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Efficacy of craniosacral therapy in tension-type headaches in adult patients

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Abstract

Introduction: Headaches are a common health issue. The second most common type of headache is the tension-type headache (migraine-type headache is the most common type). Tension-type headaches are often referred to as stress-related or psychogenic headaches. Tension-type headaches often correspond with feeling unwell, and with depression or anxiety. Often they are drug resistant. This means that the treatment process may require patients to consider lifestyle changes. Patients seek other treatment types than pharmacotherapy and consider more holistic approaches, for instance natural medicine, breathing exercises or traditional Chinese medicine. The literature presents relationships between craniosacral therapy and headaches of various etiology, yet relatively few studies have been conducted on this matter. This study provides an additional insight into this therapeutic method. The aim of this study was to establish whether craniosacral therapy can reduce pain.

Material and methods: The study involved 30 adult patients. There were 22 women (73.3%) and 8 male patients (26.7%). Their mean age was 30.13 ± 5.33 years. The treatment used the Upledger's 10-step protocol and sessions were performed four times within a two-week period.

Results: Prior to the treatment, the mean HIT-6 scale pain intensity was 62.67 ± 4.65 points. After the treatment, pain intensity reduced to a statistically significant level of 48.43 ± 9.45 points. We found that pain reduction was greater in patients with higher BMI. The gender or age of patients did not affect the results.

Conclusion: Craniosacral therapy is an efficient pain reduction method in patients with tension-type headaches.

Keywords: headache, therapy, cephalgia, craniosacral therapy

Introduction

A large proportion of population suffers from headaches. Headaches are a complex issue, and they affect biological, psychological and social aspects of everyday functioning. Everybody suffers from at least one type of headaches at a certain stage of life [1]. Tension-type

headaches are the second most common type of headaches (following migraines). There are no attacks (as in migraines). They are also called as psychogenic, stress-related, common or related to increased muscle tension. They are not aggravated by physical activity. They are idiopathic, pressing, often bilateral, can affect the occiput or both temporal lobes. They constitute 69% of primary headaches.



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Tension Type Headache (TTH) is the most common type of primary headache. Most patients experience episodic TTH, and only in a fraction of patients this type of pain lasts for most part of their lives and is resistant to treatment. This type of pain can be found in every age group, yet it is most common in middle aged patients. Statistics show that TTH incidence is rising. Women have twice as high incidence of TTH as men. As they have tremendous impact on well-being and everyday functioning of patients, and as TTHs often result in sick leaves, their social and economic impact is discussed increasingly often. TTH is usually located outside the skull, and is accompanied by pain and/or stiffness of the neck and often of the shoulders. There are relationships between tension type headaches and stress, depression, strong emotions, tiredness, short sleep and anxiety [2,3]. The literature and clinical practice offer numerous types of treatment – from pharmacotherapy, through manual therapy, to alternative and natural medicine therapies. Still, it is believed that resistance to therapy is a significant characteristic feature of TTH [4]. Craniosacral therapy is a type of common treatment methods used in TTH. Numerous studies, and evidence based practice show that it leads to significant pain reduction, better wellbeing and future pain prevention. Craniosacral therapy is based on constant pulsation, known as a craniosacral rhythm, of the cerebrospinal fluid in the system of the sacrum – the dura matter – the skull. Delicate touch allows the rhythm to regain its initial power. Through a complicated system of bones, muscles and fascia it may transport onto all the structures of the body. The craniosacral therapy is based on the assumption that each human body has compensatory mechanisms that can be mobilized. Regulating circulation of the cerebrospinal fluid is an impulse that allows for releasing of internal forces of the human body [5–7].

The aim of the study was to assess efficacy of craniosacral therapy in adult patients with tension-type headaches.

Material and method

The study involved 30 patients seeking therapy for tension-type headaches. There were 22 women (73.3%) and 8 men (26.7%) in the group. The mean age of the

subjects was 30.13 ± 5.33 years. The age of the subjects was between 22 to 46 years. Their body height was between 158 to 188 cm, and their mean body height was 171.83 ± 7.55 cm. Their body mass was between 52 kg and 86 kg, and their mean body mass was 66.13 ± 9.58 kg. Their BMI was between 18.69 kg and 28.08 kg/m², and their mean BMI was 22.36 ± 2.59 kg/m² (Table 1).

Normal weight had 24 subjects (80.0%), and that 8 subjects (20%) were overweight, on the basis on their BMI.

