INTISARI

Latar Belakang: Gagal jantung akut (GJA) adalah kelainan kardiovaskular karena remodeling jantung yang disertai dengan stres oksidatif dan inflamasi sistemik. NT-ProBNP merupakan biomarker utama dalam tatalaksana GJA, tetapi masih banyak kekurangan dari segi mekanisme biologis maupun teknis pemeriksaan. Oleh karena itu, diperlukan parameter lain yang terjangkau untuk membantu stratifikasi risiko dan manajemen pasien GJA. *Uric Acid to Albumin Ratio* (UAR) dan *Monocyte to Lymphocyte Ratio* (MLR) merupakan indikator inflamasi dan stres oksidatif yang berhubungan dengan penyakit kardiovaskular. Dua rasio ini relatif lebih mudah dan murah didapatkan, sehingga diperlukan bukti terhadap potensi kegunaannya sebagai biomarker tambahan selain NT-ProBNP pada stratifikasi GJA.
Tujuan: Mengevaluasi hubungan UAR dengan NT-Pro BNP serta MLR dengan NT-ProBNP.
Metode: Penelitian potong lintang dengan pendekatan retrospektif dilakuakn di RSUP Dr. Sardjito. Subjek penelitian adalah pasien yang datang ke IGD dengan diagnosis tegak GJA tanpa penyerta sindroma koroner akut, gagal ginjal kronik, atau pro-operasi katup jantung. Data karakteristik didapatkan dari rekam medik elektronik termasuk UAR, MLR, serta NT-ProBNP untuk dianalisis hubungannya. Batas kemaknaan dianggap signifikan jika $p<0,05$.
Hasil: Dari 235 subjek penelitian, didominasi laki-laki(65,1%), dengan usia median 59 tahun. UAR berkorelasi positif terhadap NT-ProBNP ($r=0,429$, $p<0,001$), sementara MLR tidak berkorelasi ($p=0,180$). Analisis regresi linear sederhana menunjukkan UAR dan eLFG dengan $R^2=0,179$ dan 0,194 ($p<0,001$ keduanya). Koefisien regresi UAR=1,365; LogIMT=-1,292; LogeLFG=-0,850, HFrEF=0,202, anemia=0,280. Uji regresi linear berganda terhadap variabel tersebut didapatkan R^2 0,338 dan 0,302 (tanpa HFrEF), dan didapatkan persamaan estimasi NT-ProBNP (eNT-ProBNP): $eNT\text{-}ProBNP=316227,7 \times UAR^{0,98} \times eLFG^{-0,46} \times IMT^{-0,985} \times 10^{0,191 \times 1 \text{ (jika anemia)}} \times 10^{0,209 \times 1 \text{(jika HFrEF)}}$ atau $eNT\text{-}ProBNP=197242,2 \times UAR^{1,068} \times eLFG^{-0,467} \times IMT^{-0,772} \times 10^{0,169 \times 1 \text{ (jika anemia)}}$ [jika tidak dapat menentukan HFrEF].
Kesimpulan: UAR berkorelasi positif terhadap NT-ProBNP, sedangkan MLR tidak berkorelasi terhadap NT-ProBNP.

Kata Kunci: Gagal Jantung Akut, *Uric Acid to Albumin Ratio*, *Monocyte to Lymphocyte Ratio*, NT-ProBNP.

ABSTRACT

Background: Acute heart failure (AHF) is a cardiovascular disorder caused by cardiac remodeling accompanied by oxidative stress and systemic inflammation. NT-ProBNP is the primary biomarker in AHF management; however, it still has several limitations in terms of both biological mechanisms and technical examination. Therefore, additional affordable parameters are needed to aid in risk stratification and management of AHF patients. The Uric Acid to Albumin Ratio (UAR) and Monocyte to Lymphocyte Ratio (MLR) are inflammatory and oxidative stress indicators associated with cardiovascular disease. These two ratios are relatively easy and inexpensive to obtain, making it necessary to evaluate their potential as additional biomarkers alongside NT-ProBNP for AHF stratification.
Objective: To evaluate the relationship between UAR and NT-ProBNP and MLR and NT-ProBNP.
Method: This cross-sectional study with retrospective approach conducted at Dr. Sardjito General Hospital. Subjects were patients in emergency department with diagnosis of AHF, excluding those with acute coronary syndrome, chronic kidney disease, or preoperative valvular heart disease. Patient characteristics were obtained from electronic medical records, including UAR, MLR, and NT-ProBNP, which were then analyzed for their relationships. Statistically significance if $p<0.05$.
Result: From 235 subjects, males predominated (65,1%), with a median age of 59 years. UAR showed a positive correlation with NT-ProBNP ($r=0,429, p<0.001$), whereas MLR did not correlate($p=0,180$). Simple linear regression analysis showed that UAR and eGFR had R^2 values of 0,179 and 0,194 ($p<0.001$ for both). The regression coefficients were UAR=1,365, LogBMI=-1,292, LogeGFR=-0,850, HFrEF=0,202, and anemia=0,280. Multiple linear regression analysis of these variables yielded R^2 values of 0,338 and 0,302 (without HFrEF), resulting in the NT-ProBNP estimation equation (eNT-ProBNP): $eNT\text{-}ProBNP=316227,7 \times UAR^{0,98} \times eLFG^{-0,46} \times IMT^{-0,985} \times 10^{0,191 \times 1(\text{if anemia})} \times 10^{0,209 \times 1(\text{if HFrEF})}$ or $eNT\text{-}ProBNP=197242,2 \times UAR^{1,068} \times eLFG^{-0,467} \times IMT^{-0,772} \times 10^{0,169 \times 1(\text{if anemia})}$ [HFrEF status is unknown].
Conclusion: UAR showed positive correlation with NT-ProBNP, whereas MLR did not correlate with NT-ProBNP.

Keywords: Acute Heart Failure, Uric Acid to Albumin Ratio, Monocyte to Lymphocyte Ratio, NT-ProBNP.