Pusat Informasi Kesehatan Masyarakat >> S3 - Disertasi

Pengaruh Pajanan PM2,5, NO2, O3, Kondisi Iklim, Polimorfisme ACE rs4646994 dan ACE2 rs2285666 Terhadap Derajat COVID-19

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Abstrak

Pandemi Coronavirus diseases 2019 (COVID-19) membuat krisis kesehatan global. Pajanan lama PM, NO2, CO, O3 berefek negatif terhadap pasien COVID-19. Beberapa penelitian menunjukkan hubungan signifikan kerentanan genetik terhadap efek polutan udara terhadap penyakit, seperti pasien COVID-19 dengan polimorfisme ACE rs4646994 atau ACE2 rs2285666 dapat memiliki derajat lebih berat. Tujuan penelitian ini untuk menganalisis pengaruh pajanan PM2,5, NO2, O3, kondisi iklim, polimorfisme ACE rs4646994 dan ACE2 rs2285666, usia, IMT, serta komorbid hipertensi, penyakit jantung, asma dan DM terhadap derajat COVID-19. Data lingkungan didapatkan dari BMKG dan subjek berdomisili radius < 3 km dari Stasiun Metereologi Kemayoran dengan membagi menjadi kelompok pasien derajat asimtomatik-ringan dan sedang-berat. Pemeriksaan polimorfisme diambil dari sampel swab bukal. Data dilakukan analisis regresi logistik.

Hasil penelitian ini mendapatkan pasien COVID-19 dengan polimorfisme ACE2 rs2285666 genotip AA akan berisiko 9,128 kali mengalami derajat lebih berat. Polimorfisme ACE rs4646994, pajanan PM2,5, NO2 serta komorbid tidak berhubungan signifikan dengan derajat COVID-19. Pajanan O3, temperatur rendah, kelembaban rata-rata tinggi, sedikit sinar matahari, dan IMT tinggi secara signifikan memperberat COVID-19 pada analisis bivariat. Penelitian ini menyimpulkan polimorfisme ACE2 rs2285666 genotip AA merupakan faktor risiko memberatnya derajat COVID-19. Pajanan O3, IMT, temperatur minimum, temperatur rata-rata, kelembaban rata-rata dan lama penyinaran matahari dapat berperan terhadap derajat COVID-19.
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Coronavirus Disease 2019 (COVID-19) pandemic created a global health crisis. Prolonged exposure to PM, NO2, CO, O3 has a negative effect on COVID-19 patients. Several studies have shown a significant relationship between genetic susceptibility to the effects of air pollutants on disease, such as COVID-19 patients with ACE rs4646994 or ACE2 rs2285666 polymorphisms can have a more severe degree. The aim of this study was to analyze the effect of exposure to PM2.5, NO2, O3, weather conditions, ACE rs4646994 and ACE2 rs2285666 polymorphisms, age, BMI, and comorbidities (hypertension, heart disease, asthma, and DM) on the degree of COVID-19. Environmental data were obtained from the BMKG and the subjects were domiciled within a radius of <3 km from the Kemayoran Meteorological Station by dividing the patients into asymptomatic-mild and moderate-severe groups. Polymorphism examination was taken from a buccal swab sample. Logistic regression was used to analyze the data.

The results of this study found that COVID-19 patients with the polymorphism ACE2 rs2285666 genotype AA would be 9.128 times more at risk of experiencing a more severe degree. Polymorphism ACE rs4646994, exposure to PM2.5, NO2 and comorbidities were not significantly related to the degree of

COVID-19. O3 exposure, low temperature, high average humidity, fewer durations of sunlight, and high BMI significantly aggravate COVID-19 in bivariate analysis. This study concluded that the polymorphism ACE2 rs2285666 genotype AA is a risk factor for the severity of COVID-19. Exposure to O3, BMI, minimum temperature, average temperature, average humidity, and duration of sunlight can play a role in the degree of COVID-19.