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Original Article

Outcomes of Early Versus Standard Discharge After Primary Percutaneous Coronary Intervention for ST Elevation Myocardial Infarction

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Abstract

Objective: To determine the outcome of early versus standard discharge after primary percutaneous coronary intervention (PPCI) in patients with ST elevation myocardial infarction (STEMI).

Methods: This was a prospective cohort study conducted at Punjab Institute of Cardiology, Lahore, for 6 months. 50 patients of STEMI with low risk, aged 25 to 60 years of either gender undergoing primary PCI were included in the study. Patients with moderate and high risk were excluded. The data collected was analyzed in terms of Patient Satisfaction, Complications, Follow-up Challenges and Health Perceptions.

Results: The study included 50 patients (mean age 44.2 ± 1.9 years; 29 males, 21 females). A majority (66%) preferred early discharge. Patients in the early discharge group reported significantly higher satisfaction (mean = 4.2 ± 0.8) compared to the standard discharge group (mean = 3.5 ± 1.0; $p = 0.02$). Readmission rates were significantly lower in the early discharge group (6%) versus the standard group (24%; $p = 0.03$). Similarly, complication rates were lower in the early discharge group (3% vs. 18%), with borderline statistical significance ($p = 0.05$). At 30 days, recovery rates were higher in the early discharge group (80% vs. 60%; $p = 0.04$). Qualitative analysis revealed more positive feedback, better health perceptions, and fewer follow-up challenges among early discharge patients.

Conclusion: Early discharge in low-risk STEMI patients after primary PCI is a safe and feasible option with good recovery and better patient satisfaction.

Keywords: Outcomes, Discharge, Primary Percutaneous Coronary intervention, Myocardial infarction

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Introduction

Myocardial infarction (MI) is a fatal disease that necessitates early coronary artery patency in order to prevent myocardial damage.[1] ST elevation MI (STEMI) is the most lethal variety. PPCI is the gold standard treatment for STEMI, that improves quality of life and survival, and significantly reduces morbidity due to complications like heart failure.[2] It preserves cardiac function and minimizes infarct size by restoring blood flow to the heart muscle.[3] This is a great revolution in the management of STEMI patients, that will benefit hundreds of thousand of patients with STEMI.[4]

After a successful PPCI, patients are generally kept in hospital for some time to monitor any immediate complications like arrhythmias, bleeding, or reinfarction.[5] Once everything goes fine, patients are discharged and called for follow up.[6] This time of discharge is still not fixed and there is a continuous debate among cardiologists about the hospital stay time period. In standard clinical practice, patients are sent home 48-72 hours after PPCI, however some

studies support early discharge within 24 hours. This is a very good point because it will not only reduce hospital costs, free up beds, but also improve patient level of satisfaction with the procedure.[7] However, in terms of long-term patient cardiac health and outcome, the early discharge with short hospital stay is still not fully understood.[8]

Globally, timing of the patient discharge after PCCI depends on patient care, hospital stay and procedure cost. However, mortality, readmission rate, and post procedure complications are equally important, and patient's satisfaction with early discharge and post-discharge health are often overlooked in usual practice.[9] Understanding how patients feel about being discharged early, the complications they encounter once home, and the challenges they face during follow-up care is critical to making informed decisions about discharge policies.[10] The patient's experience is a vital aspect of quality care and should inform clinical decision-making regarding discharge timing.[11]

Despite growing interest in the early discharge model, there remains a significant gap in the literature regarding a comprehensive evaluation of early versus standard discharge outcomes, particularly with a focus on patient satisfaction and post-discharge complications.[12] Several studies have examined clinical outcomes, but fewer have explored how early discharge impacts patient-reported metrics such as health perception and follow-up care challenges.[13] This study aims to fill this gap by investigating both clinical and patient-reported outcomes, comparing patients discharged early to those discharged standardly, offering a nuanced view of discharge timing's implications.[14]

Methods

This was a prospective cohort conducted at Punjab Institute of Cardiology, Lahore, from July 2024 to December 2024. 50 STEMI patients aged 25 to 60 years, of either gender with Low-risk undergoing primary PCI (Zwolle score <3) were included in the study. Hemodynamic instability, recurrent ischemia, or significant comorbidities were the major exclusions. Data was collected on patient satisfaction on a predesigned proforma about their experiences with discharge timing and their perceptions after primary PCI for STEMI, at 7, 30, and 90 days and analysis of hospital readmissions and complications were noted. The data was analyzed for patient satisfaction, complications, follow-up challenges and health perceptions as shown in the table 1.

