

INTISARI

PERAN *NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN* (NGAL) URIN SEBAGAI PREDIKSI KEMATIAN SELAMA RAWAT INAP PASCA TINDAKAN INTERVENSI KORONER PERKUTAN PRIMER DI RSUP DR. SARDJITO

Dandy Firmansyah¹, Heru Prasanto², Iri Kuswadi²
PPDS Ilmu Penyakit Dalam¹, Subbagian Ginjal dan Hipertensi²
Fakultas Kedokteran, Kesehatan Masyarakat dan Keperawatan UGM/
RSUP Dr. Sardjito Yogyakarta

Latar Belakang: *Neutrophil gelatinase-associated lipocalin* (NGAL) merupakan salah satu protein di dalam kelompok besar *lipocalins*. NGAL berperan dalam inflamasi, apoptosis dan *remodeling* matriks ekstraselular kardiomyosit pada pasien dengan masalah jantung. Dalam konteks STEMI (*ST-Elevation Myocardial Infarction*), kadar NGAL urin dapat meningkat akibat inflamasi sistemik maupun kerusakan ginjal. Oleh karena itu, NGAL urin diharapkan dapat sebagai parameter laboratorium untuk memprediksi kematian selama rawat inap pasca tindakan intervensi koroner perkutan primer.

Tujuan Penelitian: Mengetahui peran NGAL urin sebagai prediksi kematian selama rawat inap pasca tindakan intervensi koroner perkutan primer di RSUP dr. Sardjito.

Metode Penelitian: Penelitian ini menggunakan metode potong lintang (*cross sectional study*), berlangsung pada bulan Juli sampai dengan November 2020 di Unit Gawat Darurat (UGD), Instalasi Laboratorium Terpadu (ILT) dan *Cardiovascular Care Unit* (CVCU) RSUP dr. Sardjito Yogyakarta. Subjek penelitian ini yaitu pasien STEMI yang menjalani intervensi koroner perkutan primer dan memenuhi kriteria inklusi maupun eksklusi. Dilakukan pengambilan data berupa kadar NGAL urin dua belas jam pasca tindakan intervensi koroner perkutan primer sebagai variabel bebas. *Follow up* dilakukan terhadap subyek penelitian untuk melihat ada tidaknya kematian selama rawat inap sebagai variabel terikat. Analisis multivariat digunakan untuk mengetahui hubungan variabel bebas dan terikat dengan mempertimbangkan adanya variabel pengganggu potensial.

Hasil Penelitian: Sejumlah 98 subyek penelitian dibagi menjadi 2 kelompok yaitu kelompok dengan NGAL urin < nilai *cutoff* dan NGAL urin \geq nilai *cutoff*. Berdasarkan *area under the receiver operating characteristic* (AUROC), nilai *cutoff* NGAL urin yaitu 39,25 ng/ml dengan sensitivitas 84,6% dan spesifisitas 56,5%. Selanjutnya dilakukan *follow up* untuk mengetahui ada tidaknya kematian selama rawat inap. Kematian terjadi pada 13 (13,3%) subyek, dimana 2 subyek memiliki NGAL urin < nilai *cutoff* dan 11 subyek memiliki NGAL urin \geq nilai *cutoff*. Analisis *mantel haenszel* menunjukkan variabel pengganggu potensial yang secara bermakna berpengaruh terhadap hubungan NGAL urin terhadap kematian yaitu usia, DM, hipertensi, dislipidemia, CHF, kreatinin, eGFR, merokok, BMI, status infeksi, anemia, derajat gagal jantung, jumlah koroner terlibat dan LVEF. Analisis multivariat menunjukkan bahwa NGAL urin $\geq 39,25$ ng/ml tidak bermakna secara independen sebagai prediksi kematian selama rawat inap pada pasien pasca tindakan intervensi koroner perkutan primer (p 0,075; OR 13,653; CI 0,772-241,535)

Kesimpulan: NGAL urin $\geq 39,25$ ng/ml tidak bermakna secara independen sebagai prediksi kematian selama rawat inap pada pasien pasca tindakan intervensi koroner perkutan primer.

Kata kunci: *Neutrophil gelatinase-associated lipocalin* (NGAL) urin, kematian, STEMI (*ST-Elevation Myocardial Infarction*), intervensi koroner perkutan primer

ABSTRACT

THE ROLE OF URINARY *NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN* (NGAL) AS A PREDICTOR OF HOSPITAL MORTALITY AFTER PRIMARY PERCUTANEOUS CORONARY INTERVENTION IN RSUP DR. SARDJITO

Dandy Firmansyah¹, Heru Prasanto², Iri Kuswadi²
Resident of Internal Medicine¹, Staff of Nephrology and Hypertension Division²
Faculty of Medicine, Public Health and Nursing UGM/
RSUP Dr. Sardjito Yogyakarta

Background: *Neutrophil gelatinase-associated lipocalin* (NGAL) is one of the proteins in the large group of *lipocalins*. NGAL plays a role in inflammation, apoptosis and remodeling of the extracellular matrix of cardiomyocytes in patients with heart disease. In the context of STEMI (ST-Elevation Myocardial Infarction), urinary NGAL levels may increase due to systemic inflammation or kidney damage. Therefore, urinary NGAL is expected to be a laboratory parameter to predict hospital mortality after primary percutaneous coronary intervention.

Objective: To determine the role of urinary NGAL as a predictor of hospital mortality after primary percutaneous coronary intervention in RSUP dr. Sardjito.

Methods: This research used cross sectional method, taking place from July to November 2020 in the Emergency Unit (ER), Integrated Laboratory Installation (ILT) and Cardiovascular Care Unit (CVCU) RSUP dr. Sardjito Yogyakarta. The subjects of this research were STEMI patients who underwent primary percutaneous coronary intervention and met the inclusion and exclusion criteria. Data in the form of urinary NGAL levels twelve hours after primary percutaneous coronary intervention was collected as an independent variable. Follow-up was carried out on research subjects to see whether there was hospital mortality as the dependent variable. Multivariate analysis was used to determine the relationship between independent and dependent variables by considering the existence of potential confounding variables.

Results: A total of 98 research subjects were divided into 2 groups (urinary NGAL < *cutoff* value and urinary NGAL \geq *cutoff* value). Based on the area under the receiver operating characteristic (AUROC), the *cutoff* value of urinary NGAL was 39.25 ng/ml with sensitivity of 84.6% and specificity of 56.5%. Furthermore, follow-up was carried out to determine whether there was hospital mortality. Mortality occurred in 13 (13.3%) subjects, of which 2 subjects had urinary NGAL < *cutoff* value and 11 subjects had urinary \geq *cutoff* value. *Mantel haenszel* analysis showed potential confounding variables that significantly influenced the relationship of urinary NGAL to mortality. The variables are age, diabetes mellitus, hypertension, dyslipidemia, CHF, creatinine, eGFR, smoking, BMI, infection status, anemia, degree of heart failure, number of coronary involvement and LVEF. Multivariate analysis showed that urinary NGAL \geq 39.25 ng/ml was not independently significant as a predictor of hospital mortality after primary percutaneous coronary intervention (p 0.075; OR 13.653; CI 0.772-241.535).

Conclusion: Urinary NGAL \geq 39.25 ng/ml was not independently significant as a predictor of hospital mortality after primary percutaneous coronary intervention.

Keywords: *Urinary neutrophil gelatinase-associated lipocalin (NGAL), mortality, STEMI (ST-Elevation Myocardial Infarction), primary percutaneous coronary intervention*