The Effectiveness of Complex Non-Pharmacological Treatment in Patients with Episodic Migraine and Neck Pain

Skuteczność kompleksowego niefarmakologicznego leczenia pacjentów z migreną epizodyczną i bólem szyi

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SUMMARY

Introduction: Comorbidities and co-occurring conditions contribute to the overall burden of migraine. Treatment co-occurring condition is an important part in providing optimal care.

Aim: To investigate the effectiveness of complex non-pharmacological treatment and impact it on daily activities and concomitant anxiety and depression in patients with episodic migraine and co-occurring neck pain.

Materials and Methods: We evaluated 56 patients with episodic migraine (with aura 18 and 38 without aura) and co-existing neck pain, 21 men, 35 women, age from 18 to 55 years. Examination including radiography of the cervical spine, visual analogue scale for the pain, "HIT-6", Beck Depression Inventory and Spilberger-Hanin's anxiety scale. The Kolmogorov-Smirnov test was used to compare the data.

Results: Patients were divided into two treatment groups: the first group of patients 28 patients received only the specified complex of manual therapy, second group - 28 patients underwent a set of manual therapy and acupuncture. After treatment in first group observed decrease of frequency and severity of migraine attacks and a reduce number of days with a headache, but level of anxiety and depressive manifestations less decreased. In second group was more significant reduce the intensity, duration and frequency of migraine, more significant dynamics of anxiety disorders and general well-being.

Conclusions: Non-pharmacological treatment neck-pain syndrome in patients with episodic migraine not only to be effective in symptomatic control of pericranial muscles tension but influence on decrease of frequency and severity migraine attacks. Adding acupuncture to manual techniques more significant reduce pain syndrome and psychological disorders that possible lead to reduce drug intake.

Key words: episodic migraine, neck pain, manual therapy, acupuncture

STRESZCZENIE

Wprowadzenie: Stany i choroby współistniejące przyczyniają się do występowania migreny. Leczenie schorzeń współistniejących jest ważnym elementem optymalnego postępowania.

Cel: Analiza skuteczności kompleksowego leczenia niefarmakologicznego i jego wpływu na codzienne czynności i towarzyszące objawy lęku i depresji u pacjentów z migreną epizodyczną i współwystępującym bólem szyi.

Materiały i metody: Analizie podano 56 pacjentów z migreną epizodyczną (18 z aurą i 38 bez aury) i współistniejącym bólem szyi, w tym 21 mężczyzn i 35 kobiet w wieku od 18 do 55 lat. W badaniu wykonywano RTG kręgosłupa szyjnego, dolegliwości bólowe oceniano w skali analogowej, a także pacjenci zostali poproszeni o wypełnienie następujących kwestionariuszy: skali HIT-6, skali depresji Becka oraz skali lęku Spilbergera-Hanina. Do porównania danych zastosowano test Kołmogorowa-Smirnowa.

Wyniki: Pacjentów podzielono na dwie grupy lecznicze: pierwsza grupa 28 pacjentów stosowała tylko określony zestaw elementów terapii manualnej, a druga grupa – 28 pacjentów – poddana była zarówno terapii manualnej, jak i akupunkturze. Po leczeniu w pierwszej grupie obserwowano zmniejszenie częstości i nasilenia napadów migreny oraz zmniejszenie liczby dni z bólem głowy. Natomiast w ograniczonym stopniu zmniejszył się poziom lęku i objawy depresyjne. W drugiej grupie stwierdzono bardziej istotne zmniejszenie intensywności, czasu trwania i częstotliwości migreny, a także dynamiki zaburzeń lękowych, z jednoczesną poprawą stanu ogólnego.

Wnioski: Niefarmakologiczne leczenie zespołu bólowego szyi u pacjentów z migreną epizodyczną nie tylko skutecznie kontroluje objawowe napięcie mięśni okołoczaszkowych, ale także wpływa na zmniejszenie częstości i nasilenia napadów migreny. Dołączenie zabiegów akupunktury do technik manualnych w większym stopniu zmniejsza objawy zespołu bólowego oraz występowanie zaburzeń psychicznych, które mogą prowadzić do ograniczenia przyjmowania leków.

Słowa kluczowe: migrena epizodyczna, ból szyi, terapia manualna, akupunktura

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INTRODUCTION

Migraine is a common and often disabling disease. The 2016 Global Burden of Disease data revealed that migraine was the second most disabling condition worldwide second only low back pain [1]. Comorbidities and co-occurring conditions (hereafter referred to as comorbidities) contribute to the overall burden of migraine. Diseases are said to be co-occurring if the same person has more than one disease. Comorbid and co-occurring health problems and also contribute to disease burden for persons with migraine and may lower health related quality of life and add to their economic burden [2]. Comorbidities and concomitant conditions of migraine were associated with different rates of risk of progression from episodic migraine to chronic migraine [3].

