Confirmed Delta Variant COVID-19 Infection at A Single Centre Tertiary Hospital: A Case Series

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ABSTRACT

SARS-CoV-2 continues to mutate with the emergence of new variants. Variant B.1.617.2 (Delta) is a variant of concern with evidence of increased transmission, more severe disease, decreased effectiveness of treatment or vaccines, or failure of diagnostic detection. In this article, we report on the clinical and biological picture of the first confirmed delta variant COVID-19 infection in Indonesia. From May 31 to June 17, we identified ten cases with confirmed delta variant COVID-19 infection admitted to a tertiary academic hospital in Jakarta. All subjects that have been vaccinated presented with mild-moderate disease. Most patients present with initial respiratory complaints, without radiological abnormalities on chest x-ray examination, and an increase in C-reactive protein. Seven out of ten patients have been vaccinated; the three patients who had not been vaccinated experienced severe COVID-19 symptoms, two of whom died. Due to the increased transmission of this variant, we recommend vaccination, wearing a mask, and social distancing to reduce the impact of infection with delta variant B.1,617.2.

Keywords**:** *COVID-19, delta variant, vaccination status, variant of concern.*

INTRODUCTION

Since the initial detection of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), more than 281 million cases of Covid-19 have been confirmed worldwide.[1] The evolution of SARS-CoV-2 is characterized by the emergence of new genetic lines and several mutations that affect the infectivity and antigenicity of the virus.[2] SARS-CoV-2 continues to mutate with the emergence of new variants.[3] The United Stated SARS-CoV-2 Interagency Group (SIG) has established a classification system including the Variant Being Monitored, Variant of Interest, Variant of Concern, and Variant of High Consequence.

Variant B.1.617.2 (Delta) is a variant of concern, that is, a variant with evidence of increased transmission, more severe disease, decreased effectiveness of treatment or vaccines, or failure of diagnostic detection.[4] Centers for Disease Control and Prevention (CDC) has stated that the variant Delta is estimated to be around 60% more infectious than Alpha variants, the basic reproduction rate of between 5 and 8.[3] In Indonesia, the Delta variant is also thought to have spread rapidly, in part because of low initial vaccination coverage.

Concerns have also been raised about the vaccine's effectiveness against SARS-CoV-2, in particular the Delta variant. Cases of infection in vaccinated individuals (breakthrough infection) are reported in this variant of interest; however,

patients with vaccine breakthrough infection were more likely to be asymptomatic or have milder symptoms, with a milder course of the disease. The effect of delta variant infection on the severity of the clinical manifestations of COVID-19 in susceptible populations, including the elderly and pregnant persons; and populations with comorbid or chronic conditions is unclear.[5]

In this article, we report on the clinical and biological picture of the first confirmed delta variant COVID-19 infection in Indonesia, which occurred in a tertiary hospital, and its dynamics related to clinical manifestations, disease course, and vaccination status of study subjects.

CASE ILLUSTRATION

From May 31 to June 17, we identified ten cases with confirmed delta variant COVID-19 infection admitted to a tertiary academic hospital in Jakarta. Subjects included three patients with moderate-to-severe disease resulting in immediate care in the cardiac intensive care unit (ICCU) and seven patients with mild disease diagnosed early in the course of infection. None of the subjects had a history of traveling to other countries with known delta variant transmission, however, seven subjects had contact with someone known to be infected with COVID-19. The most common symptoms were fever and cough in 9 subjects. Seven subjects with mild disease were fully vaccinated with the CoronaVac vaccine, covering two doses given over two to four weeks.

Table 1 shows the laboratory and radiological findings at the initial hospital visit. At the initial visit, an increase in C-reactive protein was typical, with a mean count of 8.9. Severe uremia, elevated D-dimer and leukocyte levels, and elevated troponin concentrations were found in patients admitted to the ICCU. All ICCU patients had complaints of cardiac involvement and underwent echocardiography and coronary angiography. One patient was diagnosed with a left atrial mass on echocardiography with normal coronary angiography results. One patient was diagnosed with coronary artery disease of three coronary vessels. One patient underwent single stent placement during percutaneous coronary intervention.

Table 1. Clinical Characteristics of Subjects.

Parameters	(N=10)
Mean age (median)	34.5
Gender, n (%)	
Male	2 (20.0)
Female	8 (80.0)
Clinical degree of disease, n (%)	
Mild-moderate	7 (70.0)
Severe-critical	3 (30.0)
Comorbid conditions, n (%)	
Hypertension	3 (30.0)
Asthma	1 (10.0)
Chronic kidney disease	1 (10.0)
Diabetes mellitus	1 (10.0)
Heart failure	1 (10.0)
Coronary artery disease	1 (10.0)
Without comorbidity	3 (30.0)
Symptoms, n (%)	
Fever	7 (70.0)
Shortness of breath	2 (20.0)
Cough	8 (80.0)
Sore throat	4 (40.0)
Headache	2 (20.0)
Diarrhea	1 (10.0)
Nasal congestion	6 (60.0)
Muscle pain	2 (20.0)
Chest pain	2 (20.0)
Length of stay in hospital, mean (SD)	11.1 (5.8)
Vaccination status, n (%)	
Vaccinated	7 (70.0)
Unvaccinated	3 (30.0)
Laboratory results	
Lymphocyte counts, 10^3 cells/uL, mean (SD)	1.23 (0.69)
Hemoglobin, g/L, mean (SD)	11.72 (1.52)
Thrombocytes, 10^3 cells/L (median)	267
C-reactive protein, mg/L (median)	8.9
d-Dimer, ug/L (median)	505
Thoracal x-ray findings, n (%)	
Unilateral lung opacity	1 (10.0)
Bilateral lung opacity	1 (10.0)
Bilateral pleural effusion	1 (10.0)
Inhomogeneous consolidation and bronchiectasis	1 (10.0)
No radiological abnormalities	6 (10.0)
Intensive unit care (ICCU), n (%)	3 (30.0)
Outcome, n (%)	
Mechanical ventilation	1 (10.0)
Death	2 (20.0)
Recovery	8 (80.0)

