

MEASURING LENGTH OF HOSPITAL STAY IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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Abstract

To measure the length of stay for the patients who had Myocardial Infarction before and after introduction of full operation in Cardiac Catheterization suite and Comparing Percutaneous Coronary Intervention by determining its Safety compared with old conservative thrombolytic therapy. A retrospective cross-sectional study design conducted two months prior to cardiac catheterization suite in Cardiac center of King Saud Medical City (KSMC), Riyadh, KSA, using secondary medical records of 281 patients manually selected from the patients who had first attack of MI, been treated with PCI over a period from (August-September 2017 and February-March 2018). Likert scale Google questionnaire form application was used with independent variables where demographic data was illustrated using Pie charts, tabular charts, Statistics based on (durations, percentages, and frequencies). The data form was filled out electronically using portable computers. Demographics patient age 97% for males and 03% females admitted with MI was calculated with an average: 27.12, and mean of 53, BMI (17-42.6), presented with 100% Chest pain complain. Symptoms duration was 83% for 1-3 hours and 17% for less than hour. In Presenting illness majority had history of smoking about 48%. Length of stay time for Patients who were Admitted to PCI unit 45% (1-2 hours), 27 % (> 3hours), 14% (both 2-3hrs and < 1hr). While the average hospital LOS for non-PCI patients stood at 77 hours whereas, PCI was calculated to 63

hours. Length of hospital stay has been considered important measure of efficiency for patients with AMI has progressively decreased corresponding to 30% to 50% and education to the patients about the chest pain and its characteristics has to be introduced in public with Initiation of early transportation of patients with AMI to the cardiac center having catheterization suite is highly recommended, to avoid unwanted complications.

Keyword: Length of stay, acute myocardial infarction, Percutaneous Coronary Intervention, Coronary artery diseases

1.INTRODUCTION

Notwithstanding, the average length of stay (LOS) in patients with a first uncomplicated Acute Myocardial Infarction (AMI) is declining and early discharge from the hospital at day 2 or sooner of these low-risk patients does not appear to be associated with an increased risk of adverse events during post discharge and Patients with longer LOS have more comorbidities and in-hospital complications [1,2]. In addition, progressive and substantial decrease in hospital LOS after AMI was not associated with increased mortality after discharge [3]. Factors associated during length of stay in patients with non-ST-segment elevation myocardial infarction are needed to promote safe and early discharge in an era of increasingly restrictive health care resources [2]. In fact, decline in the LOS can be achieved through increasing use of effective therapies [3]. A Percutaneous Coronary Intervention (PCI) is known as effective therapy for the usefulness of primary PCI beyond highly selected

populations in randomized controlled trials that significantly decreases hospital LOS among vulnerable AMI patients [4]. LOS is commonly considered as a measure of efficiency and a resource consumption proxy, but much research is being done to predict patient risk and LOS at the time of admission, with favorable results. [5, 6]. However, early hospital discharge may negatively affect quality of care and lead to adverse outcomes with an evidence to previously studied observational and randomized clinical trials have shown that the early (≤ 72 hours) hospital discharge of patients with an uncomplicated, low-risk AMI is safe and cost-effective (7-8). Furthermore LOS in patients who are hospitalized for acute MI has decreased 30% overall with (period from 7.2 days in 1995 to 5.0 days in 2005) but the shorter hospital stays were not associated with higher rates of re-hospitalization or of post discharge mortality [9]. Interestingly, patients with cardiogenic shock caused by acute myocardial infarction as well as by unstable angina, they found the survival associated with percutaneous coronary intervention. [10] As expected in any intervention, Access-site bleeding and subsequent formation of a hematoma is the most common complication associated with PCI. It is often part related to anticoagulation and is more frequent when antiplatelet drugs are used. [11].

2.METHODS

2.1. Objectives

- 1) To measure the length of hospital stay in patients with acute myocardial Infarction
- 2) To compare acute Percutaneous Coronary Intervention (PCI) with old medical/conservative treatment in terms for LOS.
- 3) To determine the complications and Safety of the new modality of treatment (PCI) and its mortality.