There are many overlapping findings in studies of myofascial trigger point in migraine or tension-type headache [4]. Several studies have demonstrated a high occurrence of active and latent myofascial trigger points and neck pain in migraine patients. Studies show that there is a significantly higher prevalence of active myofascial trigger points in migraine patients compared to healthy controls [5, 6, 7, 8, 9]. Understanding the association of migraine with other health conditions is an important part in providing optimal care. When a co-occurring condition is identified along with migraine, treatment now becomes more complex because there are two separate conditions to manage, and both conditions may be interrelated.

AIM

The aim of study to investigate the effectiveness of complex non-pharmacological treatment and impact it on daily activities and concomitant anxiety and depression in patients with episodic migraine and co-occurring neck pain.

MATERIALS AND METHODS

We evaluated consecutive 56 patients with episodic migraine (with aura 18 and without aura 38 patients) and co-existing neck pain, 21 men and 35 women, age ranged from 18 to 55 years (mean 36±7). Episodic migraine were diagnosed according to the International Classification of Headache – 3rd edition [10]. Duration of the disease ranged from 3 months to 15 years, a frequency of 4 to 7 attacks per month (average frequency of 5.4). Neck pain was assessed by reporting neck pain for more than 3 months and intensity 3 on the numerical scale of pain. Physical and neurological examinations were done in all patients. Appropriate investigation was performed in suspected cases. Patients with secondary headaches or other primary headache disorders were excluded. Radiography of the cervical spine with functional load was performed for all patients; as a result, severe degenerative-dystrophic changes in the spine, disc herniation and root compression phenomena were excluded. All of the patients presented with the muscle tonic disorders due to of various grade scoliosis of the cervical and thoracic spine (29 patients), functional blockade of the joints of the cervical spine (31 patients) accompanied by tension of pericranial muscles and reflex muscle-tonic syndromes of the cervical region (cervicalgia, cervicobrachial syndrome). A visual analogue scale (VAS) was used to evaluate the dynamics of the quantitative characteristics of the pain syndrome, according to which patients were assessing the intensity of the pain syndrome of a migraine attack in the range from 1 to 100 mm [11]. All patients evaluated filled out the Beck Depression Inventory (BDI), two subscales are distinguished in this technique: points 1-13 present the cognitive-affective subscale (CA) and points 14-21 present the subscale for somatic manifestations of depression (SP) [12]. To assess the level of personal anxiety the Spilberger-Hanin's anxiety scale was used [13, 14].

A quantitative assessment of the impact of the severity of subjective and objective symptoms of headache was carried out using the "Headache impact test" - "HIT-6" TM [15], which is a questionnaire that allows to determine the degree of influence of headache on the patient's daily activities. The number of points indicates the severity of the negative impact of a headache on a patient's life. The questionnaire consists of six questions with five possible answers for each one of them corresponding to a certain number of points.

All patients were examined three times: before treatment, after 2 and after 6 weeks.

All patients completed a headache diary for 6 weeks in order to track treatment progress. The diary was completed daily, irrespective of presence or absence headache. The headache diary was used to calculate headache frequency, calculated by dividing the number of days with headache by the number of the analyzed weeks (days/week).

Data were analysed with the SPSS statistical package (17.0 Version). Results are expressed as mean, standard deviation (SD) or 95% confidence interval (95% CI). The Kolmogorov-Smirnov test was used to analyze the normal distribution of the variables ($P>0.05$). The statistical analysis was conducted at 95% confidence level. A P value less than 0.05 was considered statistically significant.

RESULTS

All patients received medication for acute treatment migraine attacks accordance with the guidelines of the International Headache Society. The treatment program was compiled on the basis of the data of clinical, neurological and vertebro-neurological studies with the identification of trigger points. Non-pharmacological therapy aimed at lessening the tension of pericranial muscles, correcting postural muscle imbalance as well as eliminating myofascial trigger points included the following steps: eliminating muscular-dystonic, myodystrophic and myofascial disturbances by post-isometric relaxation techniques, myofascial and soft muscular relaxation techniques (soft tissue technique), ischemic compression of trigger points, acupressure, strain and counterstrain technique, release-effect and acupuncture. After completion of the therapy a set of individually selected therapeutic exercises was recommended for patients to maintain the state of the muscle corset and to let the muscles of the shoulder girdle relax when overstrained.

