INTISARI

Latar Belakang: Penyakit jantung bawaan (PJB) mewakili sebagian besar kelainan kongenital pada anak, sedangkan Down syndrome (DS) adalah kelainan kromosomal paling umum di dunia. Diketahui bahwa baik pada anak PJB dan DS terjadi peningkatan sitokin inflamasi seperti TNF-α, di sisi lain RAGE merupakan reseptor pemukaan sel multiligand yang memperantarai reaksi inflammasi dan dapat ditemukan pada berbagai macam penyakit. Bentuk larut dari RAGE, yaitu sRAGE seringkali diteliti sebagai terapi potensial karena sifatnya sebagai reseptor pengecoh dari RAGE.

Tujuan: Melihat potensi sRAGE dan TNF-α di sirkulasi darah perifer sebagai penanda biologis PJB pada pasien non-DS maupun pasien DS.

Metode: Penelitian ini merupakan penelitian deskriptif analitik dengan jenis potong lintang. Sampel merupakan darah tepi pasien poliklinik kesehatan anak RSUP Dr. Sardjito pada periode Desember 2021-Mei 2022 yang memenuhi kriteria inklusi. Hubungan antar variabel dinyatakan dengan interval kepercayaan 95% dan tingkat kemaknaan statistik p <0,05. Dilakukan juga pehitungan ROC untuk melihat potensial sRAGE dan TNF-α sebagai penanda biologis.

Hasil: Didapatkan 27 pasien PJ dengan perincian 13 (48.1%) DS dan 14 (51.9%) non-DS. Diketahui kelompok usia terbanyak 0-24 bulan (66.7%), dan sebagian besar PJB merupakan sianotik (66.7%) dan tanpa PH (59.3%). Dua puluh enam (96.3%) subjek belum mendapatkan tindakan koreksi, namun 23 (85.2%) telah mendapatkan terapi obat anti gagal jantung. Area under the curve (AUC) dari sRAGE dan TNF-α untuk mendiagnosis CHD pada DS berturut-turut 0.692 (95% CI 1.11 - 4.89) dan 0.621 (95% CI 1.58 - 4.78). Cutoff optimal sebesar 357.5 pg/mL (sensitivity 53.8%, specificity 85.7%) didapatkan untuk sRAGE, sedangkan sebesar 113.55 ng/L (sensitivity 38.5%, specificity 100%) untuk TNF-α.

Simpulan: sRAGE dan TNF-α mempunyai potensi untuk dijadikan penanda biologis PJB pada anak DS.

Kata kunci: sRAGE, TNF-α, Down syndrome, Penyakit jantung bawaan

ABSTRACT

Background: Congenital Heart Disease represents the most common congenital disorder found in children, while Down syndrome (DS) is globally the most common chromosomal disability and is also often accompanied with CHD. It is known that in both CHD and DS, there is an increase of inflammatory cytokines such as TNF-α. On the other hand, RAGE is a multi-ligand cell surface receptor that mediates inflammation in a myriad of diseases. The soluble form of RAGE, known as sRAGE is well studied for it's potential as a decoy for RAGE.

Objective: To evaluate the potential of both sRAGE and TNF-α to be utilized as biomarkers for CHD in both DS and non-DS children.

Methods: We performed an analytic descriptive study utilizing a cross-sectional design. Blood samples were drawn from patients attending the child-health outpatient clinics of RSUP Dr. Sardjito during the time periode of December 2021 to May 2022 that adhered to our inclusion criteria. Association between variables were presented using 95% confidence interval, and p value of <0.05 to determine significance. An ROC was performed to evaluate the potential of both sRAGE and TNF-α as biomarkers.

Results: Twenty-seven CHD patients were included, consisting of 13 (48.1%) DS dan 14 (51.9%) non-DS children. The highest age-group being from 0-24 months of age (66.7%). A greater percentage of CHD were of a cyanotic type (66.7%) without presence of pulmonary hypertension (59.3%). Twenty-three subjects (85.2%) were already on anti-heart failure drugs, but 96.3% had not been put through any type of surgical correction. The area under the curve (AUC) of sRAGE and TNF-α to assess CHD in DS was 0.692 (95% CI 1.11 - 4.89) and 0.621 (95% CI 1.58 - 4.78) consecutively. An optimal cut-off point of 357.5 pg/mL (sensitivity 53.8%, specificity 85.7%) was determined for sRAGE, and 113.55 ng/L (sensitivity 38.5%, specificity 100%) for TNF-α in DS children.

Conclusion: Both sRAGE and TNF-α have possible potential to be utilized as biomarkers of PJB especially for children with DS.

Keywords: sRAGE, TNF-α, Down syndrome, congenital heart disease