2.2. Research design

A retrospective cross-sectional study design

2.3. Setting

This Study has been conducted two months prior and after full operation of cardiac catheterization suite in

Cardiac center of King Saud Medical City (KSMC) Riyadh, KSA, (Cardiac catheterization suite has been established at KSMC over the period Oct. 2017 until Dec. 2018). Firstly, our data was collected from medical records for previously mentioned period, including the patients who went through PCI therapy and who did not. Secondly, we have measured the length of hospital stay for both groups, in order to observe the difference between them.

2.4. Sampling Technique

Convenient and purposive sampling technique

2.5. Study duration:

6 Months

2.6. Participants:

The Secondary data from patients who had first time acute myocardial infarction over a period from August-September 2017 and February-March 2018.

2.7. Sample size:

350 patient medical records.

2.8. Sample selection:

The medical records of total of 281 files were manually reviewed. Acute MI diagnosis and determination of STEMI and NSTEMI was confirmed by a cardiologist notes, evidence of the ECG, and the daily clinical assessment note.

2.9. Inclusion criteria

- Patients who had first time MI
- Age between 20 to 60 years
- Treatment started within first 3 hours of symptoms

2.10. Exclusion criteria:

- Treatment started after 3 hours when symptoms appeared.

- Patients with recurrent MI or having comorbidity of cardiovascular disease or hematologic disease.
- Patient older than 60 or younger than 20.
- Pregnant woman.
- Immune-compromised or HIV Patients
- Patients with Malignancy.

2.11. Data collection method

A liker scale Google questionnaire form application was used with independent variables to obtain demographic data of patients. The Questionnaire form was filled out electronically using portable computers through Informed consent from medical director of KSMC.

2.12. Instruments

The secondary data has been collected from the medical records of the patients having admitted to the cardiology department before and after the month of January 2018.

2.12.1. Demographics

Includes medical record number, age, sex, nationality, job description, Height, Weight and (BMI).

2.12.2. Clinical /Habit History

Present complaint/illness, duration of symptoms, admission diagnosis, smoking status, chronic medical illness, Body Mass Index, LDL-cholesterol level, and family history of MI.

2.12.3. PCI & Staff

PCI has been done or not, type of intervention, date and time of arrival to cardiac catheterization lab, and admission to PCI suite time.

2.12.4. In-Hospital course

Arrival date and time to ED, ED physician assessment time, medications given within 90 minutes of symptoms and on arrival to ED, CCU admission date and time, and CCU discharge date and time.

In the questionnaires form, we added LDL-Cholesterol level, which is predominately one of known risk factor in development of ACS.

2.12.5. Discharge

Discharge diagnosis, date and time, and medication.

2.13. Data Analysis Procedure:

Data is to be analyzed by using Microsoft excel 2016 illustrating Pie charts, tabular charts, and descriptive Statistics based on (duration, percentages, and frequencies) and mean.

2.14. Budget:

600 Saudi Riyals

2.15. Ethical Approval:

Nil

2.16. Limitations:

One of unavoidable and largest limitation, was short time between cardiac catheterization suite that was commenced on (Oct. 2017 until its full operation on Dec. 2017) and secondly our sample size was not large enough, to attribute more favorable results, if more amount of time would have been utilized during data collection. There are also some variations between different centers of cardiac emergency in Saudi Arabia, although this could be an advantage, because our study provides a more reliable approximation to actual variability compared with other hospitals in Saudi Arabia.

3. RESULTS

A total of 35 patients who were fit into the inclusion criteria for acute MI during the periods before and after cardiac catheterization start (Figure 1). Patients who died during their admissions were excluded.

