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Editorial

Reality of COVID-19 Reinfection

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Generally, the immunity development that responds to a pathogenic microorganism occurs around 1 - 2 weeks with a non-specific innate response followed by body producing antibodies (humoral responses), immunoglobulins in combination with production of T-cells or cellular immunity. The virus in the body will be eliminated by this combined adaptive response. The definitive viral elimination by their protective role from viral reinfection is yet unidentified. Around eighty known distinct genotypical variants of SARS-CoV-2 (COVID-19) have been identified. Several previous studies demonstrated that SARs-CoV-2 (COVID-19) can persistently present in the feces of the patients, whereas no oral-fecal transmission markers were identified. A previous study in Beijing, China revealed that the virus can persist in the sputum for 39 days after becoming pharyngeal-swab negative. IgM-negative, IgG-positive antibody response and non-detectable viral ribonucleic acid (RNA) after discharging and consequent positive-SARS-CoV-2 (COVID-19)-RNA test, remained negative IgM, and positive IgG antibody tests was demonstrated in three readmitted asymptomatic-COVID-19 patients in Tongji Hospital, China. Due to the highest titers of SARS-CoV-2 RNA reaching within 7 - 10 days of clinical symptom onset and declining thereafter, the upper respiratory tract (posterior nasopharyngeal tonsil region) swabs should be performed.

The highest positive rate of COVID-19 ranked from bronchoalveolar lavage fluid (BALF) (93%), sputum (72%), nasal swab (63%), fibrobronchoscopic brush biopsy (46%), pharyngeal swab (32%), feces (29%), and blood (1%) was demonstrated in a previous study conducted on 205 patients with 1,070 samples. Another previous study revealed that the highest levels detected SARS_CoV-2 (COVID-19) RNA by the reverse transcriptase-polymerase chain reaction (RT-PCR) reveals as the following: 1) Nasal swab (Mid-turbinate swab, anterior nares swab) and oropharyngeal swab, and 2) Rectal swab in first and second week of the clinical symptom onset, respectively. In comparison of the accuracies of the RT-PCR and computed tomography (CT) of the chest in COVID-19 patients by several previous studies demonstrated 59% versus 88%, 71% versus 98%, 92% versus 44% and 10% versus 96.1%, respectively. Clinicians should differentiate the COVID-19 recurrences from several secondary complications, such as persistence of traces of viral RNA (detectable in respiratory specimens up to 6 weeks after onset of clinically-cured patients' symptoms), super-infection, or pulmonary embolism. Nevertheless, some patients did not develop SARS-CoV-2 (COVID-19) antibodies more than 21 days after presenting severe symptoms, reported by a previous study. An inappropriate immune response can facilitate an inflammatory rebound and could establish an explanation to the clinical symptom recurrence. Currently, there is no large-scale study conducted on the effectiveness of the antibodies protected against the subsequent human COVID-19 infection that will be critically supported by the World Health Organization (WHO).

In conclusion, the effective antibody-mediated immunity is not enough evidence to guarantee the protective mechanism against re-infected-COVID-19. The type of specimen collection and technical errors, the methods used before patient discharging, and the presence of fecal viral RNA without evidence of viral replication in fecal swab should be considered. Viral culture, inflammatory tar-

get monitoring, genomic comparison of SARS-CoV-2 (COVID-19) strains involving both episodes of infection, and evaluation of innate and adaptive immunity are recommended for understanding of the recurrences of COVID-19.