

Medication Adherence in Post Myocardial Infarction Patients at Shahid Gangalal National Heart Centre

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Abstract

Background and Aims: Medication adherence among Post myocardial infarction (MI) patient is suboptimal all over the world. Although significant advances have been made in the diagnosis and management of Acute Myocardial Infarction, it is still a major cause of morbidity and mortality worldwide and significant therapeutic challenges to the society. The purpose of the study was to study the medication adherence and to identify the effect of adverse drug reaction (ADR) on medication adherence.

Methods: The study was a single center, prospective study carried out in Shahid Gangalal National Heart Centre (SGNHC) in Nepal. The enrolled patients were followed up at 6th weeks after discharge in outpatient department (OPD) visit. Patients were interviewed with Morisky Green Levine (MGL) adherence scale questionnaire to identify medication adherence. The ADR was assessed. Data were analyzed in SPSS version 20.

Results: A total of 134 patients were included in the study. The study showed post MI patient were highly adherent to medication (92.5%). ADR was not significantly associated with medication adherence.

Conclusion: Patients were highly adherent to medication and the effect of ADR on medication adherence was not significant.

Keywords: Myocardial Infarction, Medication Adherence, Adverse Drug Reaction

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Introduction

As per world health organization (WHO) statistics in 2015 cardiovascular diseases are the leading cause of death (31% of all global death) about of 17.7 million people every year. More than 80% cardiovascular diseases are due to MI and stroke.¹ MI is a major cause of death and disability worldwide.² After the treatment of patient in Intensive care unit, their follow up and medication adherence is equally important to minimize the probability of reoccurrence.³ The medication adherence rates of cardiovascular drugs were low in the South East Asian Countries including Nepal, India, Pakistan, Bangladesh, and Sri Lanka which suggest a growing need for future interventions to improve adherence.⁴ A review of medication adherence among native and immigrant South Asians found that the primary factors related to non-adherence were forgetfulness, side-effects and not wanting to take the medication.⁵ Non adherence to medication remain a major problem for cardiovascular patients which lead to poor clinical outcomes, including re-hospitalization, subsequent MI and increased mortality.⁶ In spite of prescribing appropriate medication after post MI at hospital discharge, non-adherence still exists. One of the factors responsible for predicting admission due to non-compliance was adverse drug reactions.⁷ To the best of our knowledge and search, there are limited study regarding the effect of ADR on medication adherence in MI

patients in Nepalese setting. Main aim of our study was study the medication adherence among post MI and to see the effect of ADR on medication adherence.

Methods

The study is an interview-based observational study. The study was conducted in the outpatient department of SGNHC located in Banskari of Kathmandu District. SGNHC is 200 bedded which was established in 1995. The data collection period was approximately about three months, starting from May 15 2018 to July 15 2018. The sampling method was non-probability purposive sampling. Sample size constituted of 134 post MI patients. Participants with newly diagnosed post MI patients were identified in Intensive care unit (ICU), Medical intensive care unit (MICU), Coronary care unit (CCU) and the chest pain ward of SGNHC and who met the eligibility criteria were requested for participation in the study. Patients were verbally informed about the research and the researcher. Informed consent was taken of patients who were willing to give consent. The inclusion criteria were newly diagnosed post MI patient who were willing to give consent and whose ages group were between 25 to 70 years. The exclusion criteria, on the other hand was patient with cardiac disease other than MI, old post MI patients, mentally unstable patients, patients who cannot take medicine by themselves.

Data were collected from patients who were followed up in OPD after sixth week after cardiac event. During the interview, data was collected on patient demographic details (age, gender, occupation, address, monthly income, education, habits such as smoking and drinking, past history of similar episode of MI, co-morbidities, treatment method) and medications characteristics. The study was started after getting approval from institutional review board of SGNHC. The questionnaire was divided into two parts. The first part of questionnaires, prepared by the researcher, involved questions to gather general information about the patients including information about disease and suspected ADR experienced by patient. (ANNEX-I) The second part involves Morisky, Green and Levine (MGL scale) 4- item questionnaire (MGL scale) for measurement of adherence(ANNEX-II) . These MGL scale is validated set of questionnaire translated in Nepali and validated to measure medication adherence. In scoring of MGL Scale (4-items); for each questions from 1 to 4, a “No” response from the patient got “0” point and “Yes” response got “1” point. Total score was then calculated out of 4 points and adherence level was categorized into high, medium and low adherence based in the source. The scores and the adherence level were 0 for high adherence, 1-2 for medium adherence and 3-4 for low adherence. In scoring of MGL Scale (4-items); for each questions from 1 to 4, a “No” response from the patient got “0” point and “Yes” response got “1” point. Total score was then calculated out of 4 points and adherence level was categorized into high, medium and low adherence based in the source. The scores and the adherence level were 0 for high adherence, 1-2 for medium adherence and 3-4 for low adherence.⁸