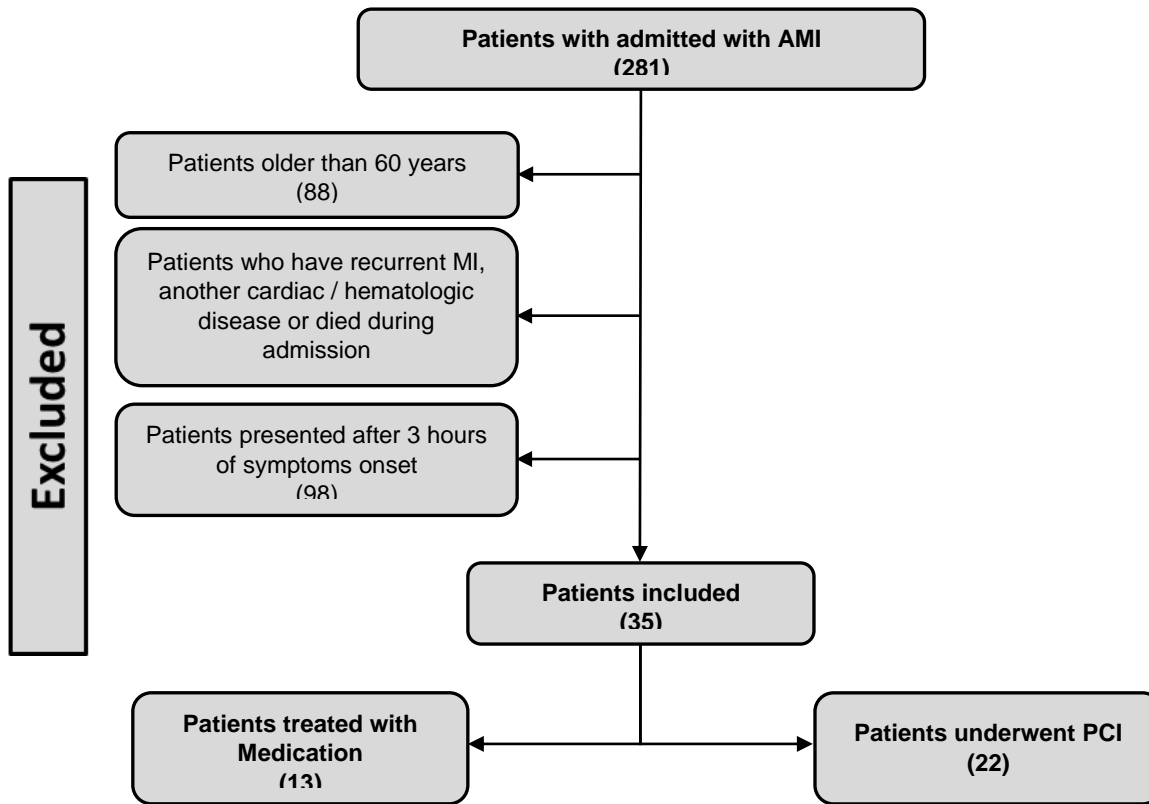


Figure:1 Patients Selection Criteria and Sampling.

3.1. VARIABLES LIST & CODING:

VariableType

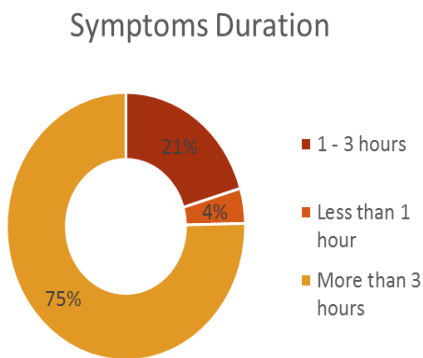
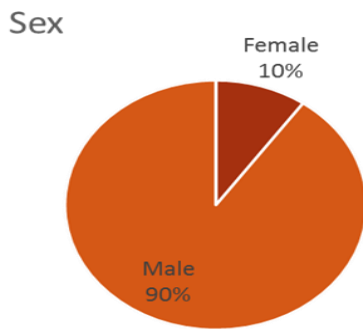
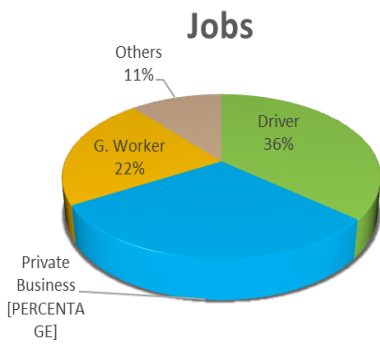
Demographics	
MRN (Nominal)	
DOB (Continuous)	MM-DD-YYYY
Sex (Dichotomous)	0 Male ⁽¹⁾ 0 Female ⁽⁰⁾
Nationality (Nominal)	
Job (Nominal)	
Clinical/Habit History	
Presenting Illness (Nominal)	
Pre-hospital symptoms duration (Continuous)	HH:MM 0 No ⁽⁰⁾
Smoking (Dichotomous)	Yes ⁽¹⁾
Diabetes (Dichotomous)	0 No ⁽⁰⁾
HTN (Dichotomous)	0 No ⁽⁰⁾
Obesity (Dichotomous)	Yes ⁽¹⁾
Low HDL (Dichotomous)	0 No ⁽⁰⁾
Family History (Dichotomous)	Yes ⁽¹⁾
	0 No ⁽⁰⁾
	Yes ⁽¹⁾
	0 No ⁽⁰⁾
	Yes ⁽¹⁾

