

Research Article

The Role of Soluble Costimulatory Molecules as the Biomarkers for Aging Predictors

Peran Molekul Kostimulator Terlarut sebagai Biomarker untuk Prediktor Penuaan

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ABSTRACT

This study aimed to determine the role of the soluble costimulatory molecules in aging and the association with the presence of comorbid in aged individuals. Thirty-two elderly and twenty healthy subjects were included in this study. The soluble costimulatory molecules sCD28, sCD80, sCD86, sCD163, and sCTLA4 were measured using ELISA. The presence of comorbid was documented from medical records. Charlson Comorbidity Index (CCI) was measured to evaluate the survival/mortality risk for the subjects. The levels of the majority of soluble costimulatory molecules significantly increased in the elderly participants, while the level of sCD86 was comparable. There were weak positive correlations between the subject's age and levels of sCD28 ($R=0.214$, $p=0.048$), sCTLA4 ($R=0.238$, $p=0.041$), and sCD80 ($R=0.317$, $p=0.012$). sCD80 were discovered to be the best to predict immune aging in the elderly with AUC 0.71 [0.57-0.86], sensitivity 53.1%, specificity 80.0%, and cut off 129ng/ml. Most of the elderly participants had at least one comorbid, in which approximately 25.0% and 3.1% of the subjects were classified as mild and moderate CCI. Multivariate analysis showed that comorbidities in elderly individuals have been associated with levels of sCTLA4 ≥ 26.5 ng/ml and sCD80 ≥ 129.0 ng/ml. Furthermore, subjects with comorbid (CCI ≥ 1) were associated with sCD80 ≥ 129.0 ng/ml (OR 12.44 [95% CI 1.32–117.03], $p=0.027$). Considering these results, sCD28, sCTLA4, and sCD80 can be developed as biomarkers for predicting immune aging and elderly comorbidities, respectively.

Keywords: Comorbidities, elderly, immune aging, soluble costimulatory molecules

ABSTRAK

Penelitian ini bertujuan untuk mengetahui peran molekul kostimulatori terlarut dalam penuaan dan hubungannya dengan adanya komorbiditas pada individu lanjut usia. Tiga puluh dua individu lanjut usia dan dua puluh subjek sehat dilibatkan dalam penelitian ini. Molekul kostimulatori terlarut sCD28, sCD80, sCD86, sCD163 dan sCTLA4 diukur menggunakan ELISA. Adanya komorbiditas didokumentasikan dari catatan medis. *Charlson Comorbidity Index (CCI)* diukur untuk mengevaluasi risiko kelangsungan hidup/kematian subjek. Sebagian besar kadar molekul kostimulatori terlarut didapatkan mengalami peningkatan kadar yang signifikan pada individu lanjut usia, sedangkan kadar dari sCD86 sebanding. Terdapat korelasi positif yang lemah antara usia dan kadar sCD28 ($R=0.214$, $p=0.048$), sCTLA4 ($R=0.238$, $p=0.041$), dan sCD80 ($R=0.317$, $p=0.012$). Pada penelitian ini didapatkan bahwa sCD80 merupakan penanda terbaik untuk memprediksi penuaan sistem imun pada orang tua dengan AUC 0,71 [0,57-0,86], sensitivitas 53,1%, spesifisitas 80,0%, dan cut off 129ng/ml. Sebagian besar individu lanjut tua memiliki setidaknya satu komorbiditas, di mana sekitar 25,0% dan 3,1% dari subyek diklasifikasikan sebagai CCI ringan dan sedang. Analisis multivariat menunjukkan bahwa komorbiditas pada individu lanjut usia berhubungan dengan kadar sCTLA4 26,5ng/ml dan sCD80 129,0ng/ml. Selanjutnya, subjek dengan komorbiditas (CCI) dikaitkan dengan sCD80 129,0ng/ml (OR 12,44 [95% CI 1,32–117,03], $p=0,027$). Mempertimbangkan hasil ini, sCD28, sCTLA4, dan sCD80 masing-masing dapat dikembangkan sebagai biomarker untuk memprediksi penuaan sistem imun dan komorbiditas pada lansia.

Kata Kunci: Lanjut usia, molekul kostimulatori terlarut, penuaan imun, penyakit penyerta

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