



FREQUENCY OF IMPLEMENTATION OF GUIDELINE RECOMMENDED EFFECTIVE SECONDARY PREVENTION DRUG THERAPY AFTER MYOCARDIAL INFARCTION AND ITS IMPACT ON RE-HOSPITALIZATION

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SA: Conducted the study and wrote the article. IH: Helped in review the article. AI: Re-arranged data and corrected article. GA: Tables and figures. MSK and KS made corrections and did the proof reading.

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ABSTRACT

INTRODUCTION: The use of medications like beta-blocker, a lipid lowering agent, an angiotensin converting enzyme (ACE) inhibitor or angiotensin receptor blocker, and antiplatelets have been estimated to decrease the coronary heart disease related events according to guideline recommendations. The purpose of this study was to determine the frequency of implementation of secondary prevention drug therapy (antiplatelets, ACE inhibitor, β -blockers and statins) after Myocardial infarction and to compare the frequency of re-hospitalization at 1 month in patients with and without implementation of guideline recommended secondary prevention drug therapy.

MATERIAL AND METHODS: We conducted this study in Punjab Institute of Cardiology, Lahore from Feb 25, 2016 to Aug 25, 2016. One hundred and forty patients having diagnosis of myocardial infarction were evaluated for their discharge medicines according to guidelines as per operational definition. Patients were then followed for one month and interviewed regarding re-hospitalization through outpatient department visits and/or telephone contact.

RESULTS: A total of 140 patients were studied. Mean age of the study group was 54.72 ± 9.87 years. Frequency of implementation of secondary prevention drug therapy for secondary prevention of myocardial infarction as recommended by guidelines was recorded as 60.71% (n=85), comparison of frequency of re-hospitalization at 1 month in patients with and without implementation of guideline recommended secondary prevention drug therapy showed that out of 85 cases of implemented guidelines 5.88% (n=5) were re-hospitalized while out of 55 cases with non-implementation of guidelines 12.73% (n=7) were re-hospitalized, p value was calculated as 0.21 showing in-significant difference.

CONCLUSION: The frequency of implementation of secondary prevention drug therapy of myocardial infarction as recommended by guidelines needs to be improved which will further be helpful for reduction in re-hospitalization after discharge from the hospital and will lead to improvement in clinical practice in the field of cardiology.

KEYWORDS: Myocardial infarction, implementation of secondary prevention drug therapy, re-hospitalization.

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INTRODUCTION

Coronary heart disease is the major cause of mortality worldwide¹. Deaths from cardiovascular disease are among the top in Pakistan as compared to other Asian countries, an estimates of 2008 shows mortality from cardiovascular disease exceeding 400 per 100000 population in Pakistan². Acute coronary syndrome comprising unstable angina, non-ST-segment elevation myocardial infarction, and ST-segment elevation myocardial infarction are grave disorders as prime causes of emergency medical care and hospitalizations in the United States³. Secondary prevention after myocardial infarction can minimize repeated events which consists of risk factor management, lifestyle modification and medication therapy. In Pakistan AHA guidelines are the followed by majority of tertiary care hospitals. According to American College of Cardiology/American Heart Association (ACC/AHA), guidelines recommend Aspirin, Clopidogrel, β -blockers, Statins and Angiotensin converting enzymes inhibitors/Angiotensin Receptor Inhibitor (ACEI/ARB) after Myocardial infarction for secondary prevention as evident by clinical trails⁴⁻⁶. According to an international survey 87% patients receive 3 out of five drugs (ACEI, statins and β -blockers) needed for the secondary prevention.⁷

Another study demonstrated that only around 63% of the patients receive combination of the all drugs at discharge⁸ and a study carried out in Korea showed only 50.4% of the patients receive all required medication.⁹ So it is seen that practical implementation of Guideline directed medical therapy is variable among different health systems and it is significant measure of quality of care of that system. Furthermore there are only few international studies that have established the positive impact of combination therapy on reducing mortality and re-hospitalization.¹⁰⁻¹²

The objective of our study is to assess whether patients after myocardial infarction are receiving proper guideline recommended treatment in terms of five key drugs aspirin, clopidogrel, ACE inhibitor, β -blockers and Statins at discharge and their effect on re-hospitalization at 1 month. There is no local data available to what extent patients are receiving these secondary prevention drugs after myocardial infarction. Also results of impact of guideline recommended treatment on re-hospitalization will further encourage physician to prescribe all the necessary medications as recommended by guidelines.

MATERIAL AND METHODS:

This descriptive case series was done in Punjab Institute of Cardiology, Lahore from Feb 25, 2016 to Aug 25, 2016. A sample size of 140 was calculated with 95% confidence level, 8% margin of error and anticipated prevalence of implemented guidelines recommended secondary prevention drug therapy as 63%⁸ at discharge among patients with myocardial infarction.

Inclusion criteria were age 18-75 years, both genders, patients who were discharged with diagnosis of myocardial infarction.

Exclusion criteria were patients with contraindication to ACE inhibitors that are bilateral renal artery stenosis and documented hyperkalemia >5.0 mmol/L, patients with contraindication to β -blockers that are asthma, second or third degree block, heart rate of <50 b/min or PR duration of >0.24 sec, patients with contraindication to Aspirin and Clopidogrel that is history of major bleeding (active GI bleeding, Intracranial bleed etc) or allergy to aspirin, patients with contraindication to statin that is active liver disease and pregnancy, patients who were non compliant to medication. Patients who were discharged with diagnoses of myocardial infarction were assessed for their prescribed drugs and medical records and history was reviewed. The drugs prescribed according to guidelines of AHA/ACC were noted in proforma. Implementation of guideline was assessed through discharging card as per operational definition. Patients were then followed for one month and interviewed regarding their re-hospitalization either through OPD visit or through telephone contact.

