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Research Article

Effectiveness of Cheek Acupuncture in Alleviating Long-term Symptoms of Long COVID: A Prospective Observational Study

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Abstract

This study aimed to evaluate the therapeutic effects of cheek acupuncture on long-term symptoms of long COVID. From January to April 2023, 40 long COVID patients were enrolled. Cheek acupuncture was performed based on pressing pain identified during physical examination, with needles retained for 30 minutes. Follow-ups were conducted on days 3 and 7 after each treatment to assess symptom improvement, which was categorized into five levels. The effective rate was calculated as (highly effective + significantly effective + slightly effective cases) / total number of patients×100%. Results showed significant improvement in symptoms such as fatigue, palpitations, sleep disturbances, pharyngeal discomfort, shortness of breath, and cough, with an effective rate of 100%. Chest pain, headache, and chills also improved. The average number of treatments per patient was 2 (range, 1-4), with no significant adverse reactions observed. The study concluded that cheek acupuncture may be a promising therapy for long COVID, though further large-scale studies are needed to confirm its efficacy and explore its mechanisms of action.

Keywords: Cheek acupuncture; Long COVID; Autonomic nervous system dysfunction

Introduction

Due to the continuing pandemic of COVID-19, many people are experiencing long-term symptoms even after the acute phase of the infection. It was defined as "long COVID" [1-3]. Most common symptoms are post-exertional malaise and fatigue, also brain fog, dizziness, gastrointestinal symptoms, palpitations, change in libido or sexual function, loss of smell or taste, thirst, chronic cough, chest pain, and abnormal movements [4]. Patients suffering from long COVID experience symptoms that influence multiple organs and systems and have strongly negative impacts on their quality of life. The high incidence and long-term symptoms of long COVID present a huge challenge to the public health system. At present, the treatment in long COVID mainly focuses on relieving symptoms, but the results are still far from satisfactory, and its symptoms vary which makes it harder for doctors to treat. Cheek acupuncture is a new micro-needling therapy invented by Dr. Wang Yongzhou. It has been proved reliable in the treatment of pain and many internal medicine diseases, which have similar symptoms [5-12]. To our knowledge, no study has investigated the use of cheek acupuncture in the treatment of long COVID. The aim of this study was to investigate the effectiveness of cheek acupuncture on long COVID.

Methods

From January to April 2023, 40 patients with long COVID who visited the Department of Anesthesiology and Pain Management at Beijing United Family Hospital were enrolled. Demographic and clinical data, such as gender, age, number of days since the initial COVID-19 infection, and the frequency of visits, were recorded for each patient.

Inclusion Criteria:

1. A positive COVID-19 nucleic acid or antigen test prior to the onset of long COVID symptoms.
2. Persistent symptoms for ≥4 weeks after the diagnosis of COVID-19.
3. Consent to participate in this study and signing of the informed consent form.

Exclusion Criteria:

Patients with local cheek skin infections, ulcers, or a history of cheek plastic surgery were excluded from the study.

Acupuncture manipulation

Cheek acupuncture was performed by the same physician throughout the study. Patients were positioned supine. Acupoints were selected based on pressing pain identified during physical examination. After routine skin disinfection, 0.16 mm × 15 mm disposable sterile acupuncture needles (LJ1615, Lejiu Brand, Ma'anshan Bond Medical Instruments Co., Ltd.) were inserted perpendicularly. The depth and direction were adjusted until significant pressing pain relief was achieved. Needles were retained for 30 minutes, and the treatment frequency was adjusted according to symptom progression, with sessions scheduled every 1-2 weeks. Table 1 outlines the acupoints used in this study, their orientations, and their clinical applications [4].

Table 1: Acupoints used in this study, their orientation and clinical applications [4]

Name	Orientation	Applications
Head point	1 inch above the upper edge of the middle point of the zygomatic arch	Headache, dizziness, toothache, insomnia, stress, anxiety, depression, stroke, etc.
Upper energizer point	The cross of the posterior coronoid of the mandible and the lower edge of the zygomatic arch	Headache, cervical pain, chest pain, chest tightness, breast swelling and pain, tachycardia, arrhythmia, asthma, etc.
Middle energizer point	The middle point of the connecting line between the upper and lower energizer acupoints	Stomach cramp, acute/chronic gastritis, heartburn, with acidity
Lower energizer point	Anterior oblique line of the mandible	Abdominal bloating and pain, colitis, dysmenorrhea, pelvic inflammatory disease, menstrual irregularities, leukorrhea, gynecological disease
Cervical point	Top edge of the root of the zygomatic arch	Neck pain, stiff neck after sleeping, cervical spondylosis, sore throat, dizziness, stress, scalene spasm, tinnitus, etc.
Dorsal point	The cross of the lower edge of the zygomatic arch and the inferior capsule of the temporomandibular joint	Back pain, rhomboid muscle strain, chest tightness, shortness of breath, stomachache, heart palpitations, etc.
Lumbar point	The middle of the connecting line between dorsal and sacral points	Lower back pain, lumbar muscle strain, acute lumbar sprains, sciatica pain, herniated disc, etc
Sacral point	0.5 inch to the anterior & superior angle of the mandible	Sacrospinous muscle strain, lower back pain in women, injuries of sacroiliac ligament, bedwetting, prostatitis, etc.
Shoulder point	The middle point of the temporozygomatic sature	Shoulder pain, frozen shoulder, tendonitis of biceps brachii, synovitis of infra-acromion of scapula, tendonitis of supraspinatus muscle, etc.
Hip point	1 inch of anterior & superior of the angle of the mandible on the masseteric tuberosity	Sciatica pain, wound-induced hip osteoarthritis, injury of piriform muscle, groin pain
Knee point	The middle point of the connecting line between the angle of the mandible and the chengjiang point	Knee pain, superficial fibular nerve pain, arthritis of knee joint, hamstring muscle injury, gastrocnemius muscle spasm, etc.

