

## Letter to the Editors

# Application value of ultrashort waves for COVID-19: Viewpoints from Chinese experts

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A novel coronavirus disease (COVID-19) hit the central Chinese city of Wuhan in late December 2019, and subsequently spread rapidly to all provinces of China as well as multiple countries. As of 13 October 2021, a total of 6,495,672,032 vaccine doses have been administered. Ultrashort waves as a common physical therapy has an anti-inflammatory effect and alleviates pulmonary fibrosis. Its clinical effect has been confirmed in the treatment of severe acute respiratory syndrome (SARS) in China [1]. Based on many years of clinical experience and the advice from the front doctors, we think that ultrashort waves may be a good treatment and rehabilitation method for COVID-19.

Ultrashort waves refer to electromagnetic waves with a frequency of 30–300 MHz and a wavelength of 1–10 m. Compared with short waves and microwaves, ultrashort waves more easily reach into the human tissues Chinese scholars have also studied the mechanism of ultrashort waves for killing bacteria and antivirals The study by Chen et al. [2] points out that the titer of interferon increased 5 times after 4 times of ultrashort wave treatment, which was close to the level of human leukocyte interferon. It is suggested that one of the effective mechanisms of ultrashort wave therapy may be related to the improvement of interferon synthesis. Xu et al. [3] believed that the medium and small doses of ultrashort waves could enhance the phagocytic function of the reticuloendothelial system, increase the number of phagocytes phagocytic capacity, antibody, complement and agglutinin. The activity of alkaline phosphatase in leukocyte and the titer of interferon also increased. Meanwhile, the oscillation and endothermic effect of ultrashort wave electric field can also cause the bad living environment for pathogenic microorganism which can affect the replication of the virus Therefore, ultrashort waves play an active role in anti-inflammatories and antivirals.

In China, ultrashort waves are widely used in the treatment of pneumonia and proved to be effective. Chi et al. [4] studied elders with pneumonia and the results showed that the symptoms of the patients were alleviated or relieved after treatment, and the cure or effective rate were significantly higher than

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31 that of the control group, while the proportion of CD4+, CD8+ and the ratio of CD4+/CD8+ also tended  
32 to balance. The results suggest that ultrashort waves can improve the immune activity of  $T_h$  cells and  
33 prove that ultrashort waves can play a positive role in regulating the immune function Zhang's [1] study  
34 found that on the basis of conventional treatment combined with ultrashort wave treatment of SARS  
35 patients, the speed of hormone withdrawal was significantly faster than that of patients only treated with  
36 drugs alone. The absorption of pulmonary inflammatory lesions was accelerated, the average course  
37 of disease could be shortened by 5 days, and the pulmonary fibrosis was not aggravated. The clinical  
38 effect of comprehensive ultrashort wave treatment of SARS was therefore very obvious. The study by  
39 Wang et al. [5] also confirmed that physical factor therapy can promote the absorption of pulmonary  
40 interstitial lesions and accelerate the recovery of SARS patients. The famous Chinese rehabilitation expert  
41 Dengkun Nan [6] also pointed out in 2003 that the rehabilitation of SARS patients' lung function remains  
42 to be solved after their clinical treatment. In the whole rehabilitation process of SARS patients, physical  
43 factors can be used to change their pathological changes and promote the recovery of lung function to the  
44 greatest extent, which is necessary for the patients to return to society, work and quality of life stages and  
45 measures.

46 Above all, the effect of ultrashort waves in the treatment and rehabilitation of pneumonia patients has  
47 been confirmed, especially in the treatment and rehabilitation of SARS patients. Therefore, we believe  
48 that in the treatment of COVID-19, ultrashort waves can be used as an effective supplementary treatment  
49 to improve the treatment effect and later rehabilitation effect. However, there is no more advanced data to  
50 prove the effectiveness of ultrashort waves in the treatment and rehabilitation of COVID-19, so further  
51 clinical research is necessary to confirm this claim.

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