety and depression disorders in patients with chronic diseases. Objectives of the study: 1. Development and optimization of protocols of evaluation of clinical manifestations and the level of anxiety and depression disorders in patients with chronic diseases. 2. Development of protocols of psychophysiological correction of anxiety and depression disorders in patients with chronic diseases. 3. Processing of statistical data and evaluation of effectiveness of multilevel approach in psychophysiological correction of anxiety and depression disorders in patients with chronic diseases. To determine the most effective treatment protocol of chronic patients, a group of 100 patients was gradually recruited in the Road Clinical Hospital №2 (Kiev, Ukraine), who were divided into 5 groups of 20 patients. Results of our research showed a positive dynamics of clinical manifestations in all patients groups. After analyzing the obtained data, it was found that through the combination of low frequency ultrasound therapy and magnetic laser therapy for dorsopathy treatment in conjunction with magnetic laser and electroneurostimulation of cerebral cortex with additional execution of endonasal breathing of singlet oxygen mixture, clinical manifestations of pain are reduced by 45-65% and the level of anxiety and depression is decreased almost by half. According to the SF-36, verifiable improvement in physical (PF), role physical (RP) functioning, general health (GH), vitality (VT), emotional functioning (RE), pain relief (BR) can be observed in all patients' groups, but to varying degrees. Reduction of muscular-tonic syndrome and especially of pain syndrome through the developed treatment complex leads to a significant improvement in the emotional state of patients to a lesser extent. Conclusions. Upon analyzing the obtained results, we found that the most effective treatment protocol is a combination of the topical impact with administration of analgesic agents - ultraphonophoresis combined with magnetic laser therapy. Additional combined correction of the anxiety and depression disorders based on the application of transcranial electroneurostimulation and magnetic stimulation at a frequency of alpha rhythm (9.4 ± 0.94 Hz) with simultaneous endonasal breathing of singlet oxygen mixture enhances the therapeutic effect of treatment and more effectively reduces anxiety and depression disorder. Further research of combined application of physiotherapy treatment protocols and psychophysiological correction of anxiety and depression disorders is essential to improve the efficacy of dorsopathy treatment.

Key words: magnetic laser therapy, psychophysiological correction, anxiety and depression disorders, dorsopathy.

Introduction

Triathlon Modern requirements for the implementation of medical treatment protocols of various diseases involve the need to use new technologies allowing to reduce the medication burden, to ensure maximum recovery of disruption of functional systems, accelerate the rehabilitation processes of socially significant diseases and improve the quality of life of patients. [1-3].

Goal of the study:

Development of protocols and research of the effectiveness of multilevel approach in psychophysiological correction of anxiety and depression disorders in patients with chronic diseases.

Objectives of the study:

1. Development and optimization of protocols of evaluation of clinical manifestations and the level of anxiety and depression disorders in patients with chronic diseases.

2. Development of protocols of psychophysiological correction of anxiety and depression disorders in patients with chronic diseases.
3. Processing of statistical data and evaluation of effectiveness of multilevel approach in psychophysiological correction of anxiety and depression disorders in patients with chronic diseases.

To determine the most effective treatment protocol of chronic patients, a group of 100 patients was gradually recruited in the Road Clinical Hospital №2 (Kiev, Ukraine), who were divided into 5 groups of 20 patients:

Group 1 - Treatment was carried out in accordance with the recommended treatment protocol (a combination of the topical impact with administration of analgesic agents - ultraphonophoresis combined with magnetic laser therapy).

Group 2 - Treatment was carried out according to the recommended protocol and additionally end nasal breathing of singlet oxygen mixture was performed.

Parameters of the procedure of breathing: device MIT-C, duration of procedure is 15 minutes. The treatment course consists of 12 procedures, the procedures were carried out 3 times a week.

Group 3 - Treatment was carried out in accordance with the recommended protocol and in addition, pulse micropolarization of the cerebral cortex was performed.

Parameters of procedure: The device MIT-EF2, the pulse repetition frequency is 9.4 ± 0.94 Hz, the pulse duration of 0.5 ms, the strength of current - until the light sensations of electrical current emerged, duration of one procedure is 15 minutes, the treatment course consists of 12 procedures, procedures are carried out 3 times a week. The electrodes of channel 1 are placed on the right side: electrode "+" is placed on the mastoid region, electrode "-" of is placed on the brow arch. Electrodes of channel 2 are placed the same way on the left side.

