Original research

INITIAL EFFICACY EVALUATION OF ACUPUNCTURE THERAPY FOR POST COVID-19 HEADACHE TREATMENT

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ABSTRACT

Background: Among all the neurological disorders that can most frequently be found in the post COVID-19, headache symptomatology is a possible chronic sequela of the infection, making up a rate of 19% after 3 months and 16% after 9 months. This study aims to asses the effectiveness and safety of the acupuncture therapy for post COVID-19 headache treatment.

Methods: A cross - sectional descriptivestudy was carried out on 40 patients with post COVID-19 headache who were receiving acupuncture treatment at Hue Central Hospital. The primary outcomes were pain VAS (Visual Analog Scale) and HIT-6 (Headache Impact Test). The secondary outcome was adverse therapy reactions.

Results: The pain VAS and HIT-6 declined significantly -3.77 ± 1.46 and -15.97 ± 3.25 , respectively. No adverse reactions were found during the study.

Conclusion: Based on the high quality of evidence, we concluded that acupuncture may be an effective and safe therapy for post COVID-19 headache treatment.

Keywords: Post COVID-19 condition, Post COVID-19 headache, Acupuncture.

I. INTRODUCTION

A new type of coronavirus, called SARS-CoV-2, emerged in China in late 2019 and causes COVID-19. COVID-19 is characterized by respiratory symptoms, including respiratory insufficiency requiring invasive ventilatory support. Since the start of the outbreak in early 2020, other symptoms have been described during the acute stage of infection; these include neurological, gastrointestinal, kidney, and hematological manifestations, among others. Among neurological symptoms, headache is a common complaint [1]. Long COVID refers to the symptoms that last for months after leaving the hospital. These symptoms include easy muscle fatigue, mild shortness of breath, persistent headache, the feeling of a foggy head, and the development of psychiatric disorders. Generally, the life quality of at least half of the people who recover from COVID-19, whether mild

or serious, shows a markedly worsening despite having passed a difficult physical and psychological test [2]. According to the World Health Organization (WHO), most people who get COVID-19 recover completely, but there is evidence that around 10-20% of people have different effects that last for a long time after they get better from their initial illness. In October 2022, WHO gave the main official definition of the post COVID-19 syndrome: "Post COVID-19 condition, also known as long COVID, refers to long-term symptoms that some people experience after they have had COVID-19. People who experience post COVID-19 condition sometimes refer to themselves as "long-haulers". These symptoms might persist from their initial illness or develop after their recovery. They can come and go or relapse over time. The most common symptoms of post COVID-19 condition are fatigue, breathlessness and cognitive dysfunction (for

Received: 12/8/2023. Revised: 20/9/2023. Accepted: 21/9/2023. Corresponding author: Tran Le Minh. Email: tranleminh1606@gmail.com. Phone: 0799.322.666

example, confusion, forgetfulness, or a lack of mental focus or clarity) [3]. Persistent headache is one of the most common neurological problems that can last for a long time after COVID-19. Since this kind of headache does not have a name in the International Headache Society classification, we need to pay attention to this long - COVID-19 headache especially because there are plans to do clinical studies to get big data for the International Headache Society Classification Committee [2]. People who have post COVID-19 condition, also called long COVID, may have trouble functioning in daily life. Their condition may make it hard for them to do everyday activities like work or housework. [3]. Garcia-Azorin D (2022) found that 19.0% of 905 patients had long COVID-19 headache after 3 months and 16.0% after 9 months The severity of headache in the acute phase was linked to a longer duration of headache [4]. The mechanisms causing persistent headache after SARS-CoV-2 infection remain unclear. Clinically, headache in the acute stage is usually holocranial [1]. Despite its high prevalence, the management of this feature remains a challenge and little published proof on the pharmacological treatment of COVID-19 headache is available. Non-steroidal anti-inflammatory drugs (NSAID) might be useful in the acute phase, but this is based on anecdotal evidence [5]. Acupuncture, an important method in Traditional Chinese Medicine, is widely used in clinical practice as a treatment for headache. It is reported that acupuncture was one of the most common complementary therapies in worldwide [6]. To initially initially summarize and evaluate the effectiveness of the acupuncture therapy in the treatment of post COVID-19 headache, we conducted this study to assess the effectiveness and safety of acupuncture for post COVID-19 headache.

II. MATERIALS AND METHODS

2.1. Participants and methods

A cross - sectional descriptivestudy was carried out on 40 patients who were examed and treated as outpatients at Hue Central Hospital, with persistent headache symptoms after COVID-19, who volunteered to participate in the study, from January 2022 to July 2022.

