Original Article

# Improvement in LV Functions After 40 Days Following PCI of Asymptomatic Patients with Ischemia between 12 and 48 Hours



**Samra Rehmat, Sherbhader Khan and Imran Khan**


## ABSTRACT

**Objective:** To assess the impact of percutaneous coronary intervention (PCI) on left ventricular (LV) function in asymptomatic individuals with ischemia lasting between 12 and 48 hours.

**Study Design:** A cross-sectional study

**Place and Duration of Study:** This study was conducted at the Department of Cardiology MTI, LRH Peshawar between January 2021 and January 2023.

**Methods:** The study was done 100 patients enrolled at the Gujja Khan Medical College, Swabi, Department of Cardiology MTI,LRH Peshawar between January 2021 and January 2023 and included 100 individuals with ischemia lasting between 12 and 48 hours. They all had PCI at the time of the Study. Echocardiographic evaluations were done before PCI and 40–42 days after that. The primary outcome indicators were ejection fraction (EF) and fractional Shortening (FS) measurements of LV function. A statistical study was done to determine how PCI will affect LV functions.

**Results:** The findings revealed that after 40 days, the mean EF increased from 50.72 at baseline to 56.58, and the mean FS increased from 32.57 to 37.98, indicating a substantial improvement in LV functioning (p 0.001).

**Conclusion:** This Study found that asymptomatic individuals with ischemia lasting between 12 and 48 hours may improve their LV functioning with PCI.


**Key Words:** Percutaneous Coronary Intervention (PCI), Left Ventricular (LV) Functions, Ejection Fraction (EF), Fractional Shortening (FS)

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## INTRODUCTION

This Study looked at asymptomatic individuals with ischemia lasting between 12 and 48 hours to see how percutaneous coronary intervention (PCI) affected their left ventricular (LV) function. They got PCI throughout the investigation. Echocardiographic evaluations were performed at the beginning and 40 to 42 days following PCI. The primary outcome indicators were ejection fraction (EF) and fractional Shortening (FS) measurements of LV function. According to the findings, LV functions significantly improved after 40 days, with the mean EF increasing from 50.72 at baseline to 56.58 and the mean FS increasing from 32.57 to 37.98.

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In asymptomatic patients with ischemia lasting between 12 and 48 hours, PCI is beneficial in enhancing LV functioning.

According to the World Health Organisation (WHO), coronary artery disease (CAD) is one of the leading causes of mortality and disability worldwide, killing around 18 million people annually. Ischemic heart disease and heart failure are mainly brought on by it[1]. Reducing the risk of myocardial infarction (MI) and mortality is the primary goal of CAD therapy (Hoe, 2018)[2]. Percutaneous coronary intervention (PCI), which entails implanting a steel mesh (stent) to unblock the clogged artery and increase blood flow, is the most widely used treatment option for CAD (Soares et al., 2020)[3]. According to Husain et al. (2018)[4], PCI is an efficient way to improve symptoms, increase blood flow, and decrease mortality due to CAD. According to a recent study, PCI may also assist asymptomatic CAD patients by enhancing left ventricular (LV) function (Yang et al., 2018)[5]. In patients with CAD, LV function is a crucial indicator of the long-term prognosis (Nichols, 2009)[6]. According to Tong et al. (2017), the primary imaging method utilized to evaluate LV function in CAD is echocardiography[7]. This Study assessed how PCI affected LV function in

asymptomatic individuals with 12 to 48 hours of ischemia. Between January 2021 and January 2023, 100 patients were enrolled at the Gujja Khan Medical College, Swabi, Department of Cardiology MTI,LRH Peshawar6. Echocardiographic evaluations were performed at the beginning and 40 to 42 days following PCI. Ejection fraction (EF) and fractional shortening (FS) measurements of LV functions were the primary outcome indicators. A statistical study was done to determine how PCI will affect LV functions. After 40 days, the findings revealed that the mean EF increased from 50.72 at baseline to 56.58, and the mean FS increased from 32.57 to 37.98, showing a substantial improvement in LV functioning (p 0.001). These results imply that in asymptomatic patients with ischemia lasting between 12 and 48 hours, PCI is beneficial in enhancing LV functioning8. Furthermore, these findings are consistent with earlier studies that showed PCI positively benefits LV function in CAD patients (Yang et al., 2018)[5]. For asymptomatic patients with ischemia lasting between 12 and 48 hours, this Study suggests that PCI should be the primary line of therapy.

# METHODS

The Department of Cardiology MTI,LRH Peshawar at the Gujja Khan Medical College in Swabi undertook this prospective observational Study from January 2021 to January 2022.

**Study Population:** The 100 patients referred for PCI throughout the Study period made up the All of the patients who had ischemia between 12 and 48 hours and were asymptomatic. Exclusion criteria included stress echocardiography findings of inducible ischemia, abnormal LV ejection fraction (50%), and any clinical disorders that would have impacted the Study's outcomes.

**Data Collection:** Age, gender, hypertension, diabetes, past MI or revascularization, and smoking status were among the demographic and clinical variables that were gathered at baseline. To evaluate LV function, echocardiography was also done.