Chest radiographs were obtained for each subject. All patients admitted to the ICCU showed bilateral lung opacities. Unless indicated, we do not routinely examine markers of infection with influenza, respiratory viruses, or other respiratory viral panels. Blood samples from 3 patients were sent for bacterial culture, and one sample was positive for Staphylococcus aureus bacteria growth. Clinical samples for Covid-19 diagnostic tests were obtained following WHO

guidelines, taken from nasopharyngeal swabs.[6] As part of active genomic surveillance, whole-genome sequencing was performed for all samples with confirmed SARS-CoV-2 detected by RT-PCR. Lineage B.1.617.2 was determined as the SARS-CoV-2 variant for these ten cases.

One patient required invasive mechanical ventilation, with the Pao2:Fio2 ratio consistent with severe ARDS. Tracheostomy was not performed. Two patients received remdesivir as antiviral therapy. None of the subjects received therapy with hydroxychloroquine, lopinavir-ritonavir, systemic glucocorticoids, ivermectin, or tocilizumab. In subjects not admitted to the ICCU, favipiravir was prescribed for eight days.

All subjects were monitored for a minimum of 14 days of follow-up. Two patients died, one patient was discharged from the ICCU but was re-hospitalized for another diagnosis in a different treatment episode, and seven patients were discharged from inpatient/isolation. The mean duration of isolation among living patients was eight days (standard deviation 1.8), and the mean length of stay for ICCU patients was 17 days (standard deviation 7). The duration of mechanical ventilation was six days in the only patient receiving mechanical ventilation.

DISCUSSION

The subjects in this report primarily complained of respiratory symptoms. The duration of symptoms before treatment varied, between 1 day and one week. The most common symptoms were fever, cough, and nasal congestion, consistent with symptoms reported in the initial cohort in China.[7] Lymphocytopenia is common, as noted by several reviews and meta-analyses regarding lymphocyte counts and cytokine storm in patients with COVID-19.[8]

Three out of ten subjects were admitted to the ICCU. Two of the three patients admitted to the ICCU had chronic disease prior to infection, consistent with a poorer outcome in patients with underlying comorbidities.[9] Lower respiratory tract bacterial coinfection was only identified in blood cultures of one of the ICCU patients, similar to a study by Langford et al., stating that only a small proportion of COVID-19 patients had concomitant bacterial infections. Coinfection with bacteria is common in critically ill patients.[10]

Like other RNA viruses, the SARS-CoV-2 virus frequently undergoes mutations during the replication process due to the absence of a mismatch repair mechanism in the virus. Mutations, in essence, make the virus more infectious and more challenging to identify and isolate properly.[2] The delta variant or variant B.1,617.2 has spike mutations G142D, T19R, F157del, E156G, R158del, L452R, D614G, P681R, T478K, and D950 N relative to Wuhan-1 D614G 118.[11] Our genome sequencing results indicate that the delta variant has reached the stage of community transmission in Indonesia.

Our study involved seven vaccinated subjects, suggesting that vaccination does not protect against all infections, particularly against variants of concern. However, vaccinated subjects had better outcomes compared to non-vaccinated subjects; none of the patients admitted to the ICCU had been vaccinated. Vaccinated subjects received an inactivated CoronaVac vaccination, which showed a lower degree of neutralization against the SARS-CoV-2 virus.[12] Studies have estimated the Oxford–AstraZeneca, Pfizer–BioNTech, and Moderna COVID-19 vaccines to effectively reduce the risk of SARS-CoV-2 infection and hospitalization in persons infected with the Delta variant.[13,14]

CONCLUSION

In our study of cases of delta variant COVID-19 infection in an Indonesian tertiary academic hospital, we found that all samples that have been vaccinated presented with mild-moderate disease. Most patients present with initial respiratory complaints, without radiological abnormalities on chest x-ray examination, and an increase in C-reactive protein. Seven out of ten patients have been vaccinated; the three patients who had not been vaccinated experienced severe COVID-19 symptoms, two of whom died. Due to the increased transmission of this variant, we recommend vaccination, wearing a mask, and social distancing to reduce the impact of infection with delta variant B.1,617.2.

STATEMENT OF ETHICS

The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013).

CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

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