Group 4: Treatment was carried out in accordance with the recommended protocol; additionally, pulse magnetic laser therapy of cerebral cortex was carried out.

Parameters of procedure: device MIT-MT, pulse repetition rate is 9.4 Hz, magnetic field power is 30 ± 3 mT, power of optic flow of the red spectrum is 30 ± 6 mW, power of optic flow of infrared spectrum is 50 ± 10 mW, duration of procedure is 15 minutes, treatment course consists of 12 procedures, procedures are carried out three times a week. Magnetic laser applicator of red spectral range was placed on the area of glabellar arches of the patient. Magnetic laser applicator of infra-red spectral range is placed on the area of foramen magnum.

Group 5: Treatment is carried out on the basis of combination of methods of groups 1, 2, 3 and 4.

Treatment course consists of 12 procedures, procedures are carried out 3 times a week.

Position of a patient on the couch in the condition of decompression of the spine and an option for procedure implementation are shown in Figure 1.

Fig. 1. Position of a patient on the couch in the condition of decompression of the spine and an option for procedure implementation

The treatment was carried out on the basis of the methods proposed by sources [1,3]. The criterion for a patient to be included into the study group was a confirmed chronic disease and anxiety and depression disorder, as well as his informed consent to participate in the experiment.

At the moment, examination and treatment of 90 patients with a diagnosis of dorsopathies of lumbar spine was carried out. All patients were in outpatient treatment in the Hospital's Department of rehabilitation treatment and daytime inpatient care. The group consisted of persons aged 25-65 years, including 42 women and 48 men. Patients were randomly divided into five groups. At this time, patients are assigned to groups as follows: Group 1 has 19 patients; Group 2 has 17 patients; Groups 3, 4 and 5 have 18 patients each.

Model of the study included clinical and neurological assessment of patients, determining the intensity of pain on certain scales before and after treatment, dynamic general clinical tests; if necessary, rheovasography to determine the venous drainage of the lower limbs, magnetic resonance imaging of the lumbar spine.

To evaluate the clinical manifestations, J. Fairbank questionnaire for pain intensity, scale of assessment of the autonomic nervous system, scale of assessment of quality of life SF-36 and Visual Analog Scale (VAS) were used. To assess the level of anxiety and depression disorders, Becks' and Spielberg-Hanins' questionnaires were used [4,5].

The received data were processed with the help of Microsoft Excel, SPSS programs. To assess the existence of differences or dependencies between the parameters analysed do not measure used Chi-square test. In the studies assumes 5% error requesting and related significance level $p < 0.05$, indicating a statistically significant differences or depending on. In the statistical analysis Fisher's exact test is also used.

Results

Results of our research showed a positive dynamics of clinical manifestations in all patients groups. After analyzing the obtained data, it was found that through the combination of low frequency ultrasound therapy and magnetic laser therapy for dorsopathy treatment in conjunction with magnetic laser and electroneurostimulation of cerebral cortex with additional execution of endonasal breathing of singlet oxygen mixture, clinical manifestations of pain are reduced by 45-65% and the level of anxiety and depression is decreased almost by half. In this case, there is a more expressed positive dynamics of symptoms of autonomic dysfunction, decrease in pain and an increase in the duration of remission, which in turn helped to improve the quality of life of this patients' category. Using the SF-36 Survey allows to record and measure changes in patients' quality of life before and after treatment, as well as highlight the factors which to a larger extent affect the mental and physical components of quality of life, which can be adjusted through monitoring of patients.

According to the SF-36, verifiable improvement in physical (PF), role physical (RP) functioning, general health (GH), vitality (VT), emotional functioning (RE), pain relief (BR) can be observed in all patients' groups, but to varying degrees. Reduction of muscular-tonic syndrome and especially of pain syndrome through the developed treatment complex leads to a significant improvement in the emotional state of patients to a lesser extent.

According to the data provided, patients' quality of life verifiably improved as a result of the course of treatment, especially on the scale of pain sensitivity. This can be explained by the fact that the reduction in pain as a result of the treatment in patients significantly removes restrictions on the daily work, increasing the amount of work, improving the quality of work performance. Patients of Group 5 achieved the highest values, compared to other researched patients' groups. Dynamics of changes in data according to VAS are shown in fig 2.