Patient who complained of having ADR were identified. Patients were categorized as having an ADR if (a) signs and or symptoms are consistent with the known adverse effect profile of the drug (according to the British National Formulary, (b) if there is a temporal relation of features with the start of drug therapy, and(c) if, after appropriate investigations, other causes are excluded. The reliability of the questionnaire was assessed by Cronbach’s alpha coefficient and for validity extensive literature review was conducted.

Statistical Analysis

SPSS version 20 was used to compute the descriptive analysis of patient demographics and medication adherence. Categorical variables were measured as percentages,

while continuous variables were expressed as mean \pm standard error of mean along with standard deviation.

Results

Out of the 134 patients studied, 95(71%) were male and 39(29%) were female. The average age of the patient was 53.72 \pm 11.35 years, and majority of the patients were from the age group 60-70 years (44%).Majority of the patient’s occupation were house worker followed by one’s own business. About 44.8% of the patients were uneducated, 29.9% had not completed high school level, 14.2% had only completed high school level, 7.5% had completed graduate level and 3.7% had completed post graduate level. In the present study, 48.5% of patient did not had any income,29.9% had income below Rs20000 ,17.2% had income in between Rs 20000 to Rs40000 and only 4.5% of patient had income above Rs. 40,000.

Table 1: Adherence level of the post myocardial infarction patients as determined by MGL scale

Month	High adherence (Score=0) n (%)	Medium adherence (Score=0) n (%)	Low adherence (Score=0) n (%)
Six week	124(92.5)	7(5.2)	3(2.2)

In the present study 92.5% of patients were highly adherent, 5.5% were moderate adherent and 2.2% of patient were low adherent to medication.

Table 2: Age and sex versus Medication Adherence characteristics

Characteristic	Highly adherent	Medium adherent	Low adherent
Age (years), n (%)			
20-29	5(4)	0(0)	0(0)
30-39	11(8.9)	1(14.3)	2(66.7)
40-49	23(18.5)	0(0.0)	0(0.0)
50-59	31(25)	2(28.6)	0(0.0)
60-70	54(43.5)	4(57.1)	1(33.3)
Sex, n (%)			
Male	87(70.2)	5(71.4)	3(100)
Female	37(29.8)	2(28.6)	0(0.0)

Table 3: Occupation, Education and Income versus Medication adherence characteristics

Characteristic	Highly adherent	Medium adherent	Low adherent
Occupation (%)			
Office	25(20.2)	2(28.6)	0(0.0)
Farmer	9(7.3)	1(14.3)	0(0.0)
House worker	51(41.1)	3(42.9)	0(0.0)
Business	31(25)	1(14.3)	1(33.3)
Others	8(6.5)	0(0.0)	2(66.7)
Education, n (%)			
Uneducated	55(44.4)	5(71.4)	0(0.0)
Below high school level	38(30.6)	1(14.3)	1(33.3)
High school level completed	18(14.5)	0(0.0)	1(33.3)
graduate level completed	8(6.5)	1(14.3)	1(33.3)
Post graduate level completed	5(4)	0(0.0)	0(0.0)
Monthly Income, n (%)			
Without income	62(50)	3(42.9)	0(0.0)
Below 20000	34(27.4)	4(57.1)	2(66.7)
20000-40000	23(18.5)	0(0.0)	0(0.0)
Above 40000	5(4)	0(0.0)	1(33.3)

Table 4: ADR reported by patients

Side effects of patients	Response Number	Percentage
Dry cough	14	19.7%
Gastritis	8	11.3%
Headache	5	7.0%
Anorexia	1	1.4%
Allergy	2	2.8%
Nausea	3	4.2%
Malaise	3	4.2%
Edema	3	4.2%
Tinnitus	1	1.4%
Bleeding	1	1.4%
Back pain	1	1.4%
Wheezing	2	2.8%
Anxiety	2	2.8%

In the present study, dry cough (19.7) and gastritis (11.3) were the most reported ADR by the patients. Aspirin (100%), Clopidogrel(99.3%), Statins (98.5%) Angiotensin converting enzyme inhibitors (ACE inhibitors) (65.7), b blocker (76.8%) and Pantoprazole (74.6) are the most prescribed medicine.