Observation Indicators

Symptomatic improvements were evaluated on the third and seventh days after treatment sessions. Symptom improvement was categorized into five levels: worsening, ineffective (improvement ≤30%), slightly effective (30% < improvement ≤ 70%), significantly effective (70% < improvement ≤ 90%), and highly effective (improvement > 90%). Patients with improvement ≤70% continued to receive cheek acupuncture. The effective rate was calculated using the formula: (highly effective + significantly effective + slightly effective cases) / total number of patients×100%. Numbers of treatments and adverse reactions

experienced during the treatment period, such as nausea or dizziness, were recorded.

Statistical Analysis

All data were analyzed using SPSS 21.0. Quantitative data were presented as mean ± standard deviation (X±SD), and categorical data as frequency (percentage%).

Results

A total of 40 patients (9 males and 31 females, average age 39.0 ± 11.3 years) were involved in this study. The most commonly reported symptoms during their first visit were fatigue (70%), palpitations (37.5%), sleep disturbances (30%), pharyngeal discomfort (30%), shortness of breath (25%), and cough (25%) (detailed in Table 2).

Table 2: Symptoms of the 40 patients at the first visit

Symptom	Number of Patients	Percentage (%)
Fatigue	28	70
Palpitations	15	37.5
Sleep disturbances	12	30
Pharyngeal discomfort	12	30
Shortness of breath	10	25
Cough	10	25
Pain	8	20
Chest tightness	7	17.5
Chest pain	6	15
Abdominal discomfort	4	10
Headache	3	7.5
Chills	3	7.5
Sweating	3	7.5
Ocular discomfort	3	7.5
Brain fog	2	5
Hyperglycemia	1	2.5
Nasal congestion	1	2.5
Rash	1	2.5
Anosmia	1	2.5

Pressing pain was mostly confined to the thoracic and lumbar spine, abdomen, shoulders, anterior neck, and supraclavicular fossa (detailed in Table 3).

Table 3: Pressing pain identified during physical examination in the 40 patient

Pressing pain area	Number of Patients	Percentage (%)
Thoracic spine	34	85
Abdomen	31	77.5
Shoulders	31	77.5
Lumbar spine	31	77.5
Anterior neck	24	60
Neck	16	40
Supraclavicular fossa	12	30
Suboccipital area	11	27.5
Pubic area	7	17.5
Buttocks	5	12.5
Sacral area	2	5

The most commonly used acupoints were the dorsal point (90%), the triple energizer point (85%), and the shoulder point (85%) (detailed in Table 4).

Table 4: Acupoints used in the treatment of the 40 patients

Acupoints	Number of Patients	Percentage (%)
Back point	36	90
Triple energizer point	34	85
Shoulder point	34	85
Cervical point	27	67.5
Head point	8	20
Lumbar point	7	17.5

Hip point	4	10
Sacral point	3	7.5
Knee point	1	2.5

After cheek acupuncture treatment, significant improvements were observed in symptoms such as fatigue, palpitations, sleep disturbances, pharyngeal discomfort, shortness of breath, and cough, with an effective rate of 100%. Other symptoms like chest pain (83% improvement), headache (67% improvement), and chills (67% improvement) also showed notable enhancements (detailed in Table 5). The average number of treatments per patient was 2 (range, 1-4). No significant adverse reactions or complications were reported during the treatment period.