2.2. Study tools and data analysis

Diagnosis criteria: Patients were diagnosed post COVID-19 condition based on WHO definition [2] with persistent headache symptoms.

Inclusion criteria: The inclusion criteria for study patients were as follows: (1) people who have a history of probable or confirmed SARS-CoV-2 infection; (2) usually within three months from the onset of COVID-19, with symptoms and effects that last for at least two months (3)The symptoms and effects of post COVID-19 condition cannot be explained by an alternative diagnosis [2].

Exclusion criteria: Persistent headaches that preceded COVID-19. Primary headache (tensive type headache...) and other secondary headaches such as neurological diseases (traumatic brain injury, hypertension syndrome...). The headache that caused by other bacterial and viral infections (meningitis, encephalitis...), headache caused by chemicals, high blood pressure. Exhaustible body. Pregnancy.

Methods of data collection: clinical examination, performing laboratory tests (complete blood count, blood glucose, urea, creatinine, ALT, AST, CRP, electrocardiogram, EEG, straight chest X-ray, cranial MRI). Participants with no physical lesions on brain MRI and/or CT-scanner continued to be followed up.

Intervention: Patients were treated with acupuncture therapy, following the acupuncture process and acupressure protocol according to the procedure number 15 of the document 26/2008/QD-BYT of the Vietnamese Ministry of Health. Participants received acupuncture treatment 1 times a day, daily for 7 days. Acupressure formula included: GV 20, EX-HN5, EX-HN3, LI 11, LI 4, 2 sides.

We evaluated treatment results 2 times: before the study and 7 days after the intervention (D0 and D7).

Outcome indicators: The primary outcomes were pain VAS (Visual Analog Scale) and HIT-6 (Headache Impact Test). The secondary outcome was adverse therapy reactions. Sociodemographic details including age, sex, body mass index (BMI), history of hospital treatment for COVID-19 disease,

To assess the global impact of episodic headaches in patients consulting general practitioners (GPs) using the Headache Impact Test (HIT-6)

questionnaire, and to compare this with measures of headache severity and quality of life. HIT-6 includes 6 categories: pain, social functioning, role function, vitality, cognitive function, and psychological distress. The patient answered 6 questions with a choice of 1 of 5 answers "never", "rarely", "sometimes", "frequently" and "always". Combined with the multiplier formula for each answer item, the total score ranges from 36 - 78 [7].

The Visual Analogue Scale (VAS) measures pain intensity. The VAS consists of a 10 cm line, with two end points representing 0 ('no pain') and 10 ('pain as bad as it could possibly be').

Ask the patient to rate their current level of pain by placing a mark on the line. Use a ruler to measure the distance in centimetres from the 'no pain marker' (or zero) to the current pain mark. This provides a pain intensity score out of 10.

Data were collected by questionnaire, interview, and medical records. Statistical analysis was performed with the use of Microsoft Excel 2016 and Statistical Product and Services Solutions SPSS 20.0.

All information was only used for scientific purposes.

III. RESULTS

3.1. Study characteristics

Table 1 figured the sociodemographic details of the patients who recovered from COVID-19 infection, including age, sex, Body Mass Index (BMI), history of hospital treatment for COVID-19 disease.

Characte	eristics	n	Percentage (%)
Age	$\overline{X} \pm SD$	$41.35 \pm 14,43$	
S	Male	17	42.5
Sex	Female	23	57.5
Body Mass Index	$\overline{X} \pm SD$	22.	71 ± 5.26
History of hospital	Yes	22	55
treatment for COVID-19 disease	No	18	45

Fable 1:	Baseline	characteristics
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The mean of age was 41.35 ± 14.43 . The majority of participants was female (57.5%). The BMI mean

score was 22.71 ± 5.26 . Most of participants had a history of hospital treatment for COVID-19 disease.

Table 2.	Illustrated	the	ratio	of	other	post
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COVID-19 symptoms.		
Symptoms	n	Percentage (%)
Fatigue	34	85
Shortness of breath or difficulty breathing	17	42.5
Memory, concentration problems	8	20
Sleep disorder	13	32.5
Chest pain	11	27.5
Persistent cough	10	25
Muscle aches	5	12.5
Loss of smell or taste	3	7.5

The commonly symptoms of post COVID-19 condition were fatique (85%), shortness of breath or difficulty breathing and headache (42.5%), sleep disorder (32.5%). The other symptoms are memory and concentration problems (20%), persistent cough (25%), muscle aches (12.5%) and loss of smell or taste (7.5%).

3.2. Treatment results

Table 3 illustated the evaluation of the effectiveness of treatment for post COVID-19 headache based on VAS score.

