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EDITORIAL

JN.1 COVID-19: Variant of interest

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ABSTRACT

Corona Virus Disease-19 (COVID-19) is an acute respiratory syndrome caused by the Coronavirus 2 (SARS-CoV-2) virus. WHO groups the SARS-CoV-2 virus into two categories, namely a variant of interest (VOI) and a variant of concern (VOC). The VOI category is given if there is a new mutation with predictable phenotypic implications and must be fulfilled by one mutation that causes local transmission or causes multiple clusters or is detected in several countries. In September 2023, a new variant of COVID-19 was detected in the United States, namely JN.1 as VOI. This variant is a variation of the BA.2.86 variant with the only difference being the mutation of 1 spike protein, namely the addition of the L455S protein in the JN.1 variant. This variant has the potential to evade the immune system. Globally, there has been a rapid increase in the number of sufferers, especially in 3 WHO regions, namely America (AMR), West Pacific (WPR) and Europe (EUR). However, the effectiveness of the monovalent vaccine against this variant can still protect sufferers. Several studies show that the risk of hospitalization is low in the case of elderly and young patients.

Keywords: COVID-19; Variant JN.1; spike protein; variant BA.2.86.

ABSTRAK

Corona Virus Disease-19 (COVID-19) adalah sindrom pernafasan akut yang disebabkan oleh virus Coronavirus 2 (SARS-CoV-2). WHO mengelompokkan virus SARS- CoV-2 menjadi dua kategori, yaitu *variant of interest* (VOI) dan *variant of concern* (VOC). Kategori VOI diberikan jika terdapat mutasi baru dengan implikasi fenotipenya bisa diduga dan harus terpenuhi satu mutasi yang menyebabkan transmisi lokal atau menyebabkan multipel klaster atau terdeteksi di beberapa negara. Pada September 2023 terdeteksi varian baru COVID 19 di Amerika Serikat, yaitu JN.1 sebagai VOI. Varian ini adalah variasi dari varian BA.2.86 dengan perbedaan hanya pada mutase 1 spike protein yaitu tambahan protein L455S pada varian JN.1. Varian ini memiliki potensi untuk menghindar dari system kekebalan tubuh. Secara global telah terjadi peningktan jumlah penderita secara pesat terutama di 3 wilayah WHO yaitu Amerika (AMR), Pasifik Barat (WPR) dan Eropa (EUR). Namun efektivitas vaksin monovalent terhadap varian ini masih dapat melindungi penderitanya. Beberapa penelitian menunjukkan bahwa risiko yang rendah untuk perawatan di rumah sakit pada kasus penderita lanjut usia dan usia muda.

Kata Kunci: COVID-19; Varian JN.1; spike protein; varian BA.2.86.

The SARS-CoV-2 virus is the virus that causes Corona Virus Disease-19 (COVID-19). WHO groups the SARS-CoV-2 virus into two categories, namely a variant of interest (VOI) and a variant of concern (VOC). [1,2] The VOI category is given if there is a new mutation with predictable phenotypic

implications and one mutation that causes transmission must be fulfilled. local or causes multiple clusters or is detected in several countries. The VOI category can be upgraded to VOC if several conditions are met. First, this variant has increased transmission, epidemiologically it is faster. Second, this variant has higher virulence, resulting in increased severity in the host, and can even cause death. Third, this variant reduces the effectiveness of health protocols, diagnostic tools, vaccines, and therapy. On May 31, 2021, WHO designated 4 variants of SAR-CoV-2 as VOC, namely the Alpha (B.1.1.7), Beta (B.1.351), Gamma (P1), and Delta (B.1.671.2) variants.[2,3]

Corona Virus Disease-19 is an acute respiratory syndrome caused by the Coronavirus 2 (SARS-CoV-2) virus which has high transmission power. The spread of COVID-19 occurs through aerosol transmission of particles produced when an infected person exhales, speaks, makes noise, sneezes, or coughs. The virus can be spread by people who do not show symptoms so that person does not know that they are infected. Particles containing viruses can travel distances greater than 6 feet, especially indoors and in dry conditions (relative humidity below 40%).[4,5]

Coronaviruses are pleomorphic with a tendency to be round. It has an average particle diameter of 125 nm with a characteristic structure in the form of an envelope and spike-like protrusions. The envelope in the structure of the Coronavirus is a double lipid layer consisting of proteins that make up the membrane (M), envelope (E), and spike (S). The E and M proteins are very important in forming the envelope and maintaining the structure of the Coronavirus. This virus structure has an average of 74 spike proteins (S) on its surface. In the envelope is stored the nucleocapsid (N) protein which protects the genetic information of the viral RNA.[6]

On August 25, 2023, a new variant sample was obtained, namely JN.1. This variant is categorized as a variant of interest (VOI).[7] This variant was first detected in September 2023 in the United States.[8] This variant is a variation of the BA.2.86 variant which is often found in the United States. These two variants are very similar, the only difference is the mutation of 1 spike protein, namely the addition of the L455S protein in the JN.1.7 variant. The BA.2.86 variant has more than 30 mutations in the spike protein (S) and has the potential to evade the immune system. The JN.1 variant, apart from 1 mutation in the spike protein, also has 3 mutations in the non-S protein.[9]

As of December 16, 7344 JN.1 sequences had been collected to GISAID (Global Initiative Sharing All Influenza Data) from 41 countries, with the countries with the largest number of sequences being France (20.1%), the United States (14.2%), Singapore (12.4%), Canada ((6.8%), England (5.6%) and Sweden (5.0%). Globally there has been a rapid increase in the number of sufferers, especially in 3 WHO regions, namely America (AMR), West Pacific (WPR), and Europe (EUR). The largest increase was in the WPR area, from 1.2% (in the 44th week of observation) to 65.6% (in the 48th week of observation). Still under research regarding the ability to spread JN.1. This variant has a relative growth of 2.3 times compared to variant EG.5.1.1. Research using pseudotype JN.1. reports the ability of this variant to evade the immune system, especially against class 1 neutralizing antibodies, so that it will cause a decrease in affinity for ACE2.[10] The effectiveness of monovalent vaccines against this variant can still protect the sufferer. However, vaccine protection certainly differs between countries, this depends on the immune background of the population.[7]

A study in Belgium reporting on patients aged over 65 years did not show a difference in increased hospitalization compared to the non-BA.2.86 variant. Pre-elementary studies in

Singapore show that the BA.2.86 variant has a lower risk of being hospitalized, especially in cases of older and younger sufferers.[10]

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