In order to achieve the set goal patients were divided into two treatment groups. The first group of patients consisted of 28 people (11 men and 17 women) who received only

the specified complex of manual therapy and conducted 10 sessions every other day. A second group of 28 patients (18 women and 10 men) underwent a set of manual therapy and acupuncture according to the generally accepted technique. There were no differences in age, gender and psychological disturbance between groups.

After treatment in first group patients observed a positive dinamic in the form of a decrease or elimination of painful muscular-tonic syndrome, a decrease in anxiety and depressive symptoms as well as a decrease in the frequency and severity of migraine attacks and a reduce number of days with a headache (Table 1).

As show in Table 1 after improve muscle-tonic disorders in patients decrease headache intensity, migraine attacks frequency and number days with headache. Thus, there were improvements in well-being, activity and mood, but level of anxiety and depressive manifestations less decreased to not reaching the normal level.

The dynamics of the evaluated indicators in the process of complex treatment with acupuncture are presented in Table 2.

As shown in Table 2 the dynamics of the psychophysiological status, severity of pain and the general well-being of migraine patients with complex non-pharmacological treatment with acupuncture was more significant in relation to both objective and subjective markers than in patients who only used manual therapy. The therapeutic efficacy of manual therapy and reflexotherapy for migraine is mediated by the pathogenetic mechanisms of its comorbidity with neck pathology. As a result of the complex use of manual therapy and acupuncture there is a more significant decrease in the intensity, duration and frequency of migraine, as well as a decrease in the number of days with a headache. During the treatment period, patients experienced 1-3 migraine attacks, 5 patients noted a significant improvement in their general condition as there were no migraine attacks at all.

Table 1. The dynamics of the pain severity during a migraine attack and psychophysiological indicators in the period between attacks with manual therapy in 1 group of patients with episodic migraine and neck pain

Index	Before treatment, n=28	After treatment, n=28	P
Pain intensity of migraine attack according to VAS (mm)	82,5±5.3	64,6±5,7	p<0,05
HIT-6 TM (scores)	60,0±1,8	52,3±2,4	p<0,05
Beck's Depression Inventory (scores)			
Overall score	11,8±0,7	11,6±0,8	p<0,05
Cognitive/affective subscale	9,7±0,6	9,1±0,8	p<0,05
Somatic subscale	2,7±0,7	2,8±0,7	p<0,05
Spilberg-Hanin's scale			
State anxiety	52,2±3,7	46,1±1,9	p<0,05
Trait anxiety	47,5±3,8	40,4±2,5	p<0,05
The frequency of migraine attacks in 4 weeks	4,9±0,7	3,2±0,5	p<0,05
The number of days with a headache in 4 weeks	10,4±1,5	8,2±0,9	p<0,05

Table 2. The dynamics of the severity of pain during a migraine attack and psychophysiological parameters in the interictal period during manual therapy and acupuncture in 2 groups of patients with episodic migraine

Index	Before treatment, n=28	After treatment, n=28	P
Pain intensity of migraine attack according to VAS (mm)	83,0±5,1	61,7±5,7	p<0,05
HIT-6 TM (scores)	58,5±1,9	46,9±2,2	p<0,05
Beck's Depression Inventory (scores)			
Overall score	12,4±0,8	10,6±0,6	p<0,05
Cognitive/affectictive subscale	9,5±0,8	8,5±0,6	p<0,05
Somatic subscale	2,8±0,7	2,1±0,4	p<0,05
Spilberg-Hanin's scale			
State anxiety	53,2±2,6	42,2±2,4	p<0,05
Trait anxiety	47,5±3,5	35,1±3,6	p<0,05
The frequency of migraine attacks in 4 weeks	5,4±0,6	2,5±0,6	p<0,05
The number of days with a headache in 4 weeks	10,9±1,4	6,2±0,7	p<0,05

Table 3. The dynamics of the severity of pain during a migraine attack and the effect of headaches on daily activity after 6 weeks the completion of the manual therapy and acupuncture course in patients with migraine

	1 group, n=28.			2 group, n=28.		
	patients performing individual gymnastics, n=10.	patients not performing individual gymnastics, n=18	P	patients performing individual gymnastics, n=12	patients not performing individual gymnastics, n=16.	P
Pain intensity of migraine attack according to VAS	64,7±5,1	71,2±5.4	p<0,05	61,5±5,4	67±4,8	p<0,05
HIT-6 TM (scores)	52,5±2,3	58,4±2,5	p<0,05	47,8±2,3	51.1±2,1	p<0,05
Beck's Depression Inventory (scores)						
Overall score	11,9±0,7	12,7±0,8	p<0,05	10,5±0,7	11,7±0,6	p<0,05
Cognitive/affectictive subscale	9,8±0,6	10,6±0,8	p<0,05	8,4±0,7	9,1±0,7	p<0,05
Somatic subscale	2,9±0,8	3,1±0,7	p<0,05	2,2±0,5	2,0±0,6	p<0,05
Spilberg-Hanin's scale						
State anxiety	46,7±2,1	49,9±2,7	p<0,05	43,4±2,0	47±2,5	p<0,05
Trait anxiety	40,9±2,4	45,7±2,5	p<0,05	35,9±1,9	41,2±1,5	p<0,05
The frequency of migraine attacks in 4 weeks	3,3±0,6	3,9±0,8	p<0,05	2,4±0,7	3,1±0,6	p<0,05
The number of days with a headache in 4 weeks	8,4±0,8	9,1±0,7	p<0,05	6,4±0,6	7,3±0,7	p<0,05