 Table 3: VAS score after treatment

Time	VAS score ($\overline{X} \pm SD$)
D ₀	6.05 ± 1.29
D ₇	2.27 ± 1.3
Reduction	-3.77 ± 1.46
р _(7 - 0)	< 0.01

Before and after treatment, The VAS scores were 6.05 ± 1.29 and 2.27 ± 1.3 (p < 0.01). The VAS reduction was -5.43 ± 3.51.

Time	HIT score ($\overline{X} \pm SD$)
D ₀	61.95 ± 5.95
D ₇	45.75 ± 6.71
Reduction	-15.97 ± 3.25
р _(7 - 0)	< 0.01

 Table 4: Post COVID-19 headache treatment

 according to HIT-6 score

The HIT-6 scores were 61.95 ± 5.95 at D0 and 45.75 ± 6.71 at D7 (< 0,01). The decrease in HIT-6 score was -15.97 ± 3.25 .

No adverse drug reactions were found during the treatment, including diarrhea, dizziness, fatigue, dry mouth, bloating, constipation, tachycardia, blurred vision, tremor and anorexia.

IV. DISCUSSION

The mean age was $41.35 \pm 14,43$. The majority of patients were female (57.5%). The mean score of BMI was 22.71 ± 5.26 . The rate of hospital treatment history for COVID-19 disease accounted for 55%. The most common symptoms of post COVID-19 condition were fatigue (85%), shortness of breath or difficulty breathing and headache (42.5%), sleep disorder (32.5%). This study results were similar to the other survey and reports [8 - 9]. In B. Oronsky's report, the two most common central nervous system symptoms were dizziness (16.8%) and headache (13.1%) [8]. A. Pavli's research illustrated that common symptoms are fatigue (85%), residual dyspnea (10 - 40%), mental problems (26%), chest pain (22%), olfactory and gustatory dysfunction (11%) [9]. After having COVID-19, most people get better, but some people have mid - and long term effects that last for a while. Post COVID-19 condition, or "long COVID," is the term for the group of long - term symptoms that some people have after COVID-19. People who have post COVID-19 condition sometimes call themselves "long - haulers". Some people have mid - and long - term effects like fatigue, breathlessness and cognitive dysfunction (for example, confusion, forgetfulness, or a lack of mental focus and clarity). Some people also suffer psychological effects as part of post COVID-19 condition. These symptoms might carry on from their initial illness or develop after their recovery. They can come and go or relapse

over time. Post COVID-19 condition can make it hard for a person to do everyday things like work or chores. Symptoms are different for different people, and for adults and children. The most common symptoms of post COVID-19 condition include: fatigue, shortness of breath or difficulty breathing, memory, concentration or sleep problems, persistent cough, chest pain, trouble speaking, muscle aches, loss of smell or taste, depression or anxiety and fever [3].

Persistent post - COVID-19 syndrome, also referred to as long COVID-19, is a pathologic entity, which contains persistent physical, medical, and cognitive sequelae following COVID-19, including persistent immunosuppression as well as pulmonary, cardiac, and vascular fibrosis [3].

Pathologic fibrosis of organs and vasculature causes to increased mortality and severely worsened quality of life. Inhibiting transforming growth factor beta (TGF- β), an immuno - and a fibrosis modulator, might help with these post - COVID problems. Current preclinical and clinical efforts are focused on the mechanisms and manifestations of COVID-19 and its presymptomatic and prodromal periods; by comparison, the postdrome, which occurs in the aftermath of COVID-19, which we refer to as persistent post - COVID - syndrome, has received little attention. The long - term effects of post - COVID syndrome will become more important as more treated patients leave the hospital, putting pressure on healthcare systems, patients' families, and society in general to take care of these COVID-19 survivors who have serious medical problems [8].

The reduction of VAS and HIT-6 scores were -5.43 ± 3.51 and -15.97 ± 3.25 , respectively. 40 participants who received acupuncture treatment for 7 days, reported no specific adverse reactions. None of the patients experienced any adverse drug reactions from the treatment, including diarrhea, dizziness, fatigue, dry mouth, bloating, constipation, tachycardia, blurred vision, tremor and anorexia.