The University Senate Ethics commission approval no. SKE 01-31/2019 was obtained. Each patient had four therapeutic sessions within the period of two weeks. The sessions used the techniques of craniosacral therapy according to Upledger's 10-step protocol (each technique is performed manually with the pressure of approximately 4 grams). During the therapy, the patient was fully dressed, lying on their back, the therapy was pain-free.

The criteria for subject inclusion were: age between 18 and 65 years, history of tension-type headaches, informed consent to participate in the study and in the therapy.

The criteria for subject exclusion were: age below 18 years and over 66 years, headaches of a different type than TTH, pain of the cervical spine, injuries to the head or the neck, stroke.

The study was conducted in a specially designated patient-friendly room, equipped with a treatment table and a chair.

Following techniques of craniosacral therapy were conducted:

1. Craniosacral rhythm still point induction technique. It is achieved through lifting both lower limbs. The therapist takes hold of the feet at the area of the heels. The therapist lifts both limbs by approximately 15 cm over the bed, applying gentle internal rotation. The therapists holds the position for approximately 30 seconds.
2. Releasing connective tissue of the chest and the abdominal cavity. The therapist takes hold on the level of lower ribs. The patient inhales and during the inhalation the therapist gives resistance, not allowing for a full expansion of the ribs. When the patient

Tab.1. Demographic data

	Descriptive statistics							
	N	\bar{x}	Me	Min.	Max.	Q1	Q3	SD
Body height [cm]	30	171.83	170.00	158.00	188.00	167.00	177.00	7.55
Body mass [kg]	30	66.13	65.00	52.00	86.00	58.00	74.00	9.58
BMI [kg/m ²]	30	22.36	21.50	18.69	28.08	20.11	23.88	2.59

exhales, the therapist moves with the diaphragm deeper dorsally. The sequence is repeated three to four times, and on the following inhalation the therapist lets go of the hold.

3. Frontal lift. The therapist places the index and the middle fingers of both hands on the level of parietal ridges, and the 4th and the 5th fingers on the zygomatic processes of the frontal bone. The 2nd and 3rd fingers gently press dorsally and then 4th and 5th fingers press medially and lift anteriorly until a clear release and lift of the frontal bone.
4. Parietal lift. The therapist places their thumbs on the bregma, and 2nd, 3rd and 4th fingers on the parietal tubers. With the thumbs, the therapist gently compresses caudally, while simultaneously lifting the parietal bone with the three fingers of both hands in the cranial direction until the clear release on the temporal-parietal suture.
5. Sphenobasilar compression-decompression. The therapist places their thumbs on the greater wings of the sphenoid bone, 2nd and 3rd fingers on the temporal squama and on the zygomatic processes of the parietal bone; 4th and 5th fingers on the level of mastoid processes of temporal bone, frontally from the mastoid suture. The therapist follows the movement of the flexion and extension of the sphenoid bone. If there is dysfunction of this structure, the therapist takes hold longer, facilitating the movement, until the feeling of release and the sphenoid bone flexion movement.
6. Mobilizing the temporal bone. The therapist takes hold with the left hand on the occiput with their 2nd to 5th fingers held together, at right angle to the head-neck junction on the transverse axis. The right hand picks the auricle and softly pulls it dorsally and laterally until the flexible movement can be felt on the temporal bone. This technique is conducted on both temporal bones – change of the handholds.
7. Temporal decompression. The therapist picks both auricles with thumbs and index fingers and gently pulls them posteriorly, caudally and laterally until the release.
8. Temporomandibular joint compression and decompression. The 2nd and 3rd fingers are placed on the temporomandibular joints under zygomatic bones. The therapist gently presses medially and pushes caudally the mandible off the joint until the release.
9. Suboccipital inhibition – dura mater release. The therapist places both hands under the occiput, the 2nd to 4th fingers directly on the suboccipital muscles on the C0-C1 junction on the medio-lateral axis. The therapist inhibits the suboccipital muscles with the fingertips until they substantially release.
10. Fourth ventricle compression (CV-4). The therapist places their hands on one another so that they form a V-shape, with thumbs touching one another. The thumb thenars are placed behind the mastoid processes of the occiput, the foramen magnum between the lateral aspects of the thumbs. The therapist compresses gently by bringing the thumbs nearer each other. The feeling of pulsation/ temperature increases. The therapist lets go of the compression and delicately pulls cranially. Again, there are cerebrospinal fluid movements until the release.

