ABSTRAK

ANALISIS KADAR INTERLEUKIN-6 (IL-6) DAN PLASMINOGEN ACTIVATOR INHIBITOR-1 (PAI-1), SEBAGAI FAKTOR RESIKO KEJADIAN KEMATIAN PASIEN COVID-19

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Latar Belakang

COVID -19 menyebabkan komplikasi mematikan berupa kerusakan paru-paru akut yang disebabkan terjadinya badai sitokin. Interleukin-6 (IL-6) dan Plasminogen Activator Inhibitor-1 (PAI-1) adalah dua protein yang berperan penting dalam respons imun dan peradangan. IL-6 merupakan sitokin pro-inflamasi yang diproduksi oleh sel imun, sedangkan PAI-1 adalah protein yang menghambat aktivasi plasmin, enzim yang berperan dalam pemecahan bekuan darah. Tingkat PAI-1 yang tinggi dapat meningkatkan risiko penggumpalan darah, komplikasi serius pada pasien COVID-19. Diduga kuat bahwa IL-6 dan PAI-1 dapat memicu peningkatan sel inflamasi, kerusakan jaringan, dan kematian pada infeksi SARS-CoV-2.

Metode

Penelitian *Prospective Cohort* pada pasien COVID-19 yang merupakan bagian dari penelitian payung COVID-19. Penelitian dilaksanakan pada bulan Agustus 2020 hingga Januari 2021 melibatkan 72 subjek yang terinfeksi COVID-19 dengan RT PCR positif yang memenuhi kriteria inklusi.

Hasil

Dari 72 sampel penelitian didapatkan 13 subjek meninggal dunia dan 59 subjek bertahan hidup. Penelitian menunjukkan didapatkan perbedaan signifikan tingginya kadar IL-6 (p=0,022) terhadap kematian pasien COVID-19, namun kadar PAI-1 (p=0,855) tidak menunjukkan perbedaan signifikan dengan kematian pasien COVID-19. Pada penelitian ini menunjukan nilai kadar IL-6 lebih dari 160 pg/mL dapat digunakan untuk mengidentifikasi pasien dengan faktor risiko kematian, kadar IL-6 dan PAI-1 menunjukkan tidak secara bersama - sama sebagai faktor resiko terhadap kematian COVID-19. Kadar IL-6 paling tinggi pada derajat Kritis COVID-19 (mean 245,9), sedangkan kadar PAI-1 paling tinggi didapatkan pada derajat ringan COVID-

19 (mean 4,4). Rasio PaO2/FiO2 (p=0,023) terbukti kuat sebagai perancu yang mempengaruhi kematian pada penelitian ini.

Kesimpulan

Kadar IL-6 yang tinggi merupakan sebagai faktor risiko kematian COVID-19. Kada PAI 1 bukan merupakan faktor resiko kematian COVID-19. Rasio PaO2/FiO2 merupakan faktor resiko perancu yang mempengaruhi kematian COVID-19.

Kata Kunci : COVID-19, IL-6, PAI-1, Kematian

ABSTRACT

ANALYSIS OF RISK FACTORS LEVELS OF INTERLEUKIN-6 (IL-6) AND PLASMINOGEN ACTIVATOR INHIBITOR (PAI-1) WITH MORTALITY OF COVID - 19 PATIENTS

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Background

COVID-19 causes deadly complications, including acute lung injury caused by cytokine storm. Interleukin-6 (IL-6) and Plasminogen Activator Inhibitor-1 (PAI-1) are two proteins that play important roles in the immune response and inflammation. IL-6 is a pro-inflammatory cytokine produced by immune cells, while PAI-1 is a protein that inhibits the activation of plasmin, an enzyme that plays a role in clot breakdown. High PAI-1 levels can increase the risk of thrombosis, a serious complication in COVID-19 patients. It is thought that IL-6 and PAI-1 may trigger the increase of inflammatory cells, tissue damage, and death in SARS-CoV-2 infection.

Methods

Prospective Cohort study in COVID-19 patients which is a part of the COVID-19 joint research. The research was conducted from August 2020 to January 2021 involving 72 subjects with positive RT PCR positive COVID-19 infection who met the inclusion criteria.

Results

From the 72 research samples, 13 subjects died and 59 subjects survived. The study showed that a significant difference in IL-6 levels (p=0.022) was associated with death in COVID-19 patients, but PAI-1 levels (p=0.855) did not show a significant difference with death in COVID-19 patients. In this study, it was shown that a IL-6 level of more than 160 pg/mL can be used to identify patients with a risk factor for death, and that IL-6 and PAI-1 levels do not together act as a risk factor for COVID-19 death. IL-6 levels were highest in the critical stage of COVID-19 (mean 245.9), while PAI-1 levels were highest in the mild stage of COVID-19 (mean 4.4). PaO2/FiO2 ratio (p=0.023) was strongly proven as a confounding factor that affects death in this study.

Conclusion

High IL-6 levels are a risk factor for COVID-19 mortality. PAI-1 levels are not a risk factor for COVID-19 mortality. PaO2/FiO2 ratio is a confounding risk factor that affects COVID-19 mortality.

Key words

COVID-19, Il-6, PAI-1, , Mortality