Clinical research of A.V.Krymchantowski on 37 patients showed that patients took indomethacin orally at a dose of 50 mg two times a day and pantoprazole 40 mg once a day, for 5 days. On the third and fifth days of the treatment, they used

a headache diary to measure the frequency and intensity of their headache. They classified the pain intensity using a visual analog scale (VAS) as VAS 1 - 4 (mild), VAS 5 - 7 (moderate), VAS 8 - 9 (severe), and VAS 10 (very severe). After treatment with indomethacin, 36 patients reported greater than 50% headache relief from the third day and 5 became asymptomatic on the fifth day. For 5 days, [5]. Treating headache in COVID-19 patients may be difficult. No consensus exists on the medications for this particular type of headache and various drugs have been experimented with anecdotal outcomes. A case report described a chronic migraine patient with COVID-19 comorbidities who was already using fremanezumab and had a resistant headache. She tried many drugs and then received lacosamide IV and other drugs that seemed to improve her condition. Non-steroidal anti-inflammatory drugs were initially contraindicated for COVID-19 patients by the World Health Organization (WHO), but the recommendation was later reversed [5].

Headache occurs as one of the initial symptoms of infection in COVID-19. It can spread over the head, making it feel constricted and heavy. This happens in a large part of people who have the first signs of COVID-19, from 14 to 60%. The so - called long COVID is the group of symptoms that stay with the patient for months after they leave the hospital [8]. These symptoms include muscle fatigue, moderate breathlessness, persistent headache, the feeling of a foggy head, and the development of psychiatric disorders. In general, the quality of life of at least half of the patients who recover from COVID-19, both mild and severe, shows a markedly worsening despite having passed a difficult physical and psychological test. The neurological impairment of post-COVID-19 could have different pathophysiological bases: direct neuro-invasion with a damage on the neuronal pathway, indirect effects mediated by hypoxia, hypertension, coagulopathy and cytokine storm on the central nervous system, up to the worsening of pre - existing brain diseases or new ones (cerebrovascular events, infections, toxic encephalopathy, meningoencephalitis and Guillain Barré syndrome) [8]. Long - term problems come from this complex picture. Among all the neurological disorders that can most frequently be

found in the "long COVID-19," it is not necessary to underestimate the persistent headache for at least 6 months, both as a sign of new onset along with cognitive dullness, like "brain fog," and as worsening/making chronic a migraine that was already there. Even though headache is not a sign of how COVID-19 will progress, it should always be considered as a possible long-lasting effect of the infection. A similar clinical picture of ongoing headache was already seen, as a result of other viral infections, as the New Daily Persistent Headache (NDPH), and was reported by Diaz-Mitoma and Walter Vanast of McGill University in Montreal, as headache caused by Esptein-Barr Virus infection and published in 1987 in Lancet, headache syndrome that lasts > 3 months. However, this putative similarity between NDPH and long -COVID-19 headache needs further discussion and data [8]. The presence of this complex neurological symptomatology, headache and foggy feeling, even after negativization by COVID-19 infection, must be taken seriously in order to prevent a chronicity of the headache and a further decline of the patient's quality of life. Moreover, abnormal innate immune signaling and activation of inflammasomes involved in both COVID-19 headache and migraine, could also have a role in long - COVID headache, as well as sleep problems associated with long - COVID symptoms also be a significant factor causing cognitive problems, poor memory, and chronicity of headaches [8]. According to Traditional Medicine, the headache belongs to the original disease, located in the debilitating mental illness that causes the feeling of foreign evil or dysfunction in the functioning of the government. Healing with acupuncture is a long-standing legacy in oriental medicine. The purpose of acupuncture is to "regulate the qi", to create a stimulus into the acupoint to create a Yin - Yang balance, that is, to restore the physiological state, eliminate the pathological state, and bring the muscles back to work. movement of normal function. Treatments for the post - COVID-19 syndrome, with its longlasting symptoms, are still being researched and debated. The pain VAS is an unidimensional measure of pain intensity, used to record patients' pain progression, or compare pain severity between

Initial efficacy evaluation of acupuncture therapy for post Covid-19...

patients with similar conditions. HIT-6 test includes 6 categories: pain, social functioning, role function, vitality, cognitive function, and psychological distress. Characteristics of changes in pain VAS and HIT-6 scores mean improvement in pain, severity of headache and improvement in patient's quality of life before and after intervention. The therapeutic effect of acupuncture on other symptoms of post - Covid-19 syndrome continues to be researched, such as sleep disorder, chest pain, loss of smell or taste. Acupuncture is an alternative and additional treatment, with few side effects, as one of the treatment options in clinical.

Currently, the evidence and recommendations in the treatment of this syndrome, especially the post-COVID-19 headache, have not yet been reported. Against statistical purposes, evaluate and contribute to research in the treatment of the post - COVID-19 syndrome developed at the unit, together with the employer of the Ministry of Health and the hospital in the treatment of the post - COVID-19 syndrome-19, we have been conducting research and evaluation on this issue since January 2022.

V. CONCLUSION

Based on the high quality of evidence, we concluded that acupuncture may be an effective and safe therapy for post COVID-19 headache treatment.

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