Table 5: Correlation between ADR and level of adherence (MGL scale)

Characteristic ADR	High adherence n (%)	Medium adherence n (%)	Low adherence n (%)	P value
No	116(93.5)	7(100)	3(100)	0.71
Yes	8(6.5)			

In the present study, medication adherence was not significantly associated with ADR. (p=0.71).

Discussion

Medication non-adherence is a widespread problem in the healthcare system which reflects a gap between provider and patient perception about treatment benefits.⁹⁻¹² Medication adherence after MI is common as it can lead to further complication to mortality risk.¹³ Here, in our study we found that the patients were highly adherent to the medication.

In the present study majority of the patient were highly adherent (92.5% of patients are highly adherent, 5.5% are moderately adherent and 2.2% of patient are minimally adherent to medication). In similar study, Mathews Robin and et.al concluded that only 71% were highly adherent, 25% were moderately adherent and 4% were

minimally adherent to medication by 6 weeks after their MI. Patients who had follow up appointment before discharge, those who had been explained about the side effects, engaged in regular exercise post discharge are more likely to be adherent.¹⁴

The reason behind high adherence in present study may be the counseling done to the patients before discharge. Patients were counseled about strict follow up at 1st and 6th week of discharge, regular intake of medicine, balanced diet and exercise. Medication adherence to post MI from other studies was 50.4% which showed that medication adherence was lower in other countries than present study.¹⁵ It may be due to the limitation of our study where only self-administered questionnaire were used as tools to measure medication adherence.

In the present study, majority of the patient are from lower economic strata, house workers and uneducated (44.8%) which is similar to the study conducted by Gurung RB and et.al at Dhulikhel hospital. They reported that ischemic heart disease was more prevalent in low socioeconomic strata where 60% are from rural and 40% are from urban area.¹⁶ In the present study the higher representation of patient from under educated family and lower strata might be due lack of regular health checkup reflecting to scarcity of knowledge and finance. In another study both educational level and income substantially and independently affect mortality after AMI.¹⁷ Lower socioeconomic position is often associated with health-damaging lifestyle resulting in the development of poor dietary habits as well as influencing behaviours related to smoking and physical activity.¹⁸ Individuals with low socioeconomic position are prone to be exposed to multiple risk factors and, therefore, seem to have a dramatically excessive burden of disease.¹⁹ Monthly income of the patient may influence the medication taking behavior in low socio economic position patient. Occupation with busy and hectic schedule may also have direct impact on medication adherence.

Most common ADRs identified was dry persistent cough due to ACE inhibitors. ADR was not significantly associated with medication adherence. (p=0.71) in the present study. In the study conducted by PalaniappanMuthiah et.al. gastritis (20.7%) due to aspirin and dry persistent cough(18.4%) was the most common ADR due to Aspirin and Enalapril.²⁰ It could be explained that adherence to medication was not influenced due to the ADR experienced by the patient because of the patient counseling during discharge.

Limitation

Recall bias, single center, small sample size and limited time frame were the limitation of our study.

Conclusion

Patients were highly adherent to medication and the effect of ADR on medication adherence was not significant. This study will provide framework for similar studies regarding long term medication adherence in post MI patient. Identification of other ADR in long term would help physician to identify different type of ADR and drug interaction which are still lagging in developing country like Nepal.

