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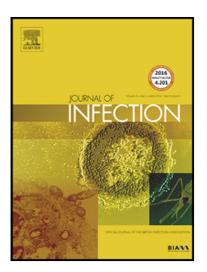
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Letter to the Editor

Comprehensive analysis for diagnosis of novel coronavirus disease (COVID-19) infection

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Dear Editor:

We read with interest the recent papers in this Journal by Hao who described clinical features of atypical 2019 novel coronavirus pneumonia with an initially negative RT-PCR assay.[1] We would like to share our opinions for diagnostic approach of COVID-19 infection, the diagnostic approach for COVID-19 infection should be made comprehensive analysis.

Since December 2019, a series of patients with unknown cause pneumonia had been reported in Wuhan of China. Recently, study on the early transmission dynamics had been reported that human-to-human was the epidemiologic characteristics for COVID-19 infection.[2] Therefore, it is very essential to diagnose precisely the patients suspected with COVID-19 infection for opportune isolation or treatment.

Chest CT and RT-PCR for detection of COVID-19 infection. Currently, the real-time reverse transcriptase polymerase chain reaction (RT-PCR) amplification of the viral DNA is considered as the "gold standard". However, initial RT-PCR is not always positive in the patients with COVID-19 infection.[3, 4] In that situation, chest computed tomographic (CT) images could be played an important role to detect the lesions in the pulmonary parenchyma in the patients suspected with COVID-19 infection. But it doesn't mean that the abnormalities of CT images could be observed in the COVID-19 infection while the initial RT-PCR is positive or negative.[3-6] Therefore, even though chest CT plays a key role in detection or diagnosis of COVID-19 infection, however, chest CT examination and RT-PCR results should be mutual verification for precise diagnosis in the patient suspected COVID-19 infection.

Clinical characteristics. Beside CT examination results, initial symptoms were helpful in screening. For clinical manifestation, fever, dyspnea, chest tightness, cough, sputum, weakness, vomiting, diarrhea, etc. were observed in the patients with COVID-19 infection.[5, 7] Of these clinical characteristics, fever and cough were the most frequency percentage of initial symptoms, and the other manifestations should be taken consideration.

Laboratory results. Laboratory results were considered as auxiliary information to diagnose COVID-19 infection.[5, 7] In our hospital, there were 14 cases confirmed COVID-19 infection. Of 14 patients, white-cell count was tended to be normal in 12 patients (85.71%), lymphocyte (8/14, 57.14%) and monocyte (9/14, 64.29%) percentage had a tendency to decrease. Significant statistical differences were observed in lymphocyte percentage decreased and C-reactive protein elevated (all $P = 0.015$) in the patients with COVID-19 infection between initial positive chest CT results (10/14) and negative chest CT results (4/14). Thus, knowing these clinical laboratory results was helpful for the doctor to diagnose

the current novel coronavirus infection.

Exposure history. Recent studies reported that most of the patients with COVID-19 infection had the exposure history to the source of transmission within past 14 days. Approximately 13 patients (2%) had the history of direct contact with wildlife, 75% cases in the epidemic area or contact with resident of epidemic area.[5, 7] However, 28 cases (35%) with COVID-19 infections were no obvious history of exposure,[5] which needs to pay more attention in this situation.

In conclusion, even though chest CT has played a key role in detection or diagnosis of COVID-19 infection with some typical CT features while the initial RT-PCR result is negative. However, not all the cases had the initial abnormality chest CT results or positive RT-PCR in the patients with COVID-19 infection. Consequently, RT-PCR results, chest CT features, clinical manifestation, laboratory results, and exposure history should be made a comprehensive analysis to diagnose COVID-19 infection for the clinical decisions beyond clinical and radiological features.

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