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## Editorial

## Traditional Chinese medicine contributes to the treatment of COVID-19 patients

Since December 2019, the SARS-CoV-2 infection has worldwide affected thousands of people and is life-threatening to patients who progress to the severe/critical condition, especially in the elderly. Governments and scientists all over the world are urging for new treatment measures to combat this world epidemic. Ever since the start, most agreements on the measures against COVID-19 rely on early RT-PCR diagnosis, proper quarantine, and vaccination; while treatment strategies rely on the use of multiple antiviral drugs and cytokine inhibitors. However, when facing of this pandemic, it takes time to develop specific drugs and vaccines. To save life, it is indeed necessary to use the existing experience and knowledge of traditional Chinese medicine (TCM).

Historically, there have been not less documents recorded in the classical TCM literatures about the use of TCM to treat epidemics. In ancient times, there was no Western medicine, while TCM was used on the main historical infectious disease battlefields. Many TCM formulas and products have been widely application in treating infectious and non-infectious diseases. The accumulated clinical experiences and effective prescriptions are believed to be used effectively today. In this urgent period, TCM should be taken into reference as a treatment option because most patients are still suffering. Importantly, there are also academically skilled TCM experts in China who have rich clinical experiences and can properly treat the novel coronavirus pneumonia to achieve curative outcomes.

In this issue of *Chinese Herbal Medicines*, Professor Chang-xiao Liu, the academican of Chinese Academy of Engineering and Editor-in-Chief of this journal, provides his wonderful insights on the outbreak and characteristics of COVID-19 to us, as well as particularly highlights all advantages of the therapeutic TCM principles and formulas for treating this new coronavirus epidemic. His insightful views are able to guide us to use TCM properly to fight this century virus.

Since the outbreak of SARS-CoV-2 infection, Chinese Government initiated a policy that the COVID-19 patients should be treated with integrated Chinese and Western medicine because it is believed that such integrative approach would achieve better objective curative effects than that of using any one mono medicine alone. According to the news reports in China, TCM treatment has been applied in over 90% of COVID-19 patients, and some Chinese herbal formulas showed significant potencies of relieving patients' symptoms, shorting the time of fever and reducing the cases being converted from the mild cases into the severe and even the critical ill.

The drug action mechanisms of TCM are basically both similar and different from the conventional medicine. For the similarity, although COVID-19 is a new infectious disease, there have been reports to show that certain chemical components contained in a Chinese herbal formula are actually targeting on the pathological and molecular targets of COVID-19 to produce therapeutic effects, such as 3CL Pro, ACE2 and IL6 etc. On the contrary, the curative effects of Chinese herbal formula sometimes are not necessarily by directly inhibiting or killing the virus, but through the integration of various aspects such as relieving cytokines storm syndrome, protecting human tissues and organs, relieving immunological injury and enhancing the body's ability. With quick development of research programs on this new infection, we believe that solid scientific data would be provided to support widely application of TCM against this epidemic.

For further implantation of TCM treatment on the novel coronavirus pneumonia worldwide, we would suggest that "full coverage" and "full process" should be ensured in treating COVID-19 patients, together with highly quality assurance of TCM intervention throughout the process. Especially, TCM must be prescribed early, and the sooner the better, so as to prevent the disease from progressing to a serious condition. However, for the severe and critical cases, incorporating TCM into conventional treatment methods are also recommended so as to generate synergistic effect by the combination therapy of Chinese and Western medicine.

Moreover, TCM is able to play very important roles in rehabilitation of COVID-19 patients. Although some patients have reached discharge standard such as negative viral load and relief of observable syndromes, the patients are usually still suffered from the syndrome of *qi* and *yin* deficiency or other clinical symptoms and pathological alterations like pulmonary fibrosis and multiple organ functional destruction after immunological injury, which may not be completely resolved during their hospitalization. All these above manifestations, we may call them as a "Post-COVID-19 Syndrome" which is indeed needed for further treatment after discharge; while TCM is an indispensable method that should be promoted to use in such a stage of COVID-19 patients.

In the near future, we should further perform comprehensive drug screening based on the reported anti-viral molecular targets with our existing TCM chemical database, as well as the existing marketed drugs. Because scientific data of TCM treatment have not yet been solicited enough, more efforts should be made to expand

deeply research on TCM for treating COVID-19 patients. And, we hope that we can enforce the contribution of the TCM treasure box together with modern technological investigation to combat the SARS-CoV-2 infection powerfully, together with internationals.

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