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Original Research Article

COMPARATIVE ANALYSIS OF OUTCOME AFTER MEDICAL THERAPY ALONE VERSUS INCOMPLETE REVASCULARIZATION ALONG WITH MEDICAL THERAPY IN PATIENTS WITH MULTI-VESSEL CORONARY ARTERY DISEASE

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Abstract: *The retrospective study was conducted in the Department of Cardiology, Chaudhry Pervez Elahi Institute of Cardiology, Multan, from 29-Jan-2022 to 28-Jul-2022 to compare the frequency of relief from angina after medical therapy alone versus incomplete revascularization along with medical therapy in local patients with multi-vessel coronary artery disease. A total of 60 patients were enrolled and randomly divided into groups I and II. Group I received standard medical therapy as per the operational definition. Group II underwent incomplete coronary artery re-vascularization – stent placement through PCI in the fluoroscopy suite. Post-IR, these patients also received standard medical therapy. All the patients were called for monthly follow-up. Patients having symptomatic relief from angina were placed in functional class II. Results showed that pain relief from angina was observed in 10 (16.67%) patients and not in 50 (83.33%). A group comparison of symptomatic relief from angina showed that relief was observed in 02 (6.70%) patients in group I and 08 (26.70%) patients in group II. This result was statistically significant, with a p-value of 0.038. Stratification was performed based on age, gender, diabetes, hypertension, smoking, and obesity. There was no association between these variables and angina relief in either group. It can be concluded that in multi-vessel coronary artery disease, incomplete revascularization and medical therapy are superior to medical therapy alone.*

Keywords: Coronary Artery Disease, Percutaneous Coronary Intervention, Incomplete Revascularization, Medical Therapy

Introduction

Coronary artery disease (CAD) treatment depends upon clinical presentation, severity and extent of disease, and co-morbid conditions (Doenst et al., 2019). Unlike complete vascularization in coronary artery bypass graft surgery (CABG), the treatment of multi-vessel disease involves incomplete revascularization (IR) through percutaneous coronary intervention (PCI) (Hsieh et al., 2019). In IR, all diseased vessels are not treated due to various reasons such as the presence of chronic total occlusions, medical conditions like severe left ventricular dysfunction, or only treating "culprit lesion," which is considered to be the cause of symptoms (Hsieh et al., 2019; Leviner et al., 2018; Verevkin et al., 2019). Though there are various comparative studies on the outcomes of complete and incomplete revascularizations, only a few are conducted on recent data. A study compared initial management with PCI and optimum medical therapy (OMT) with deferred PCI with OMT. 5 year outcome suggested no difference in hospitalization, stroke, MI, or mortality rate between both the groups (Shah et al., 2021). Another comparative trial was conducted between patients given OMT alone (group I) and patients who underwent IR and OMT (group II). The 1-year outcome suggested a slightly higher mortality rate in group II, a higher prevalence of ACS in group I, and higher improvement in angina in group II (Acerbo et al., 2023). In CAD patients, coronary revascularization through PCI and CABG are the options, or the clinician can decide to manage through medical therapy alone. In this study, we aim to compare the frequency of relief from angina after medical therapy alone versus incomplete revascularization along with medical therapy in local patients with multi vessel coronary artery disease. The results will provide an insight on the optimum treatment strategy for CAD patients.

Methodology

The retrospective study was conducted in the Department of Cardiology, Chaudhry Pervez Elahi Institute of Cardiology, Multan, from 29-Jan-2022 to 28-Jul-2022. The study included patients aged 35 to 70 years presenting with chest pain (VAS > 3), coronary angiography showing multi-vessel coronary artery disease, and patients falling in Canadian functional Class III and IV. Patients with left main coronary artery disease with ≥50% stenosis and a history of coronary artery re-vascularization were excluded. A total of 60 patients were enrolled after informed written consent. The ethical board of the hospital approved the study.

Baseline demographic data, including age (years), gender (male/female), obesity (yes/no), diabetes mellitus, hypertension, and smoking was noted. Patients were randomly divided into Group I and Group II. Group I received standard medical therapy as per operational definition. Group II underwent incomplete coronary artery re-vascularization – stent placement through PCI in the fluoroscopy suite. Post-IR, these patients also received standard medical therapy. All the patients were called for monthly follow-up. The number and frequency of doses consumed during one month were noted. All the patients were counseled for compliance. All the patients were inquired about angina symptoms during each visit and investigated if found positive. Any emergency visit for

angina symptoms during the follow-up period was evaluated per the operation definition. Patients having symptomatic relief from angina were placed in functional class II. All the obtained information was noted on Performa, designed for the study.

