ACTA BIOCHIMICA INDONESIANA

EDITORIAL NOTES

THE PERSISTENCE OF COVID-19 INFECTION, A GOLDEN OPPORTUNITY TO BE OBSERVED

FM Siregar[1*], Sarmoko[2]

[1]*Department of Biochemistry, Faculty of Medicine, Universitas Riau, Pekanbaru, Indonesia*

[2]*Faculty of Pharmacy, Universitas Jenderal Soedirman, Purwokerto, Indonesia*

***Corresponding author : fajrifkunri@gmail.com**

The Coronavirus disease 2019 (COVID-19) pandemic has attacked for about a year. As the end of 2020, it was found that 83,195,903 confirmed cases, with a death total of 1,813,142 (2.18%) worldwide. This number will continue to increase along with the end of the pandemic. The efforts to address this issue such as implementating of health protocols and accelerating herd immunity did not produce optimal result so far.

Many publications have been reported related to COVID-19 cases, dealing with the NCBI database (almost 100,000 publications). One of the interesting findings is the report indicates that SARS-Cov-2 RNA can be found for a long time (persistent), even though the patient has no clinical symptoms.

Cento *et al.* reported 37 patients who have recovered clinically still show positive RT-PCR results after more than 51 days since the patient has been discharged from the hospital.[1] Wang *et al.* also report similar results, in which SARS-Cov-2 RNA can be found in patients till 92 days after symptom onset.[2] Ling *et al.* also found the indication of the persistence of SARS-Cov-2 infection. Based on their study, viral RNA was detectable in 81.8% of stool samples (54 from 66 people) although nasopharyngeal swab results were negative.[3] Beltempo *et al.* also found that SARS-Cov-2 RNA can still be detected in post-mortem swab 35 days after death.[4] The persistence finding of positive RT-PCR results, although it does not necessarily indicate the presence of the SARS-Cov-2 virus and it is still viable or transmissible. Thus, it should attract attention since RNA is an easily degraded material.

On the other hand, these findings also indicate that COVID-19 infection can be persistent and may develop into a chronic infection. One explanation that supports this hypothesis is the ability of SARS-Cov-2 to alter its pathogenicity. Based on the ultra-deep sequencing study, 11 patients, 33 mutations are obtained for SARS-CoV-2, 19 are categorized into new mutations. From these 11 patients, the patient of number 11 shows persistent positivity for 45 days and it is also found three-nucleotide mutations in the patient's viral isolate.[5] Besides, lymphocytopenia is often found in the COVID-19 patient. In addition, the autopsy result found the lymph nodal and spleen damage, which

indicate a damaged immune system in cases of persistent infection.[2] Recent findings report that the SARS-Cov-2 can infect the central nervous system and may lead to serious medical conditions for Covid-19 survivors in the future.[6]

Based on these findings, many things still have not been revealed, and the pathogenesis of Covid-19 has not been answered. Why can RNA be detected even though the patient has no symptoms? How can the virus survive for long in the body of host? How is the mobility of the virus in the human body? What are the long-term effects on patients who have been declared cured? These questions provide a golden opportunity for researchers to investigate and explore further, particularly regarding the persistence mechanism of Covid-19 infection.

REFERENCES

1. Cento V, Colagrossi L, Nava A, Lamberti A, Senatore S, Travi G, et al. Persistent positivity and fluctuations of SARS-CoV-2 RNA in clinically-recovered COVID-19 patients. J Infect. 2020 Sep 1;81(3):e90–2.
2. Wang J, Hang X, Wei B, Li D, Chen F, Liu W, et al. Persistent SARS-COV-2 RNA positivity in a patient for 92 days after disease onset: A case report. Medicine (Baltimore). 2020 Aug 21;99(34):e21865.
3. Ling Y, Xu S-B, Lin Y-X, Tian D, Zhu Z-Q, Dai F-H, et al. Persistence and clearance of viral RNA in 2019 novel coronavirus disease rehabilitation patients. Chin Med J (Engl) [Internet]. 2020 Feb 28 [cited 2021 Jan 31]; Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7147278/
4. Beltempo P, Curti SM, Maserati R, Gherardi M, Castelli M. Persistence of SARS-CoV-2 RNA in post-mortem swab 35 days after death: A case report. Forensic Sci Int. 2021 Feb 1;319:110653.
5. Yao H, Lu X, Chen Q, Xu K, Chen Y, Cheng L, et al. Patient-derived mutations impact pathogenicity of SARS-CoV-2. medRxiv. 2020 Apr 23;2020.04.14.20060160.
6. Kumari P, Rothan HA, Natekar JP, Stone S, Pathak H, Strate PG, et al. Neuroinvasion and Encephalitis Following Intranasal Inoculation of SARS-CoV-2 in K18-hACE2 Mice. Viruses. 2021 Jan;13(1):132.