Case Report : Low Level ImmunoglobulinG (IgG) in reinfection COVID-19 case

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Abstract

Million people have infected the SARS-CoV-2 epidemic, which is currently spreading. We describe a confirmed COVID-19 patient whose oropharyngeal swab test for SARS-CoV-2 RNA and have positive PCR test results after 8 weeks proclaim negative result of PCR test for SARS-COV-2. ImmunoglobulinG was not detected during the initial illness. In this study, we discuss the potential role of low IgG in cases of reinfection.
Keywords: reinfection, covid-19, antibody

Abstrak

Ribuan penduduk telah terinfeksi SARS-CoV-2 selama pandemic dan hingga saat ini masih terus menyebar. Penelitian menggambarkan kasus terinfeksi COVID-19 yang positif dengan pemeriksaan RT-PCR. Pemeriksaan telah negative dan kembali positif setelah 8 minggu dinyatakan negative. Padas sat tersebut pasien tidak terdeteksi antibody IgG selama fase awal infeksi. Pada kasus ini mendiskusikan adanya peluang kadar IgG yang sangat rendah pada kasus reinfeksi.
Kata kunci : reinfection, covid-19, antibody

1. Introduction

Reinfection case with COVID-19 is rare, with only a handful cases reported among 42 million cases in the world. Reports reinfection case COVID-19 have been reported in Hongkong, Netherlands, Belgium, Ecuador, Israel, China, Pakistan, Israel and Australia[1]. Recent reports of patients testing positive again even after their symptoms had subsided and tests had come back negative raise concerns about the likelihood of reinfection[2].

We want to discuss about the findings antibody persistent of reinfection in aspect of immunology. Knowing about reinfection would assist the populace continue control measures, reducing the percentage of the people that would become infected again and the likelihood that the disease would exhibit difficulties in its second occurred. This was first case reinfection COVID-19 reported in Bengkulu with no antibody at first infection.

2. Case Presentation

An 27-year-old female with a history positive COVID-19 in September 2020. Patient is medical health worker. In November 2020 the patient was admitted to the hospital with a febris, anosmia, ageusia dan productive cought since 4 days before. She didn't feel out of breath. The patient presents oxygen saturation of 98% and normal auscultation. A RT-PCR from nasopharyngeal swab for COVID-19 became positive on November 4th 2020. X-Ray Thorax showed that pneumonia in pulmo dextra compatible with a typical patient pattern on SARS-CoV-2 pneumonia. (Fig 1).

In September 2020, she had tested COVID-19. A RT-PCR from nasopharyngeal swab for COVID-19 became positive. She didn't feeling

any symptoms. She is in asymptomatic case COVID-19. She declare cured after 3 weeks. Routine blood test showed normal result. A X-Ray Thorax not showed pneumonia in pulmo dextra and sinitra. Informed consent has been approved by patient.

She did not require hospitalization and has been treated with symptomatic medications, only. The patients spontaneous resolution of most acute symptoms in 12 days. The medications
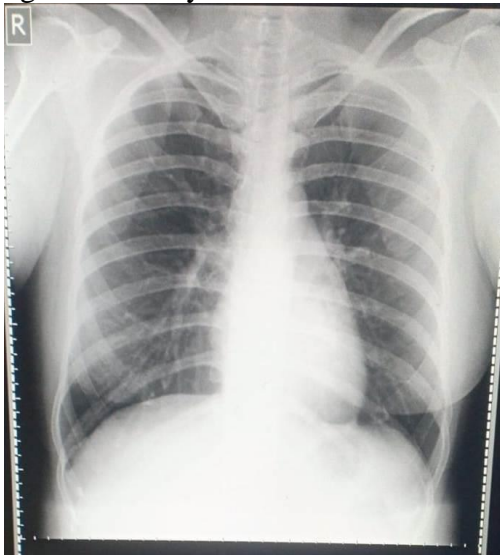

Figure 1. X-Ray Thorax at first infection

Figure 2. X-Ray thorax at reinfection

IgG and IgM antibody titers were measured using the IFA method. The results showed that the IgM level 4 weeks after the first infection was 0.04, while no IgG was formed yet. After the second infection was declared cured, the IgG antibody titer formed was 67.69 and after 4 weeks it decreased to 1.34. Meanwhile, IgM antibody experienced levels decreased from 0.27 to 0.7 after the fourth week of recovery.