SPSS version 23.0 was used for data analysis. Quantitative data was presented as mean and standard deviation, while qualitative data was presented as frequency and percentages. The Chi-square test was used to compare the frequency of patients free from angina in both groups. Stratification for age groups, gender, diabetes, hypertension, smoking and obesity was done to see the effect on the frequency of patients free from angina. P-value ≤ 0.05 was taken as significant.

Results

The mean age of patients was 52.72±10.46 years. The mean BMI was 25.31±3.00 kg/m2. There were more males as compared to the females. There were 39 (65.00%) male and 21 (35.00%) female patients. There were 27 (45.00%) diabetic and 33 (55.00%) non-diabetic patients. Hypertension was found in 42 (70.00%) patients, not 18 (30.00%). Out of 60, 24 (40.00%) patients were smokers. There were 22 (36.67%) obese and 38 (63.33%) non-obese patients. On the frequency of angina class after three months of intervention, class I was found in 01 (1.67%) patients, class II in 09 (15.0%) patients, class III in 42 (70.0%) patients, and class IV in 08 (13.3%) patients (Table I).

Symptomatic relief from angina was observed in 10 (16.67%), and it was not found in 50 (83.33%) patients. In group comparison, symptomatic relief from angina showed relief was observed in 02 (6.70%) patients in group I and in 08 (26.70%) patients in group II. This result was statistically significant, with a p-value of 0.038 (Figure 1).

Age stratification was performed, and age and symptomatic relief from angina. We're not associated with age. In patients aged 35-50, symptomatic relief from angina was observed in 02 (15.40%) patients in group I and 05 (35.70%) patients in group II. This result was statistically insignificant, with a p-value of 0.228. In patients aged 51-70, symptomatic relief from angina was observed in no patient in group I and 03 (18.80%) patients in group II. This result was also statistically insignificant, with a p-value of 0.228 (Table 2).

Stratification was also performed based on gender, diabetes, hypertension, smoking, and obesity. There was no association between these variables and angina relief in either group.

Table I Stratification of various study variables

Variable	Relief from angina	Group I	Group II	P value
Male				
	Yes	0	06 (28.60%)	0.014
	No	18 (100%)	15 (71.40%)	
Female				
	Yes	02 (16.70%)	02 (22.20%)	0.748
	No	10 (83.30%)	07 (77.80%)	
Diabetic				
	Yes	02 (16.70%)	02 (22.20%)	0.021
	No	10 (83.30%)	07 (77.80%)	
Non-diabetic				
	Yes	02 (10.50%)	02 (14.30%)	0.744
	No	17 (89.50%)	12 (85.70%)	
Hypertensive				
	Yes	02 (8.30%)	03 (16.70%)	0.406
	No	22 (91.70%)	15 (83.30%)	
Non-hypertensive				
	Yes	0	05 (41.70%)	0.063
	No	06 (100%)	07 (58.30%)	
Smoker				
	Yes	01 (8.30%)	04 (33.30%)	0.132
	No	11 (91.70%)	08 (66.70%)	
Non-smoker				
	Yes	01 (5.60%)	04 (22.20%)	0.148
	No	17 (94.40%)	14 (77.80%)	
Obese				
	Yes	01 (9.10%)	02 (18.20%)	0.534
	No	10 (90.90%)	09 (81.80%)	
Non-obese				
	Yes	01 (5.30%)	06 (31.60%)	0.036
	No	18 (94.70%)	13 (68.40%)	

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Table 2: Outcome comparison between the groups:

	Symptomatic Relief from Angina	No Symptomatic Relief from Angina
Total Patients (N)	10	50
Group I	2 (6.70%)	48 (96.00%)
Group II	8 (26.70%)	2 (4.00%)
Age Group	Age 35-50 years	
- Group I	2 (15.40%)	10 (83.30%)
- Group II	5 (35.70%)	9 (64.30%)
Age Group	Age 51-70 years	
- Group I	0 (0%)	38 (100%)
- Group II	3 (18.80%)	13 (81.20%)

