

## INTISARI

# **PENILAIAN *RIGHT VENTRICLE – PULMONARY ARTERY COUPLING* SEBAGAI FAKTOR PREDIKSI KEMATIAN PADA PASIEN DEFEK SEPTUM ATRIUM YANG BELUM DIKOREKSI DENGAN HIPERTENSI PULMONAL**

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**Latar Belakang:** Pasien defek septum atrium (DSA) dengan hipertensi pulmonal (HP) mengalami perubahan keseimbangan *Right Ventricle-Pulmonary Artery Coupling* (RVPAC) akibat peningkatan resistensi pulmonal dan penambahan beban pada RV. Pengukuran RVPAC telah digunakan untuk memprediksi luaran berbagai kondisi kardiopulmonal.

**Tujuan Penelitian:** Mengetahui peran pengukuran RVPAC dalam memprediksi kematian pasien defek septum atrium yang belum dikoreksi dengan hipertensi pulmonal.

**Metode Penelitian:** Penelitian ini merupakan studi observasional analitik dengan desain kohort retrospektif. Penelitian ini dilakukan pada pasien DSA dengan HP di RSUP Dr. Sardjito Yogyakarta yang terdaftar dalam registri *Congenital Heart Disease in Adult and Pulmonary Hypertension* (COHARD-PH) periode 2017-2021. Parameter RVPAC diwakili oleh nilai TAPSExPVAccT, TAPSE/TRV dan TAPSE/SPAP yang diukur dengan ekokardiografi.

**Hasil:** Terdapat 124 pasien yang memenuhi kriteria inklusi, 20 pasien diantaranya meninggal. Pasien yang meninggal memiliki rerata TAPSExPVAccT, TAPSE/TRV dan TAPSE/SPAP lebih rendah dibandingkan pasien yang hidup (secara berurutan 1759,8 vs 2295,5 mm.ms; 4,99 vs , 6,47x10<sup>-3</sup>mm.s; 0,30 vs 0,47 mm/mmHg). Nilai cut off TAPSExPVAccT, TAPSE/TRV dan TAPSE/SPAP adalah 2092,5 mm.ms, 4,3847x10<sup>-3</sup>mm.s dan 0,456 mm/mmHg. Berdasarkan analisis multivariat diketahui parameter TAPSExPVAccT (p=0,245; OR 1,97; IK95%: 0,62-6,22) dan TAPSE/TRV (p=0,998; OR 2,30; IK 95% 0,30-3,23) tidak bermakna secara statistik dalam memprediksi luaran kematian. Parameter TAPSE/SPAP (p=0,042; OR 8,44; IK 95%: 1,08-65,82) memiliki nilai penanda prognostik yang kuat luaran kematian

**Simpulan:** Parameter pengukuran RVPAC berupa rasio TAPSE/SPAP merupakan faktor prediktor independen kematian pada pasien defek septum atrium yang belum dikoreksi dengan hipertensi pulmonal. Pasien dengan rasio TAPSE/SPAP <0.456 mm/mmHg memiliki risiko kematian 8,44 kali lebih tinggi dibandingkan pasien dengan rasio TAPSE/SPAP >0.456 mm/mmHg.

Kata kunci: defek septum atrium, hipertensi pulmonal, *Right Ventricle-Pulmonary Artery Coupling*

## ABSTRACT

### ASSESSMENT OF RIGHT VENTRICLE – PULMONARY ARTERY COUPLING AS A PREDICTIVE FACTOR OF MORTALITY IN PATIENTS WITH UNCORRECTED ATRIAL SEPTAL DEFECT AND PULMONARY HYPERTENSION

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**Background:** Patients with atrial septal defect (ASD) and pulmonary hypertension (PH) experience changes in the Right Ventricle-Pulmonary Artery Coupling (RVPAC) balance due to increased pulmonary resistance and load increased on the RV. RVPAC measurement has been used to predict the outcome of various cardiopulmonary conditions.

**Objective:** To determine the role of RVPAC measurement in predicting mortality in patients with uncorrected atrial septal defect and pulmonary hypertension.

**Methods:** It was an analytical observational study with a retrospective cohort design. The study was conducted on ASD patients with PH at Dr. Sardjito Yogyakarta Hospital registered in the Congenital Heart Disease in Adult and Pulmonary Hypertension (COHARD-PH) registry from 2017 to 2021. RVPAC parameters were represented by TAPSExPVAccT, TAPSE/TRV, and TAPSE/SPAP measured by echocardiography.

**Results:** There were 124 patients who met the inclusion criteria, 20 of whom died. Patients who died had lower mean TAPSExPVAccT, TAPSE/TRV, and TAPSE/SPAP values compared to surviving patients (1759.8 vs. 2295.5 mm.ms; 4.99 vs. 6.47x10-3mm.s; 0.30 vs. 0.47 mm/mmHg, respectively). The cut-off values for TAPSExPVAccT, TAPSE/TRV, and TAPSE/SPAP were 2092.5 mm.ms, 4.3847x10-3mm.s, and 0.456 mm/mmHg, respectively. Based on multivariate analysis, it was found that the TAPSExPVAccT parameter ( $p=0.245$ ; OR 1.975; 95% CI: 0.62-6.22) and TAPSE/TRV ( $p=0.998$ ; OR 2,30; 95% CI: 0.30-3.23) were not statistically significant in predicting mortality outcome. The TAPSE/SPAP parameter ( $p=0.042$ ; OR 8.44; 95% CI: 1.08-65.82) had a strong prognostic value for mortality outcome.

**Conclusion:** The RVPAC parameter in the form of the TAPSE/SPAP ratio is an independent predictor of mortality in patients with uncorrected atrial septal defects with pulmonary hypertension. Patients with a TAPSE/SPAP ratio  $<0.456$  mm/mmHg have mortality risk 8.44 times higher than patients with a TAPSE/SPAP ratio  $>0.456$  mm/mmHg.

Keyword: atrial septal defect, pulmonary hypertension, Right Ventricle-Pulmonary Artery Coupling