STATISTICAL ANALYSIS:

Data was analyzed using SPSS version 22. Frequencies and percentages were expressed for qualitative variables like gender, implementation of secondary prevention and re-hospitalization. Quantitative variables like age was expressed by Mean \pm S.D. Data was stratified for age, gender and STEMI/NSTEMI to deal with the effect modifiers. P-value ≤ 0.05 was considered significant.

RESULTS:

Mean age of total of 140 cases was 54.72 ± 9.87 years-Table 1. 38.57% (n=54) were between 18-50 years while 61.43% (n=86) were between 51-75 years of age. Gender distribution showed that 55% (n=77) were male and 45% (n=63) were females-Table 2. Frequency of implementation of secondary prevention drug therapy for secondary prevention of myocardial infarction as recommended by guidelines was recorded as 60.71% (n=85)

while 39.29%(n=55) had findings of no implementation of guidelines-Table 3. Frequency of STEMI/non-STEMI was recorded as 42.86%(n=60) had STEMI while 57.14%(n=80) had Non-STEMI-Table 4. Comparison of frequency of re-hospitalization at 1 month in patients with and without implementation of guideline recommended secondary

Table-1: Age distribution (n= 140)

Age(in years)	No. of patients	%
18-50	54	38.57
51-75	86	61.43
Total	140	100
Mean±SD	54.72±9.87	

Table-2: Gender distribution (n= 140)

Gender	No. of patients	%
Male	77	55
Female	63	45
Total	140	100

Table-3: Frequency of implementation of secondary prevention drug therapy for secondary prevention of myocardial infarction as recommended by guidelines (n= 140)

Implementation of guidelines	No. of patients	%
Yes	85	60.71
No	55	39.29
Total	140	100

Table-4: Frequency of STEMI/NSTEMI (n= 140)

STEMI/Non-STEMI	No. of patients	%
STEMI	60	42.86
Non-STEMI	80	57.14
Total	140	100

Table-5: Comparison of frequency of re-hospitalization at 1 month in patients with and without implementation of guideline recommended secondary prevention drug therapy

Re-hospitalization	Implementation of guidelines (n=85)		Non-implementation of guidelines (n=55)		P value
	No. of patients	%	No. of patients	%	
Yes	5	5.88	7	12.73	0.21
No	80	94.12	48	87.27	
Total	85	100	55	100	

prevention drug therapy showed that out of 85 cases of implemented guidelines 5.88%(n=5) were re-hospitalized while out of 55 cases with non-implementation of guidelines 12.73%(n=7) were re-hospitalized, p value was calculated as 0.21 showing in-significant difference-Table 5.No death was reported.

DISCUSSION:

Medications for the treatment and prevention of coronary heart disease related events have been subjected to rigorous evaluation in trials involving

hundreds of thousands of patients, and practice guidelines recommend that post-MI patients receive treatment with a beta-blocker, a lipid lowering agent, an angiotensin converting enzyme (ACE) inhibitor or angiotensin receptor blocker, and antiplatelets unless a contraindication exists. Taken in combination, these drugs have been estimated to reduce the coronary heart disease mortality.

We planned this study to evaluate whether patients are receiving proper guideline recommended treatment in terms of above five key drugs at discharge as recommended by guidelines and their effect on Re-hospitalization at 1 month after myocardial infarction.

In our study, mean age was calculated as 54.72±9.87 years, 55%(n=77) were male and 45%(n=63) were females, frequency of implementation of secondary prevention drug therapy for secondary prevention of myocardial infarction was recorded as 60.71%(n=85), comparison of frequency of re-hospitalization at 1 month in patients with and without implementation of guideline recommended secondary prevention drug therapy showed that out of 85 cases of implemented guidelines 5.88%(n=5) were re-hospitalized while out of 55 cases with non-implementation of guidelines 12.73%(n=7) were re-hospitalized, p value was calculated as 0.21 showing in-significant difference.

We compared our results with previous literature, where 87% patients received 3 out of five drugs (ACEi, statins and β-blockers) required for the secondary prevention.⁷ This frequency was higher as compared to recorded in our study. Another study showed that only around 63% of the patients receive combination of the all drugs at discharge.⁸ These findings are in agreement with our results. Another study conducted in Korea showed only 50.4% of the patients receive all required medication.⁹ Their results are lower than recorded in our study.

Many studies have demonstrated the positive impact of individual drug but there are only few international studies that have demonstrated the positive impact of combination therapy on decreasing mortality and Re-hospitalization¹⁰⁻¹². Tuppin P et al showed decreased hospitalization (6.7% vs. 9.9%) after combination therapy as compared to patients not taking medication with hazard ratio of 1.43. These findings are consistent with our results.

However, in our study we included only re-hospitalization within 30 days of discharge from



hospital, and needs to study other variables like type of MI, LVEF etc. in subsequent research studies.

Our results are helpful for the guidelines for

treatment on re-hospitalization and further encouraging for physician to write all the drugs as recommended by guideline.

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