

# Fu's Subcutaneous Needling Immediately Improved Covid-19-Associated Cough: A Case Report

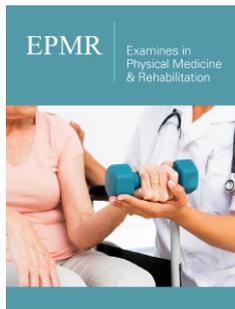
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## Abstract

**Rationale:** COVID-19-associated cough refers to cough that persists after SARS-CoV-2 infection and cannot be explained by other causes and diagnoses. FSN had been effective for chronic cough based on previous study. Therefore, we reported a case of COVID-19-associated cough effectively treated by Fu's Subcutaneous Needling (FSN).

**Patient concerns:** A 23-year-old male patient developed fever and cough after infection of SARS-CoV-2. Although Nonsteroidal Anti-Inflammatory Drugs (NSAIDs) brought down the fever, cough still continued.

**Treatments and outcome:** The patient was treated with FSN for three times continuously, and the patient's cough and pharyngeal itch were significantly improved. Cough Evaluation Test (CET) score was decreased from 16 point to 6 point and cough Visual Analog Scale (VAS) score was decreased from 70mm to 5mm. And the patient had no obvious cough or pharyngeal itch during follow-up 3 days later.

**Keywords:** Fu's subcutaneous needling; COVID-19-associated cough; Swaying movement; Reperfusion approach; Tightened muscle

## Introduction

COVID-19 (Corona Virus Disease of 2019), is caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). During the post-infective phase, an array of fluctuating and persistent symptoms are described, including cough, fatigue, dyspnoea, pain, and cognitive impairment [1]. Among above Covid-19-associated symptoms, roughly half of COVID-19-infected patients experience cough, and nearly a fifth have long-lasting coughs according to a follow-up study [1]. Although Nonsteroidal Anti-Inflammatory Drugs (NSAIDs) and specific treatment are received in the early stage, the symptom of cough can't be effectively alleviated. We treated dozens of cases of Covid-19-associated cough successfully, here we reported a case with comprehensive and detailed information.

## Case Report

A 23-year-old male patient complained of severe cough for 10 days on January 8, 2023. 10 days ago, the patient got high fever with 38.5 °C and began to cough with a small amount of yellow viscous sputum and pharyngeal itching after SARS-CoV-2 infection (tested positive for Covid-19 on December 25, 2022). The patient denied any history of hypertension, diabetes, heart disease and no history of smoking. Although Nonsteroidal Anti-Inflammatory Drugs (NSAIDs) brought down the fever, but his cough remained the same. Cough Evaluation Test (CET) and cough Visual Analog Scale (VAS) score were to evaluate cough severity and its impact on health. CET score was 16 and cough VAS score was 70mm before treatment. Thus, the patient came to acupuncture clinic of Bao'an Hospital of Traditional Chinese Medicine to seek for help.

## FSN therapy

The practitioner considered that the cough symptoms were associated with tightened muscles, which contain at least one Myofascial Trigger Point (MTrP). After palpation by practitioner, sternocleidomastoid, scalene, pectoralis major and erector spinae muscles were recognised as tightened muscles. Then FSN treatment was performed as follows [2]:

**Swaying movement:** The patient was in supine position. After routinely disinfected the needle insertion site, a disposable FSN produced by Nanjing FSN Medical Co., Ltd. was inserted into the subcutaneous layer around the tightened muscles detected above (Figure 1). Swaying movement was performed for 100 times a minute which the needle was swayed horizontally from side to side at the angle of about 30°. During the movement, it's important to avoid patient sensation of soreness, distension, numbness and pain.



**Figure 1:** The needling area of Fu's subcutaneous needling. (A) sternocleidomastoid muscle, (B) scalene muscle, (C) pectoralis major muscle and (D) erector spinae.

**Reperfusion approach:** Reperfusion approach is also an important partner of FSN to obtain the curative effect. During the swaying movement, reperfusion approach is performed simultaneously according to active or passive movement of the related muscles, and the practitioner exerted equal force against the patient's active contraction of the tightened muscles. Each

reperfusion approach lasted for 8 seconds, and then the patient relaxed at least for one minute before next reperfusion approach. The reperfusion approach for one tightened muscle was repeated for 2-3 times. Reperfusion approach for the tightened muscles was described above include the following (Figure 2):



**Figure 2:** Reperfusion approach (A) sternocleidomastoid muscle, (B) scalene muscle, (C) pectoralis major muscle and (D) erector spinae.

