

# Adherence to Drug Therapy in Elderly Patients after Hospitalization for Coronary Revascularisation

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**Abstract:** Coronary Artery Disease (CAD) is one of the most common cardiovascular diseases and one of the major problems in health areas worldwide. Medication adherence is an important factor preventing CAD development and post PCI cardiac recurrence. This study mainly focuses on adherence to drug therapy in elderly patients discharged from hospital after coronary revascularisation. This is a prospective study conducted for a period of 6 months in a tertiary care hospital in North Malabar region of Kerala. Men and women aged  $\geq 65$  yrs with an established cardiovascular disease, patient who had undergone coronary revascularisation were included in the study. Drugs included are statins, Angiotensin Converting Enzyme (ACE) inhibitors, anti-platelet drugs, anti-coagulants and anti-hypertensives. A total of 101 patients were included in the study of which 66 were males and 35 were females. The prevalence of medication adherence on first follow up was 100% followed by 53.5% on second follow up 58.4 on third follow up and 65.3% on fourth follow up. Medication adherence was found to be improved in third and fourth followup by applying clinical pharmacist interventions such as medication calendar, telephonic reminding, and patient counselling. This study elaborates a prevalence of 69.3% of adherence in elderly patients after coronary revascularization. With the implementation of medication calendars, telephonic reminding and patient interviews, an improvement of 5.9% was found in medication adherence.

**Keywords:** Medication adherence, Coronary artery disease

## 1. Introduction

Coronary Artery Disease (CAD) is one of the most common cardiovascular diseases and one of the major problems in health areas worldwide. CAD can cause limitations in a person's life for long period. Besides controlling risk factors, treating CAD includes medication treatment and revascularization.

Revascularization involves Percutaneous Coronary Intervention (PCI) and Coronary Artery Bypass Graft Surgery (CABG). PCI patients have to receive multiple drug therapies so as to prevent the cardiac events recurrence such as vascular restenosis. Antiplatelet drugs beta blockers angiotensin converting enzyme inhibitors angiotensin receptor blocker and lipid lowering agents especially statins are the drugs reducing death rate.

Medication adherence is an important factor preventing CAD development and post PCI cardiac recurrence. As per World Health Organisation medication adherence is defined as "the extent to which a person's behavior—taking medication, following a diet, and/or executing lifestyle changes or "The degree to which the persons behaviour corresponds with the agreed recommendations from a healthcare provider". Poor adherence can lead to serious health outcomes.<sup>[1]</sup>

Patient-related factors, Social/economic factors, Provider-patient/health care system related factors, Condition and therapy-related factors are the main factors that determines adherence.

Post PCI medication adherence is really important since non adherence is associated with Major Acute Cardiac Events (MACE) such as death, myocardial infarction, and stroke. Here we concentrate on elderly patients since there are greater chances for non-adherence in this group of population. There is lack of sufficient clinical data regarding the use and adherence to medication after coronary revascularization. This discloses the need of a study in this area. Our study aims to determine the prevalence and impact of adherence to drug therapy in elderly patients discharged from hospital after coronary revascularization. Along with the study of medication adherence if the determining factors for non-adherence are identified, effective strategies can be developed to improve the medication adherence of the patients and increases their quality of life. The study also uses interventions such as medication calendar, patient interview, telephonic reminding to improve patient's drug compliance and also makes a look at how this could affect the patient medication adherence.

## 2. Literature Review

Adherence to cardiovascular medication is of great concern. Several studies were conducted. One of the studies conducted by Kulkarni SP and Alexander K P<sup>[2]</sup> was a prospective study among 1326 patients with coronary artery disease undergoing cardiac catheterization. Adherence to Aspirin, ACE inhibitors, Statins and Beta blockers were studied. Only 54% of total population were adherent to all of the initial medication. Non adherence to statins (28%) and ACE/ARB (28%) were highest compared to aspirin (18%) and BB (22%). From this study they observed that marital

status, mental health, education and total number of medications prescribed were the main factors that influenced adherence.

Disease based adherence to cardiovascular medicines in rural population were observed by Gouranga Sandra<sup>[3]</sup>. This observational study included a total population of 394 patients. Only 280 patients continued the study. Adherence to medication was highest for IHD patients (32%) followed by CCF (28.37%) and hypertension (20.83%). Adherence to cardiovascular medications in rural India was poor. Carelessness was the most common and forgetfulness was the least common cause of non-adherence in those groups of patients.

