Molecular Diagnosis Challenge in COVID-19 Pneumonia Phase

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COVID-19 is a viral disease with an incubation period of 0-4 days, which has two clinical phases: viral and pneumonia respectively. In the first phase, Real-time PCR technique is usually used to detect nucleic acid positive SARS-CoV-2. The definitive positive result is confirmed by this diagnostic technique; however, there is possibility of error in any case (1). In some patients, Real-time PCR test is negative on nasopharyngeal and oral swabs despite the positive CT scan result (2); in these patients, an invasive method such as Broncho alveolar lavage (BAL) that is commonly used to help diagnose and characterize pneumonia in these patients but BAL has not been proposed in WHO COVID-19 sampling protocol. At this time the important question is; how COVID-19 negative Real-time PCR results could be explain?

To provide the answer to this question, it should be said that 7-10 days after the disease, the patients enter the second phase (pneumonia) after viral phase. In this phase, the virus is less likely to be present in mucous membranes, especially nasal and laryngeal mucosa. Then the virus invades target organs such as lungs, heart, renal system, and gastrointestinal tract, which are responsible for delivering angiotensin-converting enzymes (ACE-2) (3-5). The virus starts a secondary attack and causes the patient's condition to worsen 7-14 days after the initial intrusion due to cytokine storm (6); therefore, in this phase, considering the migration of virus from nasopharynx and oropharynx to other organs like lungs, Real-time PCR test result may be negative, and it is best to focus on interpreting the CT scan and observing ground glass lungs or pulmonary infiltration of target cells.

In patients with COVID-19, chest usually shows the appearance of ground glass with or without consolidation disorders, which is consistent with viral pneumonia (1). Chest CT abnormalities are more likely to be bilateral, have a peripheral distribution, and involve the lower lobes. Other less common symptoms include pulmonary thickening, abnormal accumulation of water in lungs, and lymphadenopathy (7). Although a chest CT scan is helpful in diagnosis of COVID-19, no findings can completely rule out or confirm the possibility of COVID-19.

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