Fig. 2. Dynamics of data changes on VAS

Note: correction to the inter-group parameters did not differ ($P > 0.1$); after the correction (the value of confidence > 0.1) $P < 0.01$; according to the criterion of the statistical evaluation of hypotheses χ^2 between groups: 1-2 ($P < 0.05$), 1-3 ($P > 0.05$).

Before treatment, the clinical picture was typical. The main symptom in patients with dorsopathy of lumbar spine is pain. Prior to treatment, all patients' parameters measured by VAS were similar in all groups of patients. As a result of physiotherapy treatment, subjective improvement according to VAS was noted by all patients. According to the data obtained, the best pain relief was achieved in Group 5.

Changes in the level of anxiety and depression disorder were evaluated based on the scale of situational and personal anxiety by Spielberg-Hanin and Beck. The survey results on the selected scales are shown in Figures 3 and 4, respectively.

Fig.3. Level of anxiety and depression disorder on Spielberg-Hanin's scale

Note: correction to the inter-group parameters did not differ ($P > 0.1$); after the correction (the value of confidence > 0.1) $P < 0.01$; according to the criterion of the statistical evaluation of hypotheses χ^2 between groups: 1-2 ($P < 0.05$), 1-3 ($P > 0.05$).

Fig. 4. Level of anxiety and depression disorder on Beck' scale.

Note: correction to the inter-group parameters did not differ ($P > 0.1$); after the correction (the value of confidence > 0.1) $P < 0.01$; according to the criterion of the statistical evaluation of hypotheses χ^2 between groups: 1-2 ($P < 0.05$), 1-3 ($P > 0.05$).

Conclusions

Upon analyzing the obtained results, we found that the most effective treatment protocol is a combination of the topical impact with administration of analgesic agents - ultraphonophoresis combined with magnetic laser therapy.

Additional combined correction of the anxiety and depression disorders based on the application of transcranial electroneurostimulation and magnetic stimulation at a frequency of alpha rhythm (9.4 ± 0.94 Hz) with simultaneous endonasal breathing of singlet oxygen mixture enhances the therapeutic effect of treatment and more effectively reduces anxiety and depression disorder.

Further research of combined application of physiotherapy treatment protocols and psychophysiological correction of anxiety and depression disorders is essential to improve the efficacy of dorsopathy treatment.

Compliance with Ethical Standards

Ethical standard.

The research related to human use has been complied with all the relevant national regulations, institutional policies and in accordance with the tenets of the Helsinki Declaration (<http://www.wma.net/en/30publications/10policies/b3/index.html>). The study protocol was approved by the Ethical Committee of National Medical Academy of Postgraduate Education [6].

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References

- Borenstein, D. (2000). Epidemiology, etiology, diagnostic evaluation and treatment of low back pain. Intern. Med. Journ, №1, P.36-43.
- Samosyuk, I.Z., Pashkovskiy, I.B., Samosyuk, N.I., Chukhraev, N.V., Kolesnik, K.E. (2004). Neuropathic, myofascial and tunnel pain syndromes (Clinical picture, diagnostics, medicated and physical therapy methods). Kiev. Scientific-Methodical Center Medintech.
- Samosyuk, I.Z., Samosyuk, N.I., Chukhraev, N.V., Chukhraeva, E.N. (2007). Pain syndromes (Clinical picture, diagnostics, medicated and physical therapy methods). Kiev: Scientific-Methodical Center Medintech.
- Chuhraev N., Zukow W., Samosiuk N., Danilova O. The role of psychological correction in discogenic dorsopathies treatment. Journal of Education, Health and Sport. 6(11):262-270. eISSN 2391-8306. DOI <http://dx.doi.org/10.5281/zenodo.166568>
- Samosiuk I.Z., Malyuta V.I., Chuhraev, N.V. (2016). Lechenie bolevykh sindromov. [Treatment of pain syndromes]. Vena. NMAPO im. P.L. Shupika, UO Fizicheskoy i reabilitacionnoj mediciny. 224 s. (In Russian).
- WMA Declaration of Helsinki - Ethical Principles for Medical Research Involving Human Subjects. Retrieved from: <http://www.wma.net/en/30publications/10policies/b3/index.html> (access 01.07.2015).