Cost of certain cardiovascular medication plays an essential role in patient's adherence to medications. Alexander Kulik et.al<sup>[5]</sup> highlights the need for developing cost effective strategies to improve medication adherence after coronary revascularization. Adherence to Statin therapy in Elderly Patients after Coronary Revascularization was the study topic with a sample size of 13,130. Statin adherence was compared in patients with CAD treated with medical therapy (n=3,714), percutaneous coronary intervention (n=6,309), or coronary artery bypass graft surgery (n=3107). Patients treated with percutaneous coronary intervention and coronary artery bypass graft surgery had full adherence rates of 70.6% and 70.2% and significantly lower for patients treated with coronary revascularization compared to patients treated with medical therapy (79.4%,  $p < 0.0001$ ).

K H Leslie et.al<sup>[6]</sup> conducted a study in 2018 on adherence to cardiovascular medication: a review of systematic reviews. Review of published systematic reviews of the factors and outcomes associated with adherence to cardiovascular medication using MEDLINE, Embase, CINAHL and PsycINFO databases. Adherence was associated with disease factors, therapy factors, healthcare factors, patient factors and social factors, though with some inconsistencies. This study focus on the need to develop interventions to improve adherence.

Chong yang liu et.al<sup>[7]</sup> conducted a study in June 20, 2018 on quality assurance and improvement study of surgical coronary revascularization: medication adherence. They developed the multifaceted, patient-centered, smartphone-based Heart Health Application to encourage medication adherence in the intervention group through a health self-management program initiated during hospital admission for CABG.

### 3. Methodology

A prospective study on adherence to drug therapy in elderly patients after hospitalization for coronary revascularisation. The patient who met the study criteria will be included for the study. The patient consent form will be obtained before commencement of the study. A suitable data collection form will be designed for the data collection in excel format. The demographic details and the treatment regimen of selected study population will be entered in predesigned data collection form. The patient will be provided with a

medication calendar showing the medication administration details and patient will be asked to mark in this while taking the medication. The patient will be asked to come for follow up after 3 weeks with the medication calendar. The patient follow up will also did by telephone interview. The medication adherence of the patient will be analysed using medication adherence scale for Cardiac Drug Compliance. The patient compliance towards different class of drugs will be recorded in the data collection form. The patient will be asked to come for 3 more follow up and the procedure will be repeated. All collected data will be analysed at the end of study using appropriate statistical methods.

### 4. Results and Discussion

A total number of 101 patients studied for adherence, of which 66 were males and 35 were females. Age ranged from 65 to 87 years, with a mean of 70.82 years and a standard deviation of 5.73 years.

The prevalence of medication adherence on first follow up was 100% followed by 53.5% on second follow-up, 58.4 on third follow up and 65.3% on fourth follow up. Medication adherence was found to be improved in third and fourth follow-up by clinical pharmacist interventions such as medication calendar, telephonic reminding, and patient counselling.

#### Adherence at the Different Time Points

##### Adherence on First Follow Up

The prevalence of medication adherence on third follow up was found to be 58.4%. The prevalence of medication adherence on first follow up was found to be 100% of which 66 were males and 35 were females.

Adherence	Frequency	Percent
High adherence	101	100.0

##### Adherence on Second Follow Up

The prevalence of medication adherence on second follow up was found to be 53.5%.

Adherence	Frequency	Percent
High adherence	54	53.5
Medium adherence	47	46.5
Total	101	100.0

##### Adherence on Third Follow Up

The prevalence of medication adherence on third follow up was found to be 58.4%.

Adherence	Frequency	Percent
High adherence	59	58.4
Medium adherence	41	40.6
Low adherence	1	1.0
Total	101	100.0

##### Adherence on Fourth Follow Up

The prevalence of medication adherence on fourth follow up was found to be 65.3%.

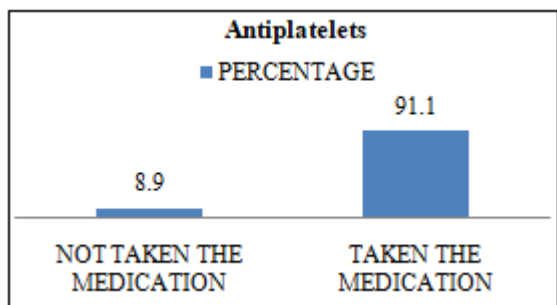
Adherence	Frequency	Percent
High adherence	66	65.3
Medium adherence	35	34.7
Total	101	100.0

During the period of study rate of full adherence increased from 53.5% to 65.3% for the entire cohort. These findings were consistent with study conducted by Alexander kulik et al, in which a significant increase from 70.5% to 75.4% for the entire cohort was noted.