**Echocardiographic Assessments:** Echocardiographic evaluations were performed at the beginning and 40 to 42 days following PCI. Measurements were made of the LV ejection fraction (EF) and fractional Shortening (FS).

**Statistical Analysis:** IBM Inc., Armonk, New York, USA, SPSS version 21.0 was used to analyze the data. The mean values of EF and FS were compared between baseline and 40–42 days later using the Student's t-test. Statistical significance was defined as a p-value of 0.05.

# RESULTS

The Study included 100 asymptomatic individuals with ischemia lasting between 12 and 48 hours. Table 1 displays the demographic and clinical characteristics of the Study population. The patients' average age ranged from 46 to 68 years, and 88% were men. Diabetes and hypertension were found in 28% and 58% of the patients. At baseline, echocardiographic evaluations revealed that the mean EF was 50.72%, and the mean FS was 32.57%. Indicating a considerable improvement in LV functioning, after 40–42 days, the mean EF increased to 56.58% (p 0.001), and the mean FS increased to 37.98% (p 0.001) (Table 2).

**Table No.1: Demographic and Clinical Characteristics of the Study Population (n=100)**

| Demographic/Clinical Characteristic | Number (%) | % |
|---|---|---|
| Age | Mean (years) | 56 |
| Range (years) | 46–68 | |
| Gender | Male | 88 (88%) |
| Female | 12 (12%) | |
| Hypertension | Yes | 58 (58%) |
| No | 42 (42%) | |
| Diabetes | Yes | 28 (28%) |
| No | 72 (72%) | |
| Prior MI/Revascularization | Yes | 26 (26%) |
| No | 74 (74%) | |
| Smoking | Yes | 25 (25%) |
| No | 75 (75%) | |

**Table No.2: Echocardiographic Assessment Results before and after 40–42 days (n=100)**

| Echocardiographic assessment | Baseline | After 40–42 days |
|---|---|---|
| Ejection fraction (%) | 50.72 | 56.58 |
| Fractional Shortening (%) | 32.57 | 37.98 |

**Table No.3: Comparison of Ejection Fraction and Fractional Shortening before and after 40–42 days**

| Echocardiographic assessment | Baseline | After 40–42 days | p-value |
|---|---|---|---|
| Ejection fraction (%) | 50.72 | 56.58 | <0.001 |
| Fractional Shortening (%) | 32.57 | 37.98 | <0.001 |

# DISCUSSION

The Study's findings add to the research showing that PCI improves CAD patients' LV functioning. According to earlier research (Pan et al., 2014; Yang et al., 2018)[5], PCI may enhance LV remodelling, restore LV function, and lower mortality risk in CAD patients. Furthermore, recent research has shown that PCI may benefit even asymptomatic patients with ischemia lasting up to 48 hours, leading to significant improvements in LV function and decreases in mortality. In this investigation, asymptomatic individuals with ischemia lasting between 12 and 48

hours showed substantial improvements in LV function after 40 days[8]. The mean EF increased from 50.72 to 56.58 compared to the baseline, while the mean FS increased from 32.57 to 37.98. Similar improvements in LV function have been shown in other studies after PCI, with mean EFs ranging from 50 to 56 per cent and mean FSs from 32 to 39 per cent (Yang et al., 2018)[5]. Thus, our results are consistent with the body of research and show that PCI successfully enhances LV functioning in CAD patients. The research has several restrictions that must be addressed[9,10,11]. First, owing to selection bias, there may have been variations in the baseline characteristics of the patients since the research was completed throughout the year[12]. Second, since the follow-up time frame was so brief (40–42 days), the improvement in LV function may have been understated. Thirdly, mortality in asymptomatic patients with ischemia lasting between 12 and 48 hours was not evaluated, nor were the long-term effects of PCI on LV function, risk of recurrent ischemia, or other outcomes[13]. More research is required to assess the long-term consequences of PCI on these individuals. Our research showed that PCI successfully enhances LV functioning in asymptomatic individuals with ischemia lasting between 12 and 48 hours[14]. According to the findings, LV functions significantly improved after 40 days, with the mean EF increasing from 50.72 at baseline to 56.58 and the mean FS increasing from 32.57 to 37.98. According to these results, PCI ought to be the first choice of therapy for asymptomatic individuals with ischemia lasting between 12 and 48 hours.

# CONCLUSION

This Study found that asymptomatic individuals with ischemia lasting between 12 and 48 hours may improve their LV functioning with PCI. In addition, the findings showed that the mean EF increased from 50.72 at baseline to 56.58, and the mean FS increased from 32.57 to 37.98 after 40 days. Considering PCI as the first line of therapy for asymptomatic individuals with ischemia lasting between 12 and 48 hours is suggested by these results.

**Author's Contribution:**

| | |
|---|---|
| Concept & Design of Study: | Samra Rehmat |
| Drafting: | Sherbhader Khan |
| Data Analysis: | Imran Khan |
| Revisiting Critically: | Samra Rehmat, Sherbhader Khan |
| Final Approval of version: | Samra Rehmat |

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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