

Assessing One-Year Outcomes of EECP Therapy on Exercise Capacity in Patients with Chronic Coronary Syndrome underwent coronary angiography

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ABSTRACT

Background: Enhanced External Counter pulsation (EECP) is an emerging non-invasive treatment that involves the rhythmic inflation of external cuffs positioned around the lower limbs, synchronized with the cardiac cycle. This therapy is mainly utilized for managing refractory angina—defined as persistent chest pain lasting at least three months—in patients who do not show improvement with guideline-directed medical treatments, surgical procedures, or percutaneous coronary interventions. There is limited data assessing the efficacy of EECP in individuals suffering from chronic coronary artery disease. This study aims to evaluate the impact of EECP on enhancing quality of life in patients with stable chronic coronary artery disease.

Methods: The current analysis experienced 106 individuals, who were either universal for drug therapy, inappropriate to surgical options, or passed through the Perxys Coronary Intervention (PCI) without reducing the symptoms. Participants were admitted to the Al-Nazaf Heart Center and several private clinics between January 2018 and December 2019. All subjects had to undergo coronary angiography; Those diagnosed with severe three-toot diseases (defined as more than 70% stenosis in each artery) were included in the study. Prior to initiating EECP treatment, the symptoms of the patient and echocardiographic parameters were evaluated and then observed over a period of 12 months.

Results: Data on 106 people (20 women and 86 men) were reviewed by 45 to 80 years (average age: 61) 8.2), over a period of 12 months follows. Most participants extracted on average 28 EECP sessions (SD) 7), producing a total response rate of 88.7% depending on the symptom cuts characterized by the Canadian Cardiovascular Society (CCS). Patients who received PCI and those who only received medical therapy after angiography were not quite different in the EECP response rates ($p = 0.82$). Furthermore, there was no statistically significant correlation between the type of procedure performed and changes in echocardiographic parameters post-EECP treatment ($P = 0.30$). The findings indicated that male patients exhibited a more favorable response to EECP compared to female patients ($p=0.001$). Additionally, factors such as smoking history, hypertension, and diabetes did not significantly affect responses to EECP treatment ($p = 0.54$, $p = 0.22$, and $p = 0.10$ respectively).

Conclusion EECP is an effective therapy for selected patients suffering from refractory angina that does not respond enough to traditional medical treatment or surgical procedures..

KEYWORDS: EECP, Angina, percutaneous coronary interventions, Angiography.

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INTRODUCTION

The refractory angina is painted as chronically stable ischemic heart disease that persists for three months or more and remains unbearable through medical therapy, surgical processes or percutaneous coronary intervention (PCI) (1). Enhanced External Counter Pulsation (EECP) is a non-invasive treatment modification contains applications of compressed cuffs at the lower ends (2). These cuffs are puffed from distilla to the nearest classes during the heart cycle, so they mimic the work on an intra- intra-aortic balloon pump. (3). This approach is shown to promote venous returns, improve coronary blood flow and reduce vascular resistance. As a result, the heart's workload is reduced while systemic circulation is increased (4). Endothelium-Derived Early Cell Response (EECR) therapy has been shown to improve collateral circulation, reduce vascular stiffness and improve endothelial function. Patients with heart failure have shown long -term benefits from the international EECP Pacific register, such as reduced angina symptoms, reduced dependency on nitroglycerin and improvement in the quality of life (5). It has been shown that this enrichment treatment is continuous for a period of up to three years after the end of treatment treatment (6). Although EECP is shown effectively in the treatment of stable angina, the use is limited by many contraindications, such as coagulation abnormalities ($INR > 2.5$), severe chronic obstructive pulmonary disease (COPD), cardiac arrhythmia and major peripheral vascular disease (7). In addition, studies suggest that EECP can reduce the cost of hospitalization, indicates its ability to extensive implementation in clinical practice (8).

The purpose of the study: The purpose of this study is to check the effectiveness of EECP in patients after PCI, which is contrary to those who receive drug therapy at a predetermined follow -up time.

METHODS

518 patients from the refractory angina who did not respond to the drug or who were not candidates for surgery were the subject of the first study. Coronary angiography was performed on all participants, and people with enough three-toxic disease were divided into two groups:

1. Patients considered unsuitable for surgery or intervention.

2. Patients in which remaining ischemia symptoms after PCI are, but are eligible for operation on one or two arteries. After a period of six weeks, patients who were continued to demonstrate symptoms were chosen to include them in the study, resulting in a total of 106 patients (60 from the medical group and 46 from the PCI group)..

The treatment was administered according to the standard protocol, and extensive basic data was collected. This data included age, gender, blood pressure reading, glucose level, pureel function measurements and complete blood count results. The inclusion criteria include anxious angina in the absence of existing therapy or interventions. Contrary to this, the exclusion criteria included severe peripheral vascular disease, the presence of aortic aneurysm, significant aortic valve impairment problems, uncontrolled high blood pressure levels and coagulopathy. Each session of EECP lasted one hour, and the majority of subjects completed a total of 30 sessions. Treatment responses were evaluated using Canadian Cardiovascular Society (CCS) grading both before and after EECP sessions, alongside echocardiographic assessments performed at six months and one-year post-treatment.

RESULTS

According to the gender distribution of those who participated in the research, males constituted the majority of participants (81%), while females constituted the remaining 19%. In light of this, it appears that the sample is considerably masculine-biased. See figure 1.