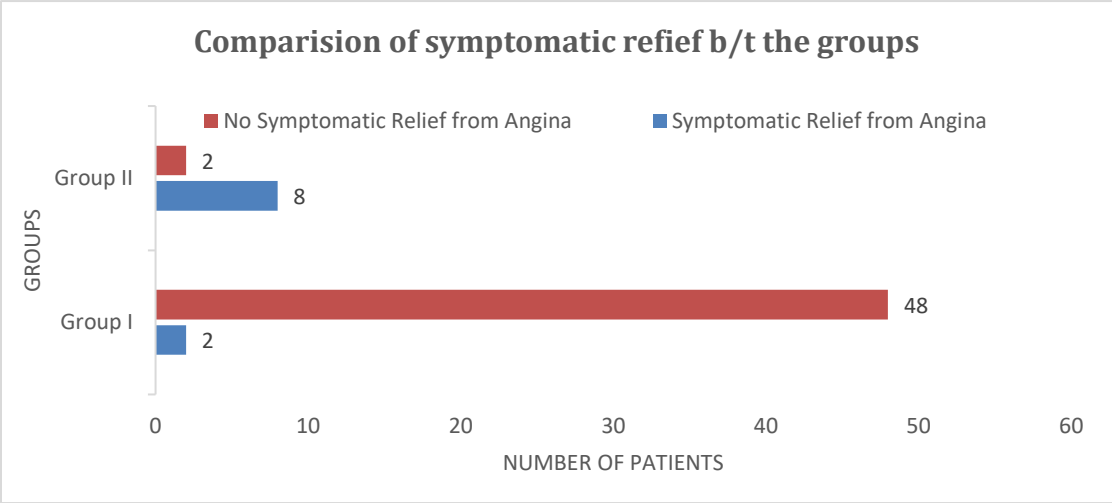

Fig.01 Comparison of symptomatic refief b/t the groups

Discussion

In this study, we compared the frequency of relief from angina after medical therapy alone versus incomplete revascularization and medical therapy in patients with multi-vessel coronary artery disease. This study observed symptomatic relief from angina in 6.70% of patients receiving IR and medical therapy compared to 26.70% of patients receiving medical therapy alone. An extensive multi-national study compared PCI combined with intensive OMT to a deferred PCI and OMT. 5 year follow-up showed no difference in mortality rate, stroke, MI, and need for hospitalization due to ACS between both groups (Akbari and Al-Lamee, 2022). Another study found that among PCI patients with acute MI, remote mortality (18.5% vs. 7.2%, p = 0.001) and major adverse cardiac event (53.1% vs. 24.3%, p = 0.001) rates were both higher for IR patients than for CR patients (Saito and Kobayashi, 2019). A study found that IR was associated with significantly higher 15-month mortality and MI (Su et al., 2019). A significant association was found between clinical prognosis and multi-vessel IR. CABG and PCI are significantly higher risk of 5-year MACCE if multi-vessel disease (MVD) is not revascularized (Kuronuma et al., 2022). A previous study showed that revascularization can improve survival by using a myocardial perfusion scan (Newby et al., 2021).

Similarly, a comparative study between OMT and PCI for stable patients revealed that both groups tended to have reduced risks of MI and death (Dahal and Budoff, 2021). Thus, the association between clinical outcomes and CR in previous studies may be indirectly associated with extensive reduction in ischemia and not with anatomic revascularization (Patel et al., 2019). A study reported that IR in non-diabetic patients with MVD who are candidates for both CABG and angioplasty does not impact long-term survival; however, there is an increased need for subsequent CABG and increased risk of MI (Beckman et al., 2021). A study on elderly patients who underwent IR and CR showed that both groups had similar major cardiac events. 1 year follow-up showed improvement in angina 65% patients CR and 68% patients in IR group. It was concluded that PCI coronary techniques are effective and safe in octogenarians (Guo et al., 2020). The results of current study are majorly different from previous studies, which can be explained by small and heterogeneous sample size and shorter follow up period. Larger studies are recommended to confirm the outcomes of our study.

Conclusion

In patients with multi-vessel coronary artery disease, incomplete revascularization combined with medical therapy is superior to medical therapy alone. In patients with multi-vessel coronary artery disease, incomplete

revascularization combined with medical therapy is superior to medical therapy alone.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department concerned.
Consent for publication
Approved
Funding
Not applicable

Conflict of interest

The authors declared absence of conflict of interest.

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