**Adherence Pattern for Different Classes Of Drugs**

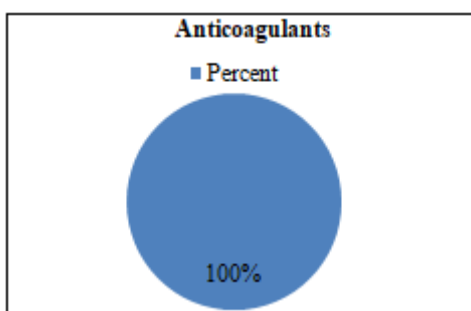
**Adherence to Antiplatelets**

101 patients were prescribed with antiplatelet medication during the study period of which 91.1% patient had taken the medication and 8.9% did not take the medication. According to the study conducted by Sonali P kulkarni et al, 95% of the patients were prescribed with antiplatelet of which 18% of the patients discontinued the medication. Their prevalence of non-adherence was slightly higher than our study. Gastric discomforts caused by this medication might lead to non-adherence.



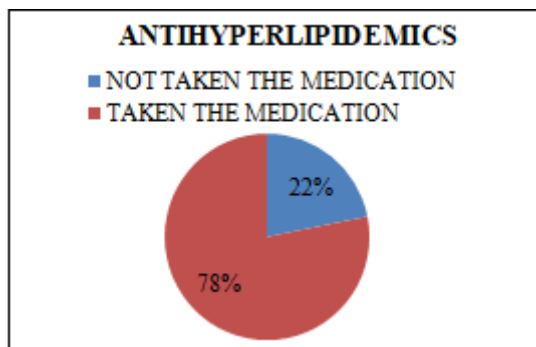
**Adherence to Anticoagulant**

Out of 3 patients who were prescribed with anticoagulants, all of them had taken the medication which indicates high adherence. Short duration of treatment with anticoagulants might contribute to the high adherence.



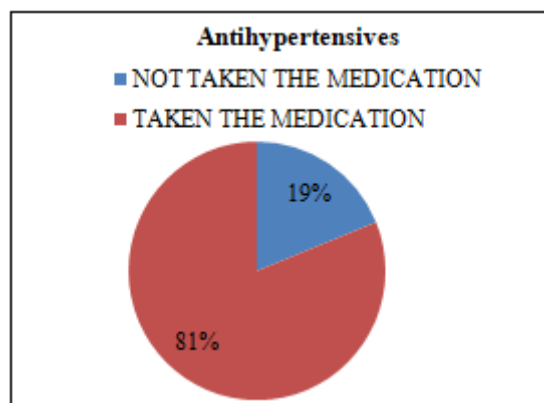
**Adherence to Antihyperlipidemics**

Out of 101 patients who were prescribed with the anti hyperlipidemics, 78.2% of patients had taken the medication and 21.8% patients do not take the medication. According to a study conducted by Sonali P Kulkarni, 55% of the patients were adherent to statins. Study conducted by Alexander Kulik shows 29.5% non-adherence to antihyperlipidemics. The results of our study was consistent with these finding. The high cost of medication might contribute to non-adherence to antihyperlipidemics.



**Adherence to Antihypertensives**

101 patients had prescribed with antihypertensive during the study period of which 81.2% were adherent to the medication and 18.8% shows non-adherence. The study conducted by Sonali P Kulkarni, 25% of the patients was non-adherent to the medication. These findings are in accordance with our study. Occurrence of adverse drug reactions and high cost of the therapy with antihypertensive might had increased non adherence to the medication.



**5. Conclusion**

Medication adherence was found to be improved in third and fourth follow up by applying clinical pharmacist interventions such as medication calendar, telephonic reminding, and patient counselling. An improvement of 5.9% was found in medication adherence.

**6. Future Scope**

**Benefits**

Medication adherence was found to be improved in third and fourth follow up by applying clinical pharmacist interventions such as medication calendar, telephonic reminding, and patient counselling. This improved quality of life of patients.

**Limitation**

The study was conducted for a period of six months only.

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