

Perubahan Fungsi Mekanik Jantung melalui 2D-Speckle Tracking Echocardiography pada Pasien dengan Angina Refrakter yang Menjalani Terapi External Counterpulsation = 2D Speckle Tracking Echocardiography after External Counterpulsation in Refractory Angina Patients

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Abstrak

ABSTRAK

Latar belakang: External Counter Pulsation (ECP) dapat diaplikasikan sebagai pilihan terapi pada pasien dengan angina refrakter yang tidak adekuat dikendalikan dengan terapi medis, angioplasti perkutan (IPK) ataupun bedah pintas arteri koroner (BPAK). Hasil bervariasi masih diperoleh pada perbaikan fraksi ejeksi ventrikel kiri pada pasien yang menjalani ECP. Metode 2D-Speckle Tracking Echocardiography (2D-STE) dianggap lebih unggul menilai perbaikan klinis, namun hingga kini belum ada penelitian yang mengevaluasi mekanikal ventrikel kiri dengan menggunakan 2D-STE pada pasien yang menjalani protokol standar ECP (35 sesi).

Tujuan: Mengetahui perubahan mekanik ventrikel kiri sesudah dilakukan 35 protokol standar ECP dibandingkan dengan kontrol/sham pada pasien angina refrakter yang tidak ideal menjalani revaskularisasi konvensional (IPK/BPAK).

Metode: Pasien dengan angina refrakter yang tidak dapat dilakukan revaskularisasi lebih lanjut secara konvensional (IPK/BPAK) dirandomisasi menjadi 2 kelompok: kelompok terapi standar ECP (300 mmHg) dan kelompok placebo/sham (75 mmHg). Terapi standar ECP diberikan selama 35 sesi, durasi 1 jam/hari/sesi, selama 5 hari/minggu, selama 7 minggu. Data 2D-STE mencakup strain longitudinal dan post systolic index (PSI) diambil sebelum dan sesudah terapi (dengan double-blind).

Hasil: Terdapat 46 subjek ikut serta dalam penelitian dan tidak ada subjek yang mengalami drop-out. Tiga pasien dieksklusi karena kualitas ekokardiografi sub-optimal. Dua puluh dua subjek disertakan dalam Grup Terapi ECP dan 21 subjek dalam Grup Kontrol (sham). Karakteristik dasar strain homogen sebelum dilakukan perlakuan baik secara global (Grup Terapi $12,42 \pm 4,55$ vs Grup Sham $12,00 \pm 4,92$; $p 0,774$) maupun secara segmental/regional (Grup Terapi $12,63 (0,01-25,16)$ vs Grup Sham $12,43 (0,01-27,20)$; $p 0,570$). Setelah perlakuan tidak didapatkan perbedaan bermakna secara statistik antar kelompok pada parameter mekanik ventrikel kiri baik secara global ($p 0,535$) maupun regional ($p 0,434$). Parameter PSI mengalami perbaikan pada grup Terapi ($p 0,049$) dan segmen dengan PSI $\geq 20\%$ cenderung mengalami perbaikan strain longitudinal pada grup Terapi dibanding grup Sham ($p 0,042$).

Kesimpulan: Terapi ECP sebanyak 35 sesi tidak memberikan perbaikan mekanik ventrikel kiri secara global maupun regional/segmental pada pasien angina refrakter yang tidak ideal menjalani revaskularisasi konvensional (IPK/BPAK) dibanding sham.

ABSTRACT

Background: External Counterpulsation (ECP) can be applied as a therapeutic option in patients with debilitating refractory angina inadequately controlled by medical therapy, percutaneous angioplasty (PCI), or coronary artery bypass surgery (CABG). Varied results are still obtained in the improvement of the left ventricular ejection fraction in patients undergoing ECP. The 2D-Speckle Tracking Echocardiography (2D-STE) method is considered superior in assessing clinical improvement, but there has been no study evaluating mechanical parameters of the left ventricle using 2D-STE in patients undergoing the standard ECP protocol (35 sessions).

Objective: To determine the effect of ECP on left ventricular mechanical parameters changes after performing 35 ECP standard protocols compared with sham (control) in patients with refractory angina who are not ideal for conventional revascularization (PCI/CABG).

Methods: We conducted a double-blind randomized control trial. Patients with refractory angina who could not be further revascularized conventionally (PCI/CABG) were randomized into 2 groups: the ECP group (300 mmHg) and the Sham group (75 mmHg). ECP standard therapy was given for 35 sessions, duration of 1 hour/day/session, for 5 days/week, for 7 weeks. 2D-STE data including strain and post systolic index (PSI) were obtained before and after therapy.

Results: There were 46 subjects included in the study without any drop-out. Three patients were excluded due to suboptimal echocardiographic images. Twenty-two subjects were included in the ECP group and 21 subjects into the sham group. A homogenous baseline strain was found either globally (ECP group 12.42 ± 4.55 vs Sham group 12.00 ± 4.92 ; $P=0.774$) or segmentally/regionally (ECP group 12.63 (0.01-25.16) vs the Sham group 12.43 (0.01-27.20); $P=0.570$). After treatment, there was no statistically significant improvement between groups in the mechanical function of the left ventricle both globally ($P=0.535$) or regionally/segmentally ($P=0.434$). There were improvements in the PSI parameters found in the ECP group ($P=0.049$) and segments with $PSI \geq 20\%$ tended to improve longitudinal strains in the Therapy group compared to the Sham group ($p 0.042$).

Conclusion: 35 sessions of ECP therapy did not improve the global nor regional/segmental left ventricular mechanical parameters in patients with refractory angina who were not ideally suited for conventional revascularization (PCI/CABG) compared to Sham.