Hubungan antara Faktor Klinis dan Laboratoris Saat Admisi dengan Kadar SST2 sebagai Penanda Fibrosis Jantung 12 Minggu Pasca Infeksi COVID-19 pada Pasien dengan Komorbid Kardiovaskular = Association between Clinical and Laboratory Factors on Admission with ST2 Levels as a Marker Of Cardiac Fibrosis 12 Weeks After COVID-19 Infection in Patient with Cardiovascular Comorbid

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Abstrak

Latar Belakang : Infeksi COVID-19 telah diketahui masih dapat menyebabkan gejala sampai 90 hari dan bahkan lebih, meski infeksi akutnya telah berlalu. Hal ini disebabkan karena adanya fenomena sindroma pasca COVID-19. Mekanisme kejadian tersebut sampai saat ini masih belum diketahui pasti. Hal tersebut diduga kuat akibat adanya fibrosis di beberapa organ, terutama jantung dan paru. Sementara itu, beberapa studi telah menyebutkan bahwa sST2 merupakan penanda fibrosis jantung. Meskipun demikian, sampai saat ini belum ada penelitian yang mencoba mengetahui faktor-faktor apa saja yang memiliki hubungan dengan kejadian fibrosis pasca infeksi COVID-19. Kadar sST2 pada pasien komorbid kardiovaskular tanpa COVID-19 dan populasi orang sehat, khususnya di Indonesia juga belum diketahui.

Tujuan : Mengetahui perbandingan kadar sST2 pada pasien komorbid kardiovaskular 12 minggu pasca infeksi COVID-19 dengan pasien komorbid kardiovaskular tanpa COVID-19 dan populasi orang sehat, serta hubungannya dengan faktor-faktor admisi.

Metode : Penelitian ini merupakan studi observasional potong lintang. Kadar sST2 pada pasien 12 minggu pasca infeksi COVID-19 dibandingkan dengan komorbid kardiovaskular akan dibandingkan dengan kelompok kontrol, yaitu kontrol 1 yang merupakan pasien komorbid kardiovaskular tanpa COVID-19 dan kontrol 2 yang merupakan populasi orang sehat. Kelompok kontrol dipilih menggunakan metode matching. Hubungan faktor klinis dan laboratoris saat dengan kadar sST2 pada pasien 12 minggu pasca infeksi COVID-19 dianalisis menggunakan analisis multivariat.

Hasil : Terdapat 162 subjek yang menyelesaikan rangkaian penelitian yang terdiri atas 100 subjek dengan penyintas COVID-19 disertai komorbiditas kardiovaskular (kelompok kasus), 31 subjek dengan komorbiditas kardiovaskular tanpa COVID-19 (kelompok kontrol 1), dan 31 subjek sehat tanpa riwayat COVID-19 dan komorbiditas kardiovaskular (kelompok kontrol 2). Ketiga kelompok memiliki karakteristik yang sama. Terdapat perbedaan signifikan rerata nilai sST2 antara kelompok kasus dibandingkan kontrol 1 dan kontrol 2 (2786 ± 73 vs 2666 ± 162 pg/l, p <0.001 dan 2786 ± 73 vs 2517.15 ± 321 pg/l, p < 0.001), serta kontrol 1 dibandingkan kontrol 2 (2666 ± 162 pg/l vs 2517.15 ± 321 pg/l, p < 0.001). Analisis multivariat menunjukkan PaO2 (p < 0.001) dan nilai CT (p = 0.04) memiliki hubungan dengan kadar sST2 pada pasien 12 minggu pasca infeksi COVID-19.

Kesimpulan : Terdapat perbedaan signifikan antara kadar sST2 sebagai penanda fibrosis jantung pada ketiga kelompok subjek penelitian, dengan kadar sST2 lebih tinggi pada subjek dengan penyintas COVID-19 disertai komorbiditas kardiovaskular. Terdapat hubungan PaO2 dan nilai CT saat admisi dengan kadar sST2. .....Background : Recent findings showed that symptoms associated with COVID-19 infection may persist up to 90 days even after the acute disease period has passed. This condition is now termed as post COVID-19 syndrome. Several pathophysiologic mechanisms of this event had been proposed, all of which still needed further elaboration. One of the proposed mechanisms involves fibrotic processes in several organs, especially heart and the lungs. SST2 has been suggested as a novel biomarker for cardiac fibrosis. However data are still needed to further elucidate the factors which are associated with the incidence of fibrosis post COVID-19 infection. Furthermore, data regarding sST2 levels in patients with cardiovascular comorbidities and in healthy subjects are still limited.

Objective : Knowing the differences on sST2 levels between subjects with cardiovascular comorbidities 12 weeks post COVID-19 infection, those without history of COVID-19 but with cardiovascular comorbidities, and healthy population, as well as knowing its relationship with admission factors.

Methods : This study is a cross-sectional observational study on patients 3 months after COVID-19 infection presented with cardiovascular comorbidities. Age and sex-matched control groups were used as comparison. The results were compared with a group without history of COVID-19 and healthy populations. Relationship between admission factors was assessed using multivariate analysis

Results : 162 subjects completed the study series, consisting of 100 subjects with COVID-19 survivors with cardiovascular comorbidities (case group), 31 subjects with cardiovascular comorbidities without COVID-19 (control group 1), and 31 healthy subjects without a history of COVID-19 and cardiovascular comorbidities (control group 2). All three groups had similar characteristics. There was a significant difference in the mean sST2 value between the case groups compared to control 1 and control 2 (2786 ± 73 vs 2666 ± 162 pg/l, $p < 0.001$ and 2786 ± 73 vs 2517.15 ± 321 pg/l, $p < 0.001$ respectively), and control 1 compared to control 2 (2666 ± 162 pg/l vs 2517.15 ± 321 pg/l, $p < 0.001$). Multivariate analysis revealed PaO2 ($p < 0.001$ and CT values ($p = 0.04$) as admission factor associated with increased sST2 3 months after initial COVID-19 infection.

Conclusion : SST2 levels were found to be significantly different between the three groups, with the highest level on the case group (subjects with history of COVID-19 and cardiovascular comorbidities). Factors upon admissions which include Arterial oxygen partial pressure (PaO2) ($p < 0.001$) and CT value ($p = 0.04$) were found to be associated with increased sST2 levels.