

ABSTRAK

Latar belakang : Hipertensi arteri pulmonal (HAP) merupakan komplikasi serius pada sekitar 10% pasien penyakit jantung bawaan (PJB) terutama defek septum atrium (DSA) yang tidak terkoreksi. Tekanan arteri pulmonal yang meningkat secara kronis menyebabkan disfungsi ventrikel kanan, penurunan kualitas hidup, serta peningkatan morbiditas dan mortalitas. Pada negara berkembang, keterlambatan diagnosis, keterbatasan terapi, dan pemantauan progresivitas penyakit berkontribusi terhadap luaran klinis yang buruk. Biomarker non-invasif seperti NT-proBNP memiliki potensi penting sebagai indikator prognosis. NT-proBNP mencerminkan beban ventrikel kanan dan derajat disfungsi jantung sehingga dapat membantu memantau progresivitas penyakit serta menilai kesintasan pasien.

Tujuan : Meneliti peran NT-proBNP untuk menilai kesintasan pasien HAP terkait DSA.

Metode : Penelitian ini merupakan studi potong lintang menggunakan data registri COHARD-PH RSUP Dr. Sardjito periode 2012–2023. Subjek penelitian adalah pasien HAP DSA usia ≥ 18 tahun yang telah menjalani kateterisasi jantung kanan dan memiliki data NT-proBNP awal. Pasien dengan kardiomiopati, riwayat infark miokard, penyakit paru kronis, atau disfungsi ginjal dikecualikan. Analisis multivariat menggunakan regresi logistik ganda untuk menilai prediktor independen kesintasan. Kurva ROC digunakan untuk menentukan nilai cut-off NT-proBNP terbaik kesintasan pasien. Nilai $p < 0,05$ dianggap signifikan secara statistik.

Hasil : Sebanyak 80 pasien HAP terkait DSA memenuhi kriteria penelitian terdiri dari 50 pasien hidup dan 30 pasien meninggal pada akhir follow up. Kadar NT-proBNP secara signifikan lebih tinggi pada kelompok meninggal dibanding kelompok hidup. Analisis bivariat menunjukkan NT-proBNP < 300 pg/mL dan NT-proBNP 300–1100 pg/mL meningkatkan kesintasan pasien dibanding NT-proBNP > 1100 pg/mL. Analisis multivariat menunjukkan NT-proBNP < 300 pg/mL (OR 19,39; CI 95% 1,56–240,33; $p = 0,021$) dan NT-proBNP 300–1100 pg/mL (OR 5,41; CI 95% 1,36–21,54; $p = 0,017$) merupakan prediktor independen kesintasan. Denyut jantung ≤ 96 kali/menit juga signifikan meningkatkan kesintasan pasien (OR 5,95; CI 95% 1,42–24,80; $p = 0,014$). Analisis ROC menghasilkan AUC 0,709 ($p < 0,001$) dengan cut-off optimal NT-proBNP 841 pg/mL. Pasien dengan NT-proBNP < 841 pg/mL signifikan memiliki peluang kesintasan dibanding NT-proBNP ≥ 841 pg/mL. Analisis multivariat juga menunjukkan NT-proBNP < 841 pg/mL sebagai prediktor independen kesintasan pasien HAP-DSA.

Kesimpulan : NT-proBNP yang lebih rendah menjadi prediktor independent kesintasan pasien HAP-DSA. Denyut jantung (≤ 96 kali/menit) juga signifikan sebagai prediktor independen dalam mempengaruhi kesintasan pasien HAP DSA.

Kata Kunci : NT-proBNP, Hipertensi Arteri Pulmonal (HAP), Defek Septum Atrium, Kesintasan.

ABSTRACT

Background: Pulmonary arterial hypertension (PAH) is a serious complication occurring in approximately 10% of patients with congenital heart disease (CHD), particularly in uncorrected atrial septal defect (ASD). Chronic elevation of pulmonary arterial pressure leads to right ventricular dysfunction, reduced quality of life, and increased morbidity and mortality. In developing countries, delayed diagnosis, limited access to therapy, and inadequate monitoring of disease progression contribute to poor clinical outcomes. Non-invasive biomarkers such as NT-proBNP have important potential as prognostic indicators. NT-proBNP reflects right ventricular load and the degree of cardiac dysfunction, making it useful for monitoring disease progression and predicting patient survival.

Objective: To investigate the role of NT-proBNP in assessing survival among patients with PAH associated with ASD.

Methods: This was a cross-sectional study using data from the COHARD-PH registry at Dr. Sardjito General Hospital from 2012–2023. Subjects were patients aged ≥ 18 years with PAH due to ASD who had undergone right heart catheterization and had baseline NT-proBNP data available. Patients with cardiomyopathy, history of myocardial infarction, chronic lung disease, or renal dysfunction were excluded. Multivariate analysis was performed using multiple logistic regression to identify independent predictors of survival. ROC curve analysis was used to determine the optimal NT-proBNP cut-off value for patient survival. A p-value < 0.05 was considered statistically significant

Results: A total of 80 patients with PAH associated with ASD met the inclusion criteria, consisting of 50 survivors and 30 non-survivors at the end of follow-up. NT-proBNP levels were significantly higher in the non-survivor group compared to the survivor group. Bivariate analysis showed that NT-proBNP < 300 pg/mL and NT-proBNP 300–1100 pg/mL increased survival compared with NT-proBNP > 1100 pg/mL. Multivariate analysis identified NT-proBNP < 300 pg/mL (OR 19.39; 95% CI 1.56–240.33; $p=0.021$) and NT-proBNP 300–1100 pg/mL (OR 5.41; 95% CI 1.36–21.54; $p=0.017$) as independent predictors of survival. Heart rate ≤ 96 bpm was also a significant predictor of survival (OR 5.95; 95% CI 1.42–24.80; $p=0.014$). ROC curve analysis yielded an AUC of 0.709 ($p<0.001$) with an optimal NT-proBNP cut-off value of 841 pg/mL. Patients with NT-proBNP < 841 pg/mL had a significantly higher survival rate compared to those with NT-proBNP ≥ 841 pg/mL. Multivariate analysis also identified NT-proBNP < 841 pg/mL as an independent predictor of survival in patients with PAH-ASD.

Conclusion: Lower NT-proBNP levels are independent predictors of survival in patients with PAH due to ASD. A heart rate ≤ 96 bpm at diagnosis was also found to be an independent predictor associated with improved survival.

Keywords: NT-proBNP, Pulmonary Arterial Hypertension (PAH), Atrial Septal Defect (ASD), Survival.