Enhanced External Counterpulsation Improves Outcomes in Patients with Long COVID

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INTRODUCTION

- Globally, 30-50% of patients with COVID-19 have lingering symptoms approximately 6 months after the acute phase of SARS-CoV-2 infection.
- Enhanced External Counterpulsation (EECP) is a non-invasive technology that is known to improve cardiac and cerebral perfusion.
- We evaluated the use of EECP as a novel therapy for Long COVID symptoms.

METHOD

STUDY DESIGN
- A retrospective EHR evaluation of patients referred to Flow Therapy centers between April and October 2021 for EECP therapy.
- Patients had Long COVID symptoms with or without coronary artery disease (CAD).
- Patients with a minimum of 15 hours of EECP therapy (1-hour/day) were included.

ENDPOINTS
- Seattle Angina Questionnaire-7 (SAQ7) summary score
- Duke Activity Status Index (DASI)
- PROMIS Fatigue Instrument (PROMIS)
- Rose Dyspnea Scale (RDS)
- 6-minute walk test (6MWT)

STATISTICAL ANALYSIS
- The paired student's t-test was utilized for all continuous variables with categorical data assessed using a Fisher's exact test.

RESULTS

- 50 patients (54 ± 15 years; 68% female) were included for analyses.
- 100% of patients had an acute COVID-19 infection.
- Time from acute COVID-19 infection to therapy start was approximately 11 months (328 ± 139 days).

Table 1: Comorbidities

Comorbidity	N (%)	Comorbidity	N (%)
Dyslipidemia	21/50 (42)	Depression	19/50 (38)
Hypertension	21/50 (42)	Asthma	14/50 (28)
Anxiety	20/50 (40)	Diabetes	8/50 (16)
CAD	20/50 (40)	COPD	3/50 (6)
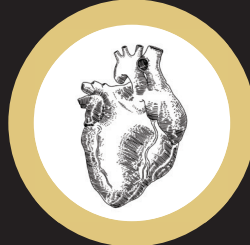
EECP significantly improved validated markers assessing Long COVID symptoms (SAQ7, DASI, PROMIS, RDS, and 6MWT)

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FLOW THERAPY

Poster data updated to include more patients (N=50) compared to original abstract submission (N=33)
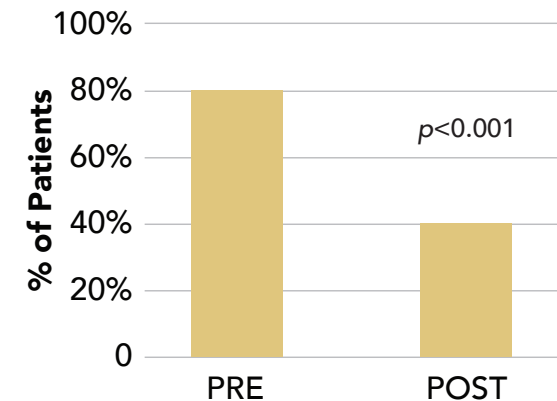
RESULTS

Table 2: Change from Baseline in Validated Markers (Mean ± SD)

Endpoint	Baseline	Change from Baseline	p-value
SAQ7 Summary	55.0 ± 24.4	25.4 ± 20.5	<0.001
DASI	11.4 ± 12.9	20.3 ± 15.6	<0.001
PROMIS	16.1 ± 3.8	-6.0 ± 3.8	<0.001
6MWT (feet)	1235.3 ± 446.4	178.4 ± 228.6	<0.001

Figure 1: Percent of Patients with a Severe (≥2) RDS Score Before and After EECP Therapy

Difficulty Breathing (RDS)

$p<0.001$

- Change from baseline for patients with Long COVID only (N=30) was significant for all endpoints; p<0.002
- No difference was evident between the patients with Long COVID without CAD compared to with CAD; p> 0.163 for all endpoints

CONCLUSION

- EECP improved validated markers assessing Long COVID symptoms in a clinically meaningful manner.
- Larger studies with a sham-control group are justified to further validate these findings.