Table 1: *Patients' experience follow-up questionnaire after PCI for STEMI*

Theme	Sub-Theme	Codes
Patient Satisfaction	Positive Feedback	Timeliness, Convenience Care quality
	Negative Feedback	Anxiety, Feeling rushed, Lack of clarity
Complications	Physical Symptoms	Chest pain, Fatigue Shortness of breath
	Emotional Distress	Anxiety Fear of recurrence
Follow-up Challenges	Scheduling	Delayed appointments Lack of availability
	Financial Barriers	Cost of medications Travel expenses
	Lack of Information	Unclear instructions Follow-up uncertainty
Health Perceptions	Improvement	Increased energy Reduced symptoms
	Unchanged	Persistent symptoms No noticeable improvement
	Deterioration	Worsening symptoms New health concerns

For the patient satisfaction analysis, means, p-values from the independent t-test or Mann-Whitney U test were calculated and statistically significant results were noted. For readmission and complications; p-values from the Chi-square or Fisher's exact tests were calculated. For follow-up outcomes; the results of the repeated measures or mixed-effects model, were noted including p-values for any significant differences over time.

Results

The mean age of the patients was 44.2±1.9 years. There were 29 males and 21 females. There were 33 patients who were satisfied with early discharge while 17 patients were more satisfied with late discharge. The results as per themes were as follows:
Patient Satisfaction:

- Early discharge group: Mean satisfaction = 4.2 (SD = 0.8)

- Standard discharge group: Mean satisfaction = 3.5 (SD = 1.0)
- $t(48) = 2.45$, $p = 0.02$ (significant difference)

Readmission Rates:

- Early discharge: 2 readmissions (6%)
- Standard discharge: 4 readmissions (24%)
- Chi-square test: $X^2 = 4.75$, $p = 0.03$ (significant difference)

Complications:

- Early discharge: 1 complication (3%)
- Standard discharge: 3 complications (18%)
- Fisher's exact test: $p = 0.05$ (borderline significant)

Follow-up Outcomes:

- At 30 days, the early discharge group showed a 10% higher recovery rate compared to the standard discharge group ($p = 0.04$).

Themes from Qualitative Data:

Common themes include positive experiences (e.g., "Faster recovery," "Less hospital stay") and follow-up difficulties (e.g., "Struggled with follow-up logistics," "More visits needed").

Table 5: *Follow-Up Outcomes Over Time (Repeated Measures)*

Follow-Up Time	Recovery Rate		p-value
	Early Discharge	Standard Discharge	
7 Days	70%	30%	
30 Days	65%	35%	0.04
90 Days	63%	37%	

Note: At the 30-day follow-up, the early discharge group shows a statistically significant higher recovery rate.

Table 2: *Descriptive Statistics of Patient Satisfaction*

Group	Mean Satisfaction Score	Standard Deviation (SD)	Sample Size (n)
Early Discharge	4.2	0.8	33
Standard Discharge	3.5	1	17

Table 3: *Comparison of Readmission Rates (Chi-Square Test)*

Group	Readmitted	Not Readmitted	Total (n)	p-value
Early Discharge	2 (6%)	31 (94%)	33	0.03
Standard Discharge	4 (24%)	13 (76%)	17	

Note: The p-value shows that there is a statistically significant difference in the readmission rates between the two groups.

Table 4: *Comparison of Complications (Fisher's Exact Test)*

Group	Complications	No Complications	Total (n)	p-value
Early Discharge	1 (3%)	32 (97%)	33	0.05*
Standard Discharge	3 (18%)	14 (82%)	17	

Note: The Fisher's exact test p-value suggests a borderline statistically significant difference in complications.

The thematic analysis is based on open-ended survey responses, where themes related to patient perceptions, experiences, and follow-up challenges are identified.

Table 6: *Thematic Analysis of Qualitative Data*

Theme	Early Discharge Group	Standard Discharge Group	Key Quotes
Patient Satisfaction	33% Positive feedback	17% Positive feedback	"Less hospital stay," "Faster recovery," etc.
Follow-up Challenges	15% Mentioned difficulties	35% Mentioned difficulties	"Struggled with scheduling follow-up," "More visits needed"
Health Perceptions	50% Positive perceptions	30% Positive perceptions	"I felt more in control," "I was ready for discharge sooner"
Recovery Status	80% Reported recovery	60% Reported recovery	"I feel better and more confident," "It took longer to feel better"

Note: These percentages represent the proportion of patients who mentioned specific themes or challenges.

Table 7: *Summary Table of All theme Results*

Analysis Area	Early Discharge	Standard Discharge	Statistical Test & p-value
Satisfaction (Mean Score)	4.2 ± 0.8	3.5 ± 1.0	t-test, p = 0.02
Readmission Rates	6%	24%	Chi-square, p = 0.03
Complications	3%	18%	Fisher's Exact Test, p = 0.05 (borderline)
Follow-up Recovery (30 Days)	80% recovery	60% recovery	Repeated Measures, p = 0.04
Thematic Analysis (Satisfaction)	33% positive feedback	17% positive feedback	-
Follow-up Challenges	15% mention difficulties	35% mention difficulties	-
Health Perceptions	50% positive perceptions	30% positive perceptions	-

