INTISARI

HUBUNGAN *HEART RATE VARIABILITY* DENGAN KEJADIAN TAKIKARDIA VENTRIKULAR PADA PASIEN KOMPLEKS VENTRIKULAR PREMATUR IDIOPATIK *OUTFLOW TRACT*

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Latar Belakang: Takikardia ventrikular (TV) merupakan salah satu kejadian yang dapat terjadi pada penderita aritmia ventrikular (AV) idiopatik *outflow tract* (OT). Meskipun mekanisme TV pada populasi tersebut diinduksi oleh katekolamin, banyak kejadian TV terjadi ketika istirahat. Gangguan sistem otonom kardiovaskular merupakan salah satu teori yang mendasari kejadian TV. *Heart rate variability* (HRV) dapat menggambarkan aktivitas sistem otonom kardiovaskular secara mudah.

Tujuan: Mengetahui perbedaan nilai HRV pada populasi AV idiopatik OT yang mengalami kejadian TV dibandingkan tanpa kejadian TV.

Metode Penelitian: Observasi analisis ini dilakukan secara potong lintang menggunakan data sekunder registri aritmia di RSUP Dr. Sardjito sejak periode Januari 2017-Desember 2021, pada populasi kompleks ventrikular prematur (KVP) idiopatik OT. Dilakukan penelusuran terhadap karakteristik dasar, *magnetic resonance imaging* (MRI) jantung, ekokardiografi, serta tes *treadmill/multislice computerized tomography* (MSCT) *scan* koroner jantung. Data kejadian TV (kompleks KVP ≥3 kompleks berurutan) diperoleh dari catatan rekam medis maupun rekaman elektrokardiogram (EKG). Data HRV didapatkan dari hasil pemeriksaan Holter 24 jam domain waktu dan domain frekuensi, yaitu standar deviasi interval NN (SDNN), *standard deviation of the average NN* (SDANN), *the square root of the mean squared differences of successive* N-N *intervals* (RMSSD), *low frequency* (LF), *high frequency* (HF), serta rasio LF/HF.

Hasil: Dari total 58 subjek penelitian, didapatkan 25 subjek mengalami kejadian TV dan 33 subjek tanpa kejadian TV. Terdapat penurunan nilai SDNN (116±32 vs 143±40 mdet, p=0,010) dan nilai SDANN (103±27 vs 133±43 mdet, p=0,003) yang signifikan pada kelompok dengan kejadian TV dibandingkan dengan tanpa kejadian TV. Nilai RMSSD lebih rendah (38±36 vs 41±26 mdet, p=0,712) pada kelompok kejadian TV dibandingkan tanpa kejadian TV meskipun tidak signifikan. Parameter LF (0,25±0,13 vs 0,29±0,10 mdet, p=0,216), HF (0,22±0,13 vs 0,25±0,11 mdet, p=0,409), dan rasio LF/HF (1,21±0,31 vs 1,32±0,34 mdet, p=0,204) tidak berbeda bermakna. Analisis kurva ROC parameter SDNN terhadap kejadian TV didapatkan nilai AUC sebesar 71%, dengan titik potong 119 mdet. Kelompok SDNN rendah (<119 mdet) memiliki rasio prevalensi kejadian TV 2,5 kali (IK 95% 1,3-4,7) lebih besar dibandingkan kelompok SDNN normal (≥119 mdet).

Simpulan: Terdapat penurunan HRV pada penderita AV idiopatik OT yang mengalami kejadian TV dibandingkan tanpa kejadian TV, dengan peningkatan risiko kejadian TV 2,5 kali lipat pada penderita dengan SDNN <119 mdet.

Kata Kunci: aritmia ventrikular idiopatik *outflow tract*, *heart rate variability*, SDNN

ABSTRACT

ASSOCIATION OF HEART RATE VARIABILITY WITH VENTRICULAR TACHYCARDIA EPISODE IN PATIENTS WITH IDIOPATHIC PREMATURE VENTRICULAR COMPLEX FROM OUTFLOW TRACT

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Background: Episode of ventricular tachycardia (VT) may happen in patients with idiopathic premature ventricular complex (PVC) from outflow tract (OT). The mechanism of VT in this population is induced by catecholamine. However, some experience episodes of VT while resting. A disturbance in the cardiovascular autonomy system is one theory that underlies the VT episode. Heart rate variability (HRV) is an easy-to-use tool to assess cardiovascular autonomic activity.

Aim: This study aimed to assess the association between heart rate variability and VT episode in patients with idiopathic PVC from OT

Research Methods: Analytical observational study with a cross-sectional design were conducted using arrhythmia registry data. Patients diagnosed with idiopathic PVC from OT from January 2017-December 2021 were listed, and their examinations data including clinical characteristics, cardiac magnetic resonance imaging (MRI), echocardiography, treadmill test or coronary multislice computerized tomography (MSCT) scan were all reviewed. The VT episode was acquired from medical records or electrocardiography (ECG) recording. The result of HRV parameters were analyzed from 24 hour Holter examination. The parameters used are standard deviation of the NN interval (SDNN), standard deviation of the average NN (SDANN), the square root of the mean squared differences of successive N-N intervals (RMSSD), low frequency (LF), high frequency (HF), and LF/HF ratio.

Results: Fifty eight subjects were placed into groups according to their history of VT episode. The VT episode group consists of 25 subjects and the no VT episode group consists of 33 subjects. The SDNN (116 ± 32 vs. 143 ± 40 ms, $p=0.010$) and SDANN (103 ± 27 vs. 133 ± 43 ms, $p=0.003$) were significantly lower in subjects with VT episode compared to no VT episode. The RMSSD (38 ± 36 vs. 41 ± 26 ms, $p=0.712$) was also lower in patients with VT episode however the it was not significant. The frequency domain parameters including LF (0.25 ± 0.13 vs 0.29 ± 0.10 ms, $p=0.216$), HF (0.22 ± 0.13 vs 0.25 ± 0.11 ms, $p=0.409$), and LF/HF ratio (1.21 ± 0.31 vs 1.32 ± 0.34 ms, $p=0.204$) were not different statistically. A ROC curve analysis was done to measure SDNN as a predictor for VT episode with an AUC value of 71%. A cut-off point of 119 ms for SDNN was acquired. The subjects with low SDNN value (<119 ms) were more likely to have a VT episode 2.5 times (95%CI 1.3-4.7) than subjects with normal SDNN value ($\geq$119 ms).

Conclusion: There is a decrease in HRV value in patients with idiopathic PVC from OT who have a VT episode compared to no history of VT episode, with 2.5-fold increased risk of VT episode in patients with SDNN <119 ms.

Keywords: Idiopathic ventricular arrhythmia from outflow tract, heart rate variability, SDNN