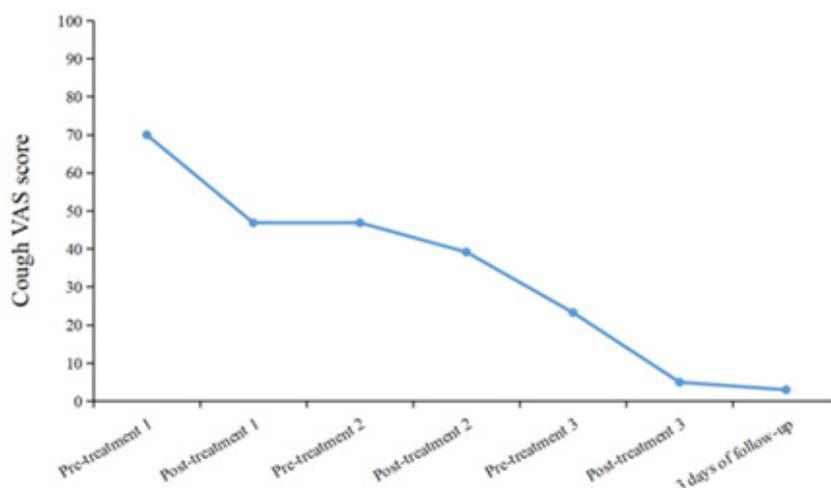
- Sternocleidomastoid muscle:** The patient was in supine position and flexed his neck with resistance by the practitioner's push.
- Scalene muscle:** The patient was in lateral decubitus position and raised his head with resistance by the practitioner's push.
- Pectoralis major muscle:** The patient was in supine position and adducted shoulder joint with resistance by the practitioner's pull.
- Erector spinae:** The patient was in prone position and raised up his arms and legs.

After the completion of the treatment procedure, the cannula,

one part of FSN needle, was left to the skin and retained for 4-6 hours with a disposable sterile dressing [3].

## Outcome

Immediately after the first treatment, the patient's cough VAS score decreased from 70mm to 46.9mm. Cough frequency had been decreased, and yellow phlegm could be easily to expectorate. The cough VAS score decreased from 46.9mm to 39.2mm after the second treatment. There were only occasional coughing episodes during the day time, and no coughing occurred during the night time. After 3 times of treatment, cough VAS score decreased to 5 mm and CET score decreased to 6 point. Upon follow-up 3 days later, the patient achieved nearly complete remission of cough, sputum, and itchy throat, cough VAS score of which was 3mm (Figure 3).



**Figure 3:** Cough visual analog scale score before and after treatment. VAS, visual analog scale.

## Discussion

Most people experience persistent cough after SARS-CoV-2 infection. However, little is known about the mechanism of COVID-19-associated cough. From the effective outcome with FSN treatment in this case, we postulate the mechanism of FSN treatment for COVID-19-associated cough. Previous study had shown that FSN was effective for chronic cough due to MTrPs [4]. Thus, we deduce that persistent cough may be mainly due to continuous stimulation to the bronchial smooth muscle by virus, leading to muscle spasm and further result in respiratory system damage, which can present with severe symptoms of chest pain, dyspnea and so on. We consider that persistent cough may cause tightened muscles around the thorax or trachea, such as sternocleidomastoid muscle, scalene muscle, pectoralis major muscle and erector spinae. Cough reflex sensitivity may increase when muscles are tightened for the tightened muscle affects local blood circulation. Moreover, respiratory secretions by coughing presents in the form of discharge, but tightened muscles are not benefit for sputum discharge, which would aggravate the bronchial smooth muscle spasm and slow down the healing time.

FSN treatment mainly acts on the subcutaneous loose connective tissue, and quickly improves the local ischemia and restores the

blood supply of the muscle by swaying movement. Combined with reperfusion approach, the tightened muscles around the thorax or trachea quickly relieve and the smooth muscle of bronchus relax, enhancing the strength of sputum excretion and relieving the cough. COVID-19-associated cough is a self-limited disease which can often be cured with three times of FSN treatment. If patients still got cough after treatment, whether there is concomitant bacterial infection or underlying diseases should be noticed. This is a case report of FSN therapy for COVID-19-associated cough. However, its effectiveness and mechanism need to be proved by further systematic studies.

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