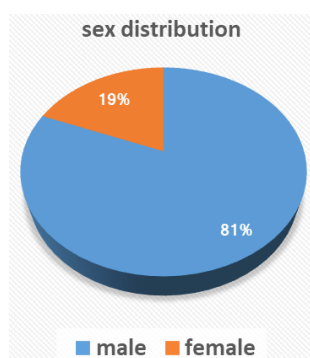


Figure 1: gender distribution of those who participated in the research

Table 1 showed that A chi-squared test showed that there was no significant association between the type of procedure and the EECP response. The chi-squared test yielded a p-value of 0.82, suggesting that the response rates were comparable in the PCI and angiography-only groups.

	EECP response		Total	P. value
	respond	not respond		
PCI	42	4	46	0.82
angiograph only	54	6	60	
Total	96	10	106	

Table -1: A chi-square test showed no statistically significant association between procedure type and EECP response, $\chi^2(1, N = 106) \approx 0.05$, $p = .82$. This means the response rate to EECP was the same in both PCI and angiography-only groups; the type of procedure was not significantly related to EECP response.

The presence of a special echocardiographic parameter was showed in table 2 that found to be associated with the type of process performed (PCI) vs. angiography). This result is not statistically important, as P-Man (0.30) is much higher than the normal range 0.05. This shows that there is no evidence that indicates that individuals who received PCI and those who only passed angiography had separate echocardiographic parameters. In other words, characteristics appeared in both groups of comparative speeds. The presence or absence of echocardiographic parameters is independent of the process type (PCI vs. angiography).

	Echocardiography parameter response		Total	P. value
	Respond	Not respond		
PCI	32	14	46	0.30
angiograph only	36	24	60	
Total	68	38	106	

Table -2: A chi-square test of independence showed no statistically significant association between procedure type and the echocardiographic parameter, $\chi^2(1, N = 106) \approx 1.06$, $p = 0.30$. This indicates that the presence of the echocardiographic parameter was similar in PCI and angiography-only groups; the type of procedure was not significantly related to the parameter.

Table 3 showed that a chi-square test of independence revealed a significant correlation between sex and EECP response, with values of $\chi^2(1, N = 106) = 22.3$ and a p-value of less than 0.001. Male patients were found to be substantially more likely to respond than female patients.

		EECP response		Total	p. value
		respond	not respond		
sex	female	12	8	20	0.001
	male	82	4	86	
	Total	94	12	106	

Table -3: A chi-square test of independence showed a statistically significant association between sex and EECP response, $\chi^2(1, N = 106) \approx 22.3$, $p < .001$. This indicates that male patients were significantly more likely to respond to EECP compared with female patients.

The results of freedom of freedom discovered that there was no significant relationship between smoking conditions and EECP response. The Chi-Square test received a price of 0.37, with a p-value of 54. This indicates that the response rate of smokers and non-smokers was comparable.

		EECP response		Total	p. value
		respond	not respond		
Smoking	smoker	40	4	44	0.54
	non smoker	54	8	62	
	Total	94	12	106	

Table -4: A chi-square test of independence showed no statistically significant association between smoking status and EECP response, $\chi^2(1, N = 106) \approx 0.37$, $p = 0.54$. This indicates that EECP response rates were similar in smokers and non-smokers.

Depending on the results of the Chi-Square testing of freedom, it was decided that there was no statistically significant relationship between the condition of high blood pressure and the EECP response. The Chi-Square test received a price of 1.49, with p-value.22. This indicates that the EECP response rate was comparable to patients with high blood pressure and patients without hypertension.

		EECP response		Total	p. value
		Respond	not respond		
hypertension	hypertensive	62	10	72	0.22
	non hypertensive	32	2	34	
	Total	94	12	106	

Table -5: A chi-square test of independence showed no statistically significant association between hypertension status and EECP response, $\chi^2(1, N = 106) \approx 1.49$, $p = .22$. This indicates that EECP response rates were similar in hypertensive and non-hypertensive patients

		EECP response		Total	p. value
		respond	not respond		
diabetes mellitus	diabetic	62	5	67	0.1
	non diabetic	32	7	39	
	Total	94	12	106	

Table -6: A chi-square test of independence showed no statistically significant association between diabetes status and EECP response, $\chi^2(1, N = 106) \approx 2.68$, $p = .10$. This indicates that although diabetic patients had a numerically higher response rate than non-diabetic patients, the difference was not statistically significant.

DISCUSSION

Most researchers indicated to spread coronary arterial disease as valid through angiography. Some of the participants received PCI, while others were disqualified for treatment (9). In light of the persistent symptoms exhibited, referral for EECP therapy was initiated, culminating in substantial symptomatic alleviation, particularly among those categorized as CCS3 and CCS4 (10, 11). Most patients improve the CCS1 or CCS2 classification after completing the EECP sessions, and in one year of follow -up, these improvements are continuous, which corresponds to the results of previous studies (12). The exact mechanism of reported reforms has not yet been detected. It is likely that reported benefits may not only occur from better myocardial spraying, but can also be attributed to secondary effects for those seen in physical rehabilitation (13). The long -term benefits of EECP have been shown to include endothelial function, angiogenesis, neuroro -hormonal control and exercise effects. The International EECP Pacific Register has seen the ongoing symptoms of treatment up to five years (14).

Current analysis indicated additional benefits of PCI for people with three-tooth disease in terms of EECP response or echocardiographic improvement. In addition, a remarkable clinical improvement and increase in quality of life was seen in both diabetes and non-melody individuals after EECP.

CONCLUSION

Conclusions suggest that EECP represents an effective therapeutic alternative for some individuals suffering from refractory angina that reflects inadequate reactions to traditional medical means or disqualified from other interventions.

EECP provides permanent symptomatic relief that lasts for at least one year after administration

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