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Conflict of Interest: None

References

- World Health Organization. Cardiovascular disease [Internet]. 2016 [cited 2016 September 22]. Available from: <https://www.who.int/health-topics/cardiovascular-diseases>
- Thygesen K, Alpert JS, White HD, Joint ESC/ACCF/AHA/WHF Task Force for the Redefinition of Myocardial Infarction. Universal definition of myocardial infarction. *Journal of the American College of Cardiology*. 2007 Nov 27;50(22):2173-2195. <https://doi.org/10.1016/j.jacc.2019.06.016>
- Gonarkar SB, Dhande PP. Medication adherence and its determinants in myocardial infarction patients: An Indian scenario. *Journal of Clinical and Preventive Cardiology*. 2016 Jan 1;5(1):2. DOI: 10.4103/2250-3528.18398
- Akeroyd JM, Chan WJ, Kamal AK, Palaniappan L, Virani SS. Adherence to cardiovascular medications in the South Asian population: a systematic review of current evidence and future directions. *World Journal of Cardiology*. 2015 Dec 26;7(12):938. DOI: 10.4330/wjc.v7.i12.938
- Ens TA, Seneviratne CC, Jones C, Green TL, King-Shier KM. South Asians' cardiac medication adherence. *European journal of cardiovascular nursing*. 2014 Aug 1;13(4):357-368. <https://doi.org/10.1177/1474515113498187>
- Baroletti S, Dell'Orfano H. Medication adherence in cardiovascular disease. *Circulation*. 2010 Mar 30;121(12):1455-1458. <https://doi.org/10.1161/CIRCULATIONAHA.109.904003>
- Col N, Fanale JE, Kronholm P. The role of medication noncompliance and adverse drug reactions in hospitalizations of the elderly. *Archives of internal medicine*. 1990 Apr 1;150(4):841-845. doi:10.1001/archinte.1990.00390160093019
- Beyhaghi H, Reeve BB, Rodgers JE, Stearns SC. Psychometric properties of the four-item morisky green levine medication adherence scale among atherosclerosis risk in communities (ARIC) study participants. *Value in Health*. 2016 Dec 1;19(8):996-1001. <https://doi.org/10.1016/j.jval.2016.07.001>
- Osterberg L, Blaschke T. Adherence to medication. *New England journal of medicine*. 2005 Aug 4;353(5):487-497. doi: 10.1056/NEJMr050100
- Jackevicius CA, Mamdani M, Tu JV. Adherence with statin therapy in elderly patients with and without acute coronary syndromes. *Jama*. 2002 Jul 24;288(4):462-467. doi:10.1001/jama.288.4.462
- Baroletti S, Dell'Orfano H. Medication adherence in cardiovascular disease. *Circulation*. 2010 Mar 30;121(12):1455-1458. <https://doi.org/10.1161/CIRCULATIONAHA.109.904003>
- Marshall IJ, Wolfe CD, McKevitt C. Lay perspectives on hypertension and drug adherence: systematic review of qualitative research. *Bmj*. 2012 Jul 9;345. doi: <https://doi.org/10.1136/bmj.e3953>
- Ho PM, Spertus JA, Masoudi FA, Reid KJ, Peterson ED, Magid DJ, Krumholz HM, Rumsfeld JS. Impact of medication therapy discontinuation on mortality after myocardial infarction. *Archives of internal medicine*. 2006 Sep 25;166(17):1842-47. doi:10.1001/archinte.166.17.1842
- Mathews R, Peterson ED, Honeycutt E, Chin CT, Efron MB, Zettler M, Fonarow GC, Henry TD, Wang TY. Early medication nonadherence after acute myocardial infarction: insights into actionable opportunities from the Treatment with ADP receptor inhibitorS: Longitudinal Assessment of Treatment Patterns and Events after Acute Coronary Syndrome (TRANSLATE-ACS) study. *Circulation: Cardiovascular Quality and Outcomes*. 2015 Jul;8(4):347-356. <https://doi.org/10.1161/CIRCOUTCOMES.114.001223>
- Molloy GJ, Perkins-Porras L, Bhattacharyya MR, Strike PC, Steptoe A. Practical support predicts medication adherence and attendance at cardiac rehabilitation following acute coronary syndrome. *Journal of psychosomatic research*. 2008 Dec 1;65(6):581-586. <https://doi.org/10.1016/j.jpsychores.2008.07.002>
- Gurung RB, Pant P, Pokharel B, Koirala R, Bedi TR. Review of ischemic heart disease patients admitted in Dhulikhel hospital. *Nepalese Heart Journal*. 2010;7(1):1-4. <https://doi.org/10.3126/njh.v7i1.8493>
- Rasmussen JN, Rasmussen S, Gislason GH, Buch P, Abildstrom SZ, Køber L, Osler M, Diderichsen F, Torp-Pedersen C, Madsen M. Mortality after acute myocardial infarction according to income and education. *Journal of Epidemiology & Community Health*. 2006 Apr 1;60(4):351-6. <http://dx.doi.org/10.1136/jech.200X.040972>
- Kaplan GA, Keil JE. Socioeconomic factors and cardiovascular disease: a review of the literature. *Circulation*. 1993 Oct;88(4):1973-1998. <https://doi.org/10.1161/01.CIR.88.4.1973>
- Ruberman W, Weinblatt E, Goldberg JD, Chaudhary BS. Psychosocial influences on mortality after myocardial infarction. *New England journal of medicine*. 1984 Aug 30;311(9):552-559. DOI: 10.1056/NEJM198408303110902
- Palaniappan M, SandhiyaSelvarajan MG, Subramaniyan G, Dkhar SA, Pillai AA, Jayaraman B, Chandrasekaran A. Pattern of adverse drug reactions reported with cardiovascular drugs in a tertiary care teaching hospital. *Journal of clinical and diagnostic research: JCDR*. 2015 Nov;9(11):FC01 <https://doi.org/10.7860/JCDR/2015/13810.6704>