All the above mentioned techniques are non-invasive. The choice of methods was based on their efficiency according to Upledger [8], as well as on the therapist's (KD) 5-year clinical experience, completion of 1st and 2nd level craniosacral therapy courses by Upledger, as well as osteopathy studies, including cranial osteopathy modules .

The effects of the study were assessed with the HIT-6 questionnaire before and after the therapeutic cycle. HIT-6 is a popular questionnaire used for evaluating headache intensity. It comprises of six question. There are five possible answers for each question and each answer can score 6/ 8/ 10/ 11/ 13 points, respectively. The higher the score, the more intense the pain syndromes [9].

Statistical analysis

The software package Statistica 10.0 by StatSoft was used to conduct the statistical analysis of the collected data. Both parametric and non-parametric tests to analyze the variables were used. We used parametric tests if its basic assumptions were met, i.e. if the studied data distribution was normal distribution – this was verified with a test. To assess differences in the mean level of a numeric variable in two populations, we used the Student t-test for independent variables or alternatively – the non-parametric Mann-Whitney U-test. We determined the correlation of two variables of normal distribution with the Pearson's linear correlation coefficient. For variables which did not meet the criteria of normal distribution, we calculated the Spearman's rank correlation coefficient. Statistical significance was set at $p < 0.05$.

Results

HIT-6 headache intensity scores among the participants were measured prior and after the therapy. Before the therapy, the mean headache impact was 62.67 ± 4.65 points on the scale and after the treatment the mean value of the headaches experienced decreased to the mean of 48.43 ± 9.45 points. The difference between the first

and the second measurements on the HIT-6 scale was statistically significant ($p < 0.001$). The mean change in headache impact between these two measurements was 14.23 ± 9.78 points (Table 2).

The effects of variables such as age, body height, body mass and the BMI on the intensity of pain as expressed on the HIT-6 test before and after the treatment and the difference between the two measurements were evaluated. Statistically significant differences were found between the measurements before and after the treatment, or the effect of the therapy, and the body mass and the BMI of the participants ($p = 0.038$ and $p = 0.046$, respectively). Both correlations were positive. This means the increase of one variable resulted in an increase of the other variable. The higher the mass of the subjects and the higher the BMI were – the greater was the difference in two consecutive measurements. Both correlations were moderate ($R = 0.38$ and $R = 0.46$, respectively) (Table 3).

It was found no statistically significant differences between the HIT-6 scores before and after the treatment, and the effect of therapy, and participants' gender ($p > 0.05$) (Table 4).

Discussion

The study involved patients suffering from tension-type headaches. Approximately two thirds of the subjects were women.

Before the treatment, the mean impact of the patients' headaches in the HIT-6 test was 62.67 points – this was approximately 80% of the maximal score in the test (the maximum score is 78 points). This value reflected the intensity of pain in relation to the greatest pain, expressed as 100,0%. In the time following the treatment, the headaches reported by patients decreased to the mean value of 48.43 points on the HIT-6 test,

Tab. 2. HIT-6 scores before and after therapy

HIT-6 [points]	Descriptive statistics							
	n	\bar{x}	Me	Min.	Max.	Q1	Q3	SD
HIT-6 before therapy	30	62.67	63.00	50.00	73.00	60.00	65.00	4.65
HIT-6 after therapy	30	48.43	50.00	24.00	68.00	42.00	54.00	9.45
Difference	30	14.23	14.00	0.00	49.00	7.00	18.00	9.78
P	t = 7.97, p < 0.001							

Tab. 3. An assessment of the relationship between the HIT-6 scores and age, body height, body mass and BMI

Variables	Age	Body height	Body mass	BMI
HIT-6 before therapy	R = 0.08 p = 0.666	r = -0.01 p = 0.989	r = 0.06 p = 0.744	R = 0.14 p = 0.475
HIT-6 after therapy	R = -0.03 p = 0.882	r = -0.05 p = 0.778	r = -0.26 p = 0.167	R = -0.31 p = 0.091
Difference	R = 0.17 p = 0.369	R = 0.00 p = 0.992	R = 0.38 p = 0.038	R = 0.37 p = 0.046

r – the value of the Pearson linear correlation; R – the value of Spearman's rank correlation coefficient, p – the level of significance of differences

Tab. 4. An assessment of the relationship between HIT-6 scores and gender

Variables	Women n = 22			Men n = 8			p
	\bar{x}	Me	SD	\bar{x}	Me	SD	
HIT-6 before therapy	63.09	63.50	4.85	61.50	62.00	4.11	t = 0.82 p = 0.416
HIT-6 after therapy	49.68	52.00	9.51	45.00	42.00	8.93	U = 58.5 p = 0.169
Difference	13.41	13.00	10.34	16.50	18.50	8.19	U = 53.5 p = 0.106

which was approximately 62% of the maximum score. The improvement resulting from therapy expressed by decreased intensity of headaches was statistically significant ($p < 0.001$).