Table 5: Efficacy of cheek acupuncture treatment in the 40 Patients

Symptom	Highly Effective (n)	Significantly Effective (n)	Slightly Effective (n)	Ineffective(n)	Effective Rate (%)
Fatigue	20	8	0	0	100
Palpitations	11	2	2	0	100
Sleep disturbances	7	5	0	0	100
Pharyngeal discomfort	10	1	1	0	100
Shortness of breath	7	3	0	0	100
Cough	6	4	0	0	100
Pain	7	1	0	0	100
Chest tightness	6	1	0	0	100
Chest pain	5	0	0	1	83
Abdominal discomfort	2	2	0	0	100
Headache	2	0	0	1	67
Chills	1	1	0	1	67
Sweating	2	1	0	0	100
Ocular discomfort	0	3	0	0	100

Discussion

Long COVID, a cluster of persistent COVID-19-related problems, known as persistent symptoms after the acute outcome of COVID-19 [1-3]. This study aims to evaluate the therapeutic effects of cheek acupuncture on long COVID symptoms, and its ability to reduce the diverse and severe manifestations of long COVID. Our findings demonstrate that cheek acupuncture could be a promising approach to manage long COVID symptoms, particularly related to fatigue, palpitations, sleep disruption, pharyngeal discomfort, shortness of breath, and cough.

The symptoms associated with long COVID are rather complex as they imply the cooperation of several organs and substantially reduce the quality of life of patients. Office for National Statistics in the United Kingdom reported that about 2.9% of the country's population had suffered from long COVID symptoms for more than 4 weeks [13]. In our study, the most common symptoms admitted by the 40 patients were fatigue (70%), palpitations (37.5%), sleep disturbances (30%), pharyngeal discomfort (30%), shortness of breath (25%) and cough (25%), which correspond to commonly reported symptoms in the literature [4,13]. These symptoms are not only physically detrimental, but they also have a critical psychological impact on people and can lead to a decrease in their work capacity and general well-being.

The long COVID`s pathophysiology is complicated and not thoroughly understood yet. But an increasing body of evidence indicated autonomic nervous system dysfunction as a pivotal factor in long COVID persistence. Studies have indicates that there is a significantly higher probability of autonomic dysfunction in those with persisting symptoms from long COVID, ranging from 37.5% to 67% [14-16]. Autonomic dysfunction and long COVID share many symptoms. Dizziness, tachycardia, sweating, headache, and “brain fog” are some of the symptoms [17]. It may be caused by the invasion of viruses to autonomic centers, autoimmunity, persistent inflammation, hypoxia, overactive sympathetic system, and renin-angiotensin system imbalances [18]. The similarities provide a theoretical foundation for a treatment approach towards autonomic regulation.

Cheek acupuncture is a new treatment for long COVID symptoms. It is developed by Dr. Yongzhou Wang. It represents a unique treatment strategy based on the physical-mental theory of Western medicine, the biological holographic theory, the anatomical structure of the human body, and the Qi pathway of traditional Chinese medicine. The practice assumes that certain points located at the cheek correspond to a set of various functions in people and are therefore capable of achieving therapeutic effects [5]. Previous studies have demonstrated the efficacy of cheek acupuncture for control of pain [6,7], treatment of conditions such as cardiac syndrome X [8], cervical insomnia [9], migraine [10], allergic rhinitis [11], and functional dyspepsia [12]. The similarities between these conditions and long COVID indicate that cheek acupuncture may have a broad therapeutic application for long COVID.

In our study, the pressing pain noted on physical examination was mostly located in the neck, supraclavicular fossa, thoracic and lumbar spine, and abdomen. These regions include important

anatomical characteristics of the autonomic nervous system, specifically the cervical sympathetic chain, thoracic sympathetic fibers, and celiac ganglion. The easing of symptoms such as fatigue, palpitations, sleep disturbances, pharyngeal discomfort, shortness of breath, and cough, with an effective rate of 100%, indicates that cheek acupuncture may be able to regulate autonomic function by normalizing symptoms at anatomical sites. The fact that there were no major side effects or complications during the entire treatment period further confirms the remarkable safety and tolerability of this therapy.

The biological holographic model may explain the underlying mechanism that applies to long COVID. Wang et al. [6] proposed the theory of biologic holographic model. The signals of local injuries can be sensed and analyzed by homunculi at local cheek, spinal cord, and cerebral cortex levels. Acupuncture on the cheek activates these homunculi. Thus, the autonomic nervous system is regulated, and symptoms are finally relieved. A systemic regulatory function of cheek acupuncture establishes a broad therapeutic effect on different symptoms of long COVID.

Although our study achieved good results, there were some limitations. It was concerned the small sample size and the non-double-blind design might affect the generalizability of the study results. It's also known that the follow-up after infection with COVID-19 occurs in a relatively short period, thus, it could be spontaneous recovery. Ideas for future research should involve expanding the sample size, a randomized double-blind controlled design, and extending the duration of the study to evaluate the efficacy and the mechanisms of cheek acupuncture in treating long COVID.

Conclusion

Cheek acupuncture appears to be safe and effective for alleviating the symptoms of long COVID, including fatigue, palpitations, sleep disturbances, pharyngeal discomfort, shortness of breath, and cough. More research is required to investigate the mechanism in detail and to verify our findings in larger, rigorous clinical trials.

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