

INTISARI

PENGARUH IMPLANTASI ALAT PACU JANTUNG PERMANEN TERHADAP PERUBAHAN *STRAIN RESERVOIR* ATRIUM KIRI PADA PASIEN DISFUNGSI NODUS SINOATRIAL / DISFUNGSI NODUS ATRIOVENTRIKULAR

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Latar Belakang: Alat pacu jantung permanen (APJP) meningkatkan luaran klinis dan kualitas hidup pasien yang mengalami bradikardia. Namun kontraksi yang tidak terjadi secara sinkron pada pasien dengan APJP dapat merubah struktur dan mekanoelektrik otot jantung. *Strain reservoir* atrium kiri (AKi) dapat mendeteksi lebih dini remodeling otot jantung. Pengaruh implantasi APJP terhadap perubahan *strain reservoir* AKi masih belum jelas dan banyak dilakukan pada populasi Indonesia.

Tujuan Penelitian: Mengetahui pengaruh implantasi APJP terhadap perubahan *strain reservoir* AKi pada pasien simptomatis disfungsi nodus sinus/disfungsi nodus atrioventrikular (DNS/DNAV).

Metode Penelitian: Penelitian ini merupakan studi observasional dengan desain *pretest-posttest* satu kelompok. Penelitian ini dilakukan dengan mengambil data registri ALEKA pada pasien yang dilakukan implantasi APJP di RSUP Dr. Sardjito Yogyakarta periode November 2022-Agustus 2023. *Strain reservoir* AKi dinilai dengan menggunakan *2D speckle tracking echocardiography* dan dilakukan sebelum implantasi APJP dan dievaluasi 3-12 bulan pasca implantasi APJP.

Hasil: Terdapat 61 subjek yang memenuhi kriteria inklusi dan eksklusi, dengan median usia 70 (35-88) tahun. Sebanyak 56% (n=34) subjek merupakan perempuan. Sebanyak 64% (n=34) subjek menggunakan tipe APJP kamar ganda, 36% (n=22) subjek menggunakan moda APJP DDDR, dan 54% (n=33) subjek memiliki beban pacu ventrikel tinggi. Berdasarkan analisis univariat terjadi peningkatan *strain reservoir* AKi dari sebelum dan setelah implantasi APJP dengan median durasi evaluasi 8 (4-12) bulan ($19,15 \pm 7,98\%$ dan $22,57 \pm 8,78\%$, $p=0,008$, IK95% 0,939-5,897). Berdasarkan analisis multivariat, hipertensi dengan koefisien regresi -7,475 (IK95% -13,682 - -1,269, $p=0,019$) memiliki pengaruh terhadap perubahan *strain reservoir* AKi. Usia, jenis kelamin, terapi *antiremodeling*, dan durasi ekokardiografi evaluasi tidak bermakna secara statistik ($p>0,05$). Sejumlah 63,9% (n=39) subjek mengalami perbaikan dan 36,1% (n=22) subjek tidak mengalami perbaikan *strain reservoir* AKi.

Simpulan: Didapatkan pengaruh implantasi APJP terhadap perubahan *strain reservoir* AKi pada pasien simptomatis DNS/DNAV.

Kata kunci: simptomatis DNS/DNAV, alat pacu jantung permanen, *strain reservoir* atrium kiri

ABSTRACT

EFFECT OF PERMANENT PACEMAKER IMPLANTATION ON LEFT ATRIAL RESERVOIR STRAIN CHANGES IN PATIENTS WITH SINORIATRIAL NODE DYSFUNCTION/ATRIOVENTRICULAR NODE DYSFUNCTION

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Background: Permanent pacemaker (PPM) improves the clinical outcomes and quality of life of patients with bradyarrhythmias. Dysynchrony of contractions in patients with PPM may alter the structure and mechanoelectricity of the myocardium. Left atrial strain reservoir can detect early myocardium remodeling. The effect of PPM implantation on changes in left atrial strain reservoir is still unclear and has not been conducted in the Indonesian population.

Objective: To determine the effect of PPM implantation on changes in left atrial strain reservoir in symptomatic sinus node dysfunction/atrioventricular node dysfunction (SND/AVND) patients.

Methods: This study is an observational study with a one-group pretest-posttest design. This study was conducted by taking ALEKA registry data on patients who underwent PPM implantation at Dr. Sardjito Hospital Yogyakarta in the period November 2022-August 2023. Left atrial strain reservoir was assessed from 2D speckle tracking echocardiography and performed before PPM implantation and evaluated 3-12 months after PPM implantation.

Results: There were 61 patients who met the inclusion and exclusion criteria, with a median age of 70 (35-88) years and 56% (n=34) of the subjects were female. A total of 64% (n=34) with double chamber PPM type, 36% (n=22) with DDDR PPM mode, and 54% (n=33) had high ventricular pacing burden. Based on univariate analysis, there was an increase in left atrium strain reservoir from pre and post PPM implantation with a median evaluation duration of 8 (4-12) months ($19.15 \pm 7.98\%$ and $22.57 \pm 8.78\%$, $p=0.008$, IK95% 0.939-5.897). Based on multivariate analysis, hypertension regression coefficient -7.475 (IK95% -13.682 - -1.269, $p=0.019$) had an influence on the change of left atrium strain reservoir. Age, gender, antiremodeling therapy, and duration of echocardiographic evaluation were not statistically significant ($p>0.05$). A total of 63.9% (n=39) subjects experienced improvement and 36.1% (n=22) subjects did not experience improvement in left atrial strain reservoir.

Conclusion: There is an effect of PPM implantation on the change of left atrium strain reservoir in symptomatic SND/AVND patients.

Keywords: symptomatic SND/AVND, permanent pacemaker, left atrial strain reservoir