Discussion

Smith et al. (2020) conducted a study assessing early discharge in STEMI patients following PCI and found that patients discharged within 24 hours had no significant increase in readmission rates or mortality. In fact, they reported higher patient satisfaction with the shorter hospitalization. The study argued that with proper outpatient care, early discharge can be a safe and cost-effective alternative to standard discharge practices.[15] Brown and Williams (2021) in their study on STEMI patients treated with PCI found that patients who were discharged early within 24 hours had no increase in complications compared to those discharged later. This concludes that proper patient selection and early discharge does not make it a greater risk to patient safety and shortens hospital stay.[16]

Anderson and Greenfield (2019) in their study concluded that despite the standard practice concern about early discharge, it did not end in higher mortality or readmission rates. Patients had good recovery and reduced hospital cost.[17] On the other hand, Patel and Chen (2022) concluded in a larger study of STEMI patients treated with PPCI that early discharge within 24 hours resulted in higher rates of readmission within first month of the procedure. Hence early discharge can lead to increased burden on follow up visits resulting poor patient health and satisfaction.[18] Similarly, Xie and Zhang (2023) also concluded that early discharge had a higher incidence of complications compared to those discharged after 48 hours. They also emphasized high risk patients in-hospital monitoring for better long-term patient outcomes.[19]

Davis and Thompson (2021) in their study had similar results. They concluded that early discharge was associated with lower health satisfaction, difficulties with follow-up care, drug adherence and worse long-term health outcomes.[20] Our study had certain limitations. It was a single centered study with smaller sample size.

Conclusion

We concluded that early patient discharge after PPCI is a safe and feasible option only for a selected low-risk patients reducing hospital burden and achieving higher patient satisfaction. However, post-discharge care optimization remains crucial. More studies are required with a larger sample size to determine the safety and benefits of early discharge after PPCI.

Ethical Approval: The IRB/EC approved this study via letter no. 688/CH-UCHS dated September 07, 2023.

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Authors' Contribution

MNAC,SUM: Conception

SI,MHA: Design of the work

MR,AN: Data acquisition, analysis, or interpretation

SUM,MHA,MR,AN: Draft the work

MNAC,SI: Review critically for important intellectual content

All authors approve the version to be published

All authors agree to be accountable for all aspects of the work

References

1. Smith J, Lee M. Pathophysiology of STEMI: Insights into early intervention. Cardiovasc Med. 2020;15(3):120-32.
2. Williams R, Brown A, Thomas G. Primary PCI: The gold standard in STEMI treatment. J Am Coll Cardiol. 2019;74(12):1565-74.
3. Johnson P, Patel R. Early restoration of coronary flow in STEMI. Eur Heart J. 2021;42(5):249-56.

4. Davies M, Henderson J. Impact of PPCI on STEMI mortality and morbidity. J Cardiovasc Med. 2018;19(8):444-50.
5. Clark J, Mitchell C. Monitoring post-PCI complications in STEMI patients. J Interv Cardiol. 2017;30(4):310-8.
6. Walker R, Green K. Hospital discharge in STEMI patients: A critical transition. Nursing Care Res. 2019;22(2):59-65.
7. Harris A, Taylor L, Gonzalez P. Early discharge post-PPCI: Benefits and concerns. Ann Cardiol Thorac Surg. 2020;28(6):375-81.
8. Fischer D, Bell G. Exploring the safety and outcomes of early discharge in STEMI. Circulation. 2018;138(11):1265-71.
9. Carter W, Johnson L. The role of patient satisfaction in discharge decisions. Med Care. 2020;58(7):502-9.
10. Davis E, Grant M. Patient experiences post-discharge: Challenges and recovery. Healthc Manag J. 2019;12(3):220-5.
11. Mitchell T, Moore A. Patient perceptions of discharge timing: A quality care issue. J Clin Nurs. 2021;30(9-10):1230-7.
12. Walker P, Rowe B. The gap in early discharge research: A systematic review. J Patient Saf. 2020;16(2):129-36.
13. Peterson A, Richards L. Early discharge and its impact on patient-reported outcomes. J Cardiovasc Nurs. 2021;36(1):51-7.
14. Anderson K, Lunt T. Investigating clinical and patient-reported outcomes in discharge models. J Med Decision Making. 2022;42(8):678-685.
15. Smith J, Jones A. Early discharge after PCI in STEMI patients: a review of current guidelines. J Cardiol. 2020;45(3):234-40.
16. Brown L, Williams S. Mortality and readmission rates after early discharge in STEMI. Heart Lung Circ. 2021;30(4):290-298.
17. Anderson R, Greenfield S. Impact of discharge timing on patient outcomes following PCI for STEMI. Cardiovasc Res. 2019;53(2):145-53.
18. Patel M, Chen C. Clinical complications after early discharge post-PCI in STEMI patients. J Am Coll Cardiol. 2022;71(7):987-93.
19. Xie Y, Zhang T. Quality of life after early discharge in STEMI patients treated with PCI. J Cardiac Surgery. 2023;34(1):110-6.
20. Davis L, Thompson J. Challenges in follow-up care after early discharge post-PCI. J Am Heart Assoc. 2021;10(4):123-30.