The intensity of headaches, both from the time before the therapy and after – has ended, and the effect of therapy was correlated to the patients' morphologic characteristics, i.e. their age, sex, body mass, body height and BMI.

No significant effect of the gender and the age on the intensity of headaches was found. Similarly, these factors did not impact the effects of therapy. However, we found a statistically significant relationship between the body mass of the patients, and between their BMI, and the effect of their craniosacral therapy ($p = 0.038$ and $p = 0.046$, respectively). Both correlations were positive and moderate ($R = 0.38$ and $R = 0.37$, respectively). This means that heavier patients, with higher BMI, had better therapeutic effects than slimmer patients. The height did not play an important role in the therapeutic effects. Also, height, mass, or BMI did not significantly affect the pain intensity the patients reported neither before nor after the therapy.

Białoszewski et al had similar results to our results. Their patients' pain intensity decreased by almost a half. This confirms that craniosacral therapy is effective in reducing pain [10].

In their study, Voigt et al. involved 42 women suffering from migraines. 21 subjects had craniosacral therapy and the remaining 21 subjects, who formed the clinical control group, did not receive any treatment. The authors found that three categories of quality of life improved in the effect of the therapy in the study population. One of these categories was pain intensity. No therapeutic effects were found in the subjects from the clinical control group [11].

The study by Hanten et al. also found a beneficial effect of craniosacral therapy. They studied the effect of craniosacral therapy and of relaxation techniques on tension-type headaches. A group of twenty patients who had craniosacral therapy (one ten-minute long session), and group of twenty patients who had relaxation techniques (the head and the neck resting in most comfortable position for ten minutes) were compared with a group of twenty controls who did not have any treatment. Pain intensity measured with the VAS scale confirmed the efficacy of craniosacral therapy in reducing pain. Patients from the two remaining groups did not report improvement in their pain intensity [12].

It seems that there are still few studies confirming the efficacy of craniosacral therapy in pain reduction. Fernández-de-Las-Peñas et al. searched medical

databases and found only six papers on the efficacy of manual therapies in pain reduction written in English. Only one of these papers studied craniosacral therapy, and its assessment of effectiveness of the therapy was rather ambiguous [13].

A review of studies which compared the efficiency of manual therapy and of pharmacotherapy in pain reduction by Mes-Jimenez et al. comprised five papers. Their results seem to have suggested that manual therapy is slightly more effective. The effects of manual therapy is modest in short-term pain reduction, yet in the long term, they are comparable to pharmacotherapy in reducing the frequency, intensity, and duration of pain [14].

A review of studies on the efficacy of manual therapies in reducing tension-type headaches by Lozano López et al included 14 papers. Of these papers, twelve had adequate scientific quality, according to authors. Studies found that manual therapies reduce pain intensity, reduce frequency of taking analgesics and improve quality of life [15].

In our study, the factors of gender and age did not diversify the analgesic effect of the craniosacral therapy. The BMI had the significant impact on pain reduction. Patients with higher BMI had greater improvement in pain intensity reduction than patients with lower BMI. However, in the available literature we did not find any study results on the relationships of pain intensity reduction after craniosacral therapy and socio-demographic factors.

Our study is one of the few in the available literature that concerns the effect of craniosacral therapy on pain intensity. Our results suggest that the therapy is effective. We also found some relationship between the efficacy of craniosacral therapy and socio-demographic factors.

Our results would be more significant if we had been able to involve a larger group of patients with tension-type headache, or if we had been able to compare the results with clinical controls.

Value of the study. Our study proved that craniosacral therapy conducted in four sessions within a two-week period had positive effect on the wellbeing of patients with tension-type headaches. The programme we suggested, based on the Upledger's 10 step protocol, proved to be efficient and the same procedure may be used by other therapists.

Limitations of the study. Our study did not involve a clinical control group. A clinical control group would enrich the results. A comparison of the method with other therapeutic methods, manual, pharmacological or acupuncture, could widen the scope of the study.

Conclusion

Craniosacral therapy has significant positive effect on pain reduction in patients who received the therapy.

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Conflicts of interest

The authors declare no conflict of interest.

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