	0 Yes ⁽¹⁾	0 No(0)
Clinical Pathway Applied	0 No-Intervention ⁽⁰⁾	0 Intervention ⁽¹⁾
Arrival date to ED (Continuous)	MM-DD-YYYY	
Arrival time to ED (Continuous)	HH:MM	
ED physician assessment time (Continuous)	HH:MM	
Medications on time (Dichotomous)	0 Yes ⁽¹⁾	0 No(0)
Medications given(Nominal):		
Time arrived to cardiac cath. Suite (Continuous)	HH:MM	
Duration of Procedure (Continuous)	HH:MM	
Type of intervention done (Nominal) = Complication (Nominal)	0 Yes:...	0 No(0)
In-hospital course		
Symptoms decreased (Dichotomous)	0 Yes ⁽¹⁾	0 No(0)
CCU LOS [days] (Continuous)	DD:HH	
Hospital LOS [days] (Continuous)	DD:HH	
Discharge date (Continuous)	MM-DD-YYYY	
Discharge Medications (Nominal)		
Staff Satisfaction		
ED Door to PCI suite time (Continuous)	HH:MM	
Time to initiate the Medications (Continuous)	HH:MM	
Post PCI treatment CCU LOS (Continuous)	DD:HH	
Post non-PCI treatment CCU LOS (Continuous)	DD:HH	

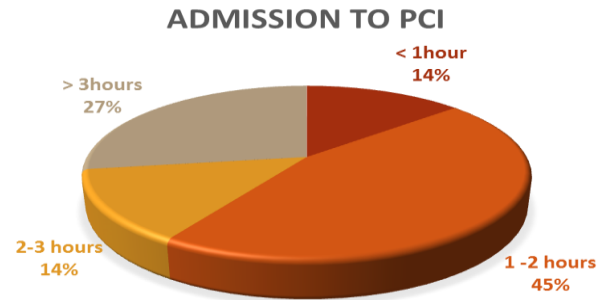
3.2 Patient demographics

Age	53 years (27-60)
Sex	97% (Male) vs. 3% (Female)

Age (patients admitted with MI)	53 (26-82)
Chest Pain (143)	100 %
DM (64)	45 %
Smoker (62)	43 %
HTN (58)	40 %
Healthy (24)	17 %
Smoker + HTN + DM (11)	8 %
BMI (17-42.6)	Av.: 27.12

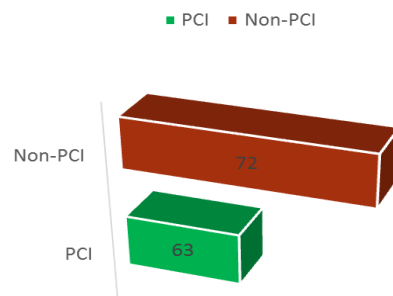


Presenting Illness	100% Chest Pain
Smoking	48%
Diabetes	31%
HTN	37%
Family History	6%
Healthy (no prev. illnesses)	20%