Here we was present a case a patient previously recovered from COVID-19 who demonstrated symptoms and radiographical findings with slowly titer Immunoglobulin G SARS-CoV-2 in second episode infections. The first case was a symptomatic case. In the reinfection case she was feeling febris, anosmia, productive cought. But she did not present symptoms in previous infection. This case did not present with pneumonia in the first infection. However, after more than 50 days, she exhibits pneumonia after her second infection. In certain nations, like Columbia, the National Institute of Health has established 90 days as an epidemiological threshold for cases of reinfection. In addition SARS-CoV-2 confirmation by RT-PCR, whether symptomatic or asymptomatic events.

SARS-CoV-2 reinfection remains to be fully clarified. There were some report cases of patients test positive again after clinical recovery and negative PCR test.[3] Some studies, this finding was attribute to PCR false negative result discharge, SARS-CoV-2 long-term shedding and increase virus replication after clinical recovery.[4] This is the most typical explanation for actual infection that is put up, along with prolonged viral shedding and faulty testing.[5] Many cases of dynamic RT-PCR results patients clinically improved at the time of repeat positive testing, this is question like true infection. Numerous viruses show persistent genetic material in a host even after the live virus has been eliminated and symptoms have disappeared.[6, 7]

Based on assesment brief ECDC 2020 to assessing a re-infection confirmed COVID-19. Positive PCR test at second episode must assessment with epidemiological data and sequence data. Epidemiological data used to match the symptom free periodes between episodes and negative test PCR between two

episodes. Another test to determine possible reinfection is a sequence data. Sequence data belong to different genetic clades or lineages and phylogenetic is a strain local of location exposure.[8]

The protective role of antibody or T-cell-induced immunity against SARS CoV-2 is still not understood. So, antibody titer usually correlate with antiviral immunity and anti-receptor domain antibody levels are known to link to plasma viral neutralization antibody[8]. In this reinfection patient case, the level of anti-SARS-CoV-2 IgG after the first recovery status is zero or unreactive. There is another report about recovered COVID-19 patients with recurrent viral RNA exhibit lower levels of anti-receptor binding domain (RBD) of SARS-Coronavirus[9]. After evaluate the effect of specific antibodies on recurrent RNA-positive status and compared the levels of anti-SARS-CoV-2 IgG to the S, RBD, HR1–HR2, N, and M proteins in these patients during their convalescent period, the results showed that RP patients induced significantly lower levels of anti-RBD IgG than PRN patients[9]. Then, there are 3 main mechanism for reinfection: the immune response can be ineffective, strain-specific, or short-lived[10].

In the first positive COVID-19 confirmation, the clinical feature of patient is asymptomatic. However, the second positive COVID-19 confirmation, patient experience mild-symptom COVID-19 manifestation. A study noted that even if the anti-bodies do not protect from reinfection, they do protect against severe forms of the disease.[11] This reinfection/reactivation indicates that a virus-eliminating immune response to SARS-CoV-2 may be difficult to achieve[12].

Another study noted that the increases in antibodies were not always accompanied by RNA clearance and antibody may not be sufficient to clear the virus, especially in critical patient[13]. SARS-CoV-2 has been known to form escape mutation which may correspond to reduction in immunoglobulin binding capacity. Similar to many other viruses, SARS-CoV-2 exploits exosomal and extracellular vesicle cellular transport pathways for reproduction and intra-host spreading as a form of systemic virus dissemination. There are theories about potential causes for the relapse of COVID-19 infection. So, it was reasonable explanation for appearance of the viral RNA in the recovered COVID-19 patients post-negative-PCR result[12].

3. Conclusion

Reinfection represents a new clinical epidemiological challenge in COVID-19. After a patient has recovered, a one-month period of antibody monitoring is required for serology testing in order to monitor for the chance of reinfection in patients with low antibody levels.

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