Apparently the impact of reflexotherapy techniques on not only on the peripheral but also the central mechanisms of the pain syndrome that led to a more significant dynamics of anxiety disorders, pain intensity and to a more pronounced improvement in the ovearall well-being.

After completing the course of complex therapy patients were recommended to perform individually assigned therapeutic exercises daily to maintain their muscle tone and relax the muscles of the cervicobrachial region during their overstrain. The results of the examination after 6 weeks treatment are presented in Table 3.

Results show that an individually selected set of physical exercises allowed us to save the results of complex therapy. The relaxation of the muscles of the cervicobrachial region reduces nociceptive afferentation and has a positive effect on the course of episodic migraine with tension of pericranial muscles. At the same time the severity of the pain syndrome of a migraine attack, the index of the headache effect on daily activity, the frequency of headache attacks and the number of days with a headache increased in the group of patients who neglected therapeutic exercises although they did not reach the level that was recorded before treatment.

DISCUSSION

The results study confirm the close pathogenetic linked of reflectory muscle-tonic cervical syndromes, trigemino-cervical complex, brainstem structures and emotional disorders, which mutually reinforce each other and affect the course of migraine.

The basis of the formation of the muscular-tonic syndrome lies in the mechanism of the "vicious circle" when the repeated muscle tension arising in response to emotional stress leads to its reflex tension (spasm). This to lead to increase excitability of nociceptive neurons in the structures of the central nervous system, including motor neurons of the anterior horns of the spinal cord. Prolonged tonic tension worsens the blood supply to muscle tissue, leads to muscle hypoxia, acidosis and the release of inflammatory mediators, which in their turn bind to the corresponding receptors on the membrane of the peripheral endings of muscle nociceptors and sensitize them. The appearance of painful myofascial trigger point further enhances the afferent flow of nociceptive impulses into the posterior horns of the spinal cord and other parts of the central nervous system. Chronic painful irritations alter the functional state of non-specific brain structures, as a result of which the ratios of nociceptive and antinociceptive systems can change and support the pathological process in the muscles. Muscle spasm becomes not only an additional source of pain but also forms a vicious cycle that sustains the chronification of pain [16, 17].

Our studies confirm that patients with migraine and neck pain with tension of pericranial muscles to have mood disturbance with severe anxiety and light depression. Given the neurophysiological relationship of emotional, as well as the dependence of the threshold of pain perception on the functional state of nonspecific brain systems, we can assume that on the one hand it is the development of painful muscular-tonic syndrome that aggravates the of anxiety and depressive disorders. It in turn adversely affects during migraine, and on the other hand, emerging and / or existing psychophysiological disorders and frequent migraine paroxysms

exacerbate the development of myofascial dysfunction of pericranial muscles. Based on these statements a decrease in the severity of muscle-tonic pain syndrome should reduce the emotional dysfunctions and the frequency of migraine attacks. The use of acupuncture in its turn can enhance the effectiveness by acting on nonspecific brain structures. Tension of pericranial muscles during migraine is a consequence of central sensitization, dysfunction of antinociceptive systems therefore non-pharmacological methods of treatment for patients with migraine are indicated for the treatment of comorbid conditions (anxiety-depressive disorders, muscular-tonic dysfunction of the neck and shoulder region) hence preventing the chronification of the underlying disease and reducing the risk of medication-overuse [18, 19].

CONCLUSIONS

Our study demonstrate that non-pharmacological treatment neck-pain syndrome in patients with episodic migraine not only to be effective in symptomatic control of pericranial muscles tension but influence on decrease of frequency and severity migraine attacks. The use of individually selected physical exercises allows to relaxation muscle tension, reducing nociceptive afferentation from the muscles of the cervico-shoulder region that reduce influence of headache on the patient's daily activities. Adding acupuncture to manual techniques in migrainous patients with neck pain more significant reduce pain syndrome and psychological disorders that possible lead to reduce drug intake.

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