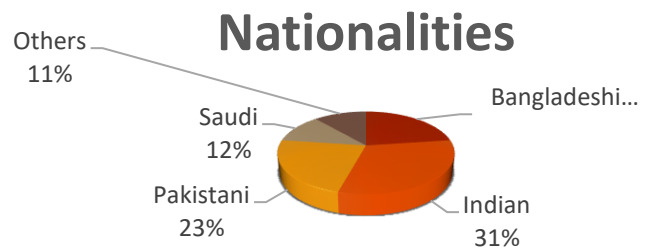


Average emergency department door to PCI Suite Time 06:08(00:25 --- 20: 35)

Average Hospital LOS (Hours)



Average inpatient hospital course average CCU LOSs [days] 66 hours (5-260).



4.DISCUSSION

This study was conducted through a descriptive analysis on demographic data of patients at King Saud medical City, Riyadh. In the questionnaire form independent variables were used. The quantitative data were coded and entered in Microsoft Excel 2016 in order to analyze

the generated demographic data. Then descriptive statistical analyses were employed. Data were also summarized using tabular chart presentations for the interpretation of the findings and Statistics were based on (durations, percentages, and frequencies). The data had been collected from patients' files in the medical records over 3 weeks (25 March and 12 April 2018), during this period, 281 patients' files have been reviewed and data were submitted using the Google forms through portable computers and cellphone Google's application. All files for patients who their ages 20 and 60 were entered and the patients who expired due to recurrent MI, or from previous cardiac hematologic disease were about 50, However, Patients having presented with symptoms onset within 3 hours were 98 recorded. While, number of included patients according to our selection criteria were about 35 where patients that were treated with medications were about 13 and the remaining patients who went through percutaneous coronary intervention procedure were about 22. Based on the results, average age of patients with MI was recorded 53 years (from 26 to 82 age limit). About 143 patients had complain of chest pain (100%), and 64 patients (45%) had previous history of DM, moreover about 62 (43%) were smokers, Remaining 58 files (40%) showed hypertension, 24 files (17%) were recorded healthy, while remaining files 11 (08%) contributed patients with comorbidities (Smoker + Hypertension+ Diabetes Mellitus). In terms of demographics for sex, males were about 97% and 03% were females. Based on jobs, about 36% were drivers, 22% were government workers and remaining 31 were private employees. Secondly symptoms duration was for (83%) for 1-3 hours and 17% for the patients who had onset less than 1 hour. The percentage of Admission to PCI was observed about 27% for 3 hours, 14% for both 2-3 hours and less than 1 hour and 45% for 1-2 hours. Although during average length of stay from emergency department to PCI suite time about 72 patients were treated with non-PCI and 63 patients were treated with PCI procedure.

5.CONCLUSION

To conclude, the length of hospital stay has been considered as a measure of efficiency for patients with AMI has progressively decreased corresponding to 30%-50% of period compared to 15-20 years ago. Studies

have shown that ≤ 3 days hospital stay of patients with an uncomplicated, low-risk AMI is safe and cost-effective, and not associated with higher rates of re-hospitalization or of post discharge mortality, while long hospital stays >10 days were associated with significantly higher mortality. Even with PCI complications, which reached up to 1.5 for AMI patients who underwent this procedure, and mortality that been figured within the first month of the procedure, patients with AMI will have significantly higher rate of cardiac death and major adverse events if not treated with PCI. In addition to significant decreases in both mortality and complications, patients who underwent cardiac catheterization had shorter LOS.

6.RECOMMENDATIONS

Based on our results, the education to the patients about the chest pain and its character has to be carried on to the public, as almost one third of patients with chest pain presented after the golden period of PCI and the Initiation of early transportation of patients with AMI to the cardiac center which has cardiac catheterization suite is highly recommended, to avoid the unwanted complications.

7.CONFLICTS OF INTERESTS

The authors have no conflicts of interest relevant to this article.

8.ACKNOWLEDGEMENT

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