Original Research Article

Life style patterns and adherence to pharmacotherapy after acute coronary syndrome: one year follow up study from a tertiary care center in Kashmir, India

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ABSTRACT

Background: Acute coronary syndrome is the leading cause of cardiac mortality and morbidity world over. Modification of life style pattern and adherence to pharmacotherapy plays a vital role in primary and secondary prevention of coronary events. This study was aimed at assessing the penetration of life style modifications and adherence to pharmacotherapy after acute coronary event in our population.
Methods: Acute coronary syndrome patients enrolled in the study were examined, interviewed and all the demographic and clinical data was recorded at index event and at 3, 6 and 12 month intervals.
Results: A total of 260 patients were enrolled in the study and followed for 12 months. Mean age of patients was 55.6±8.27 years. Males 78.6% and females 21.5%. Hypertension was risk factor in 67.7%, diabetes in 26.2%, smoking in 63.8%, BMI ≥25 in 67.3% and family history of coronary artery disease in 8.8% of the cases at index event. Uncontrolled hypertension was observed in 30.11%, 38.63% and 44.88% patients at 3, 6 and 12 months follow up. Uncontrolled diabetes at 3, 6 and 12 months was found in 58.82%, 66.17% and 73.52% patients. 5.42%, 15.06% and 21.08% cases continued to smoke at 3, 6 and 12 months respectively. Drug non-compliance overall was noted in 9.61%, 17.69% and 23.84% cases at 3, 6 and 12 month follow up.
Conclusions: This study highlights the under prevalence of modifiable risk factor change in practice and drug non-compliance after an acute coronary event.

Keywords: Acute coronary syndrome, Drug non-compliance, Pharmacotherapy adherence, Risk factors

INTRODUCTION

Acute coronary syndrome continues to be the major contributor to cardiovascular mortality and morbidity.[1] Despite appreciable improvement in the treatment of ACS, the risk of subsequent cardiovascular events and cardiovascular mortality is still high.[2,3]

Specifically, a recent French study attested that total 1-year mortality is 29.3%. Moreover, recurrences at six and twelve months are about 23% and 36%, respectively.[3,4]

The British Heart Foundation stated that ACS is the most preventable manifestation of CVD and secondary prevention should be focused on the adoption of healthier lifestyle behaviours. Additionally, more than 50% in the reduction of ACS mortality is attributable to favourable changes in risk factors, while 43% to new medical and surgical treatment.[5]

Furthermore, the American Heart Association and the American College of Cardiology have strongly recommended that healthier lifestyle patterns can be

regarded as a risk-reduction therapy for secondary prevention of CVD.[6]

Despite the well-known benefits of making healthier choices, it should be acknowledged that patients do not follow the recommended advices, even shortly after an ACS event and accordingly adherence to healthy habits has declined in the last years, posing an alarming increase in the future trends of CVD.[7]

The main cardiovascular risk factors are well known and include diabetes, smoking habit, atherogenic lipid profile, hypertension, and obesity, whereas adherence to a healthy lifestyle comprising Mediterranean dietary profile and moderate-to-high physical activity has been shown to reduce significantly the risk of coronary heart disease (CHD).[8-11]

This study was aimed to study the prevalence of life style patterns and adherence to pharmacotherapy after an acute coronary event.

METHODS

Patients admitted in department of cardiology SKIMS as acute coronary syndrome over a period of two years from January 2017 to February 2019 were enrolled in the study after taking proper consent.

Patients were interviewed and examined while in hospital at the time of acute event. Information about demographics, medical history, and family history of coronary or other atherosclerotic disease, medications and lifestyle habits in relation to smoking habits, diet and physical exercise was obtained. Baseline workup including CBC, KFT, LFT, Lipid Profile and HBA_1C in known cases of diabetes or newly detected diabetes was recorded. Treatment at the time of acute event (PCI/Thrombolysis) and discharge was recorded. Patients were educated about ACS and recommendations for secondary prevention of ACS along with a standard dietary plan (DASH Diet) and exercise during hospital stay. Patients were also educated about the importance of adherence to drug therapy and lifestyle changes at the time of discharge. Patients were followed at 3 months, 6 months and 12 months after ACS.

Following parameters were recorded at each follow up

- Blood pressure and BMI (Body Mass Index).
- Lifestyle in relation to smoking habits, diet and physical activity was assessed.
- Information about drug compliance was collected from the patients.
- On follow up LDL and HbA1c (in diabetics) was recorded.

Statistical data analysis was done using SPSS version 23 for windows 10.

RESULTS

The study included a total of 260 patients of Acute Coronary Syndrome who were followed for a period of one year for assessment of lifestyle modifications and adherence to pharmacotherapy. Patients were followed at intervals of 3 months, 6 months and 12 months. The mean age±SD in the study patients was 55.6±8.27. This included 204 (78.5%) males and 56 (21.5%) females.

The various traditional risk factors at index event are shown in Table 1.

Table 1: Various risk factors in the study patients on admission.

Risk factor	Frequency (n)	Percentage (%)
Hypertension	176	67.7
Diabetes Mellitus	68	26.2
Smoking	166	63.8
BMI≥25	175	67.3
Family history of CVD	23	8.8

Sex distribution of various risk factors in the study is shown in Table 2. Female patients had higher incidence of hypertension and obesity than males.

Table 2: Demographic characteristics and traditional cardiovascular risk factors of the study population.

	Male	Female	p-value
Age (Mean±SD)	55.4±8.56	56.2±7.23	0.793
Smoking (%)	156 (76.4)	10 (17.9)	<0.001*
Hypertension, n %)	127 (62.3)	49 (87.5)	0.001*
Diabetes, n (%)	46 (22.5)	22 (39.3)	0.012*
BMI ≥ 25, n (%)	124 (60.8)	51 (91.1)	<0.001*
Family history of CVD, n (%)	19 (9.3)	4 (7.1)	0.612

Table 3: Medications at discharge in the study patients.

Medication	Frequency(n)	Percentage (%)
Antiplatelets	260	100
ACE-I	169	65.0
Statins	260	100
Beta blocker	236	90.8
Diuretics	25	9.6
ARB	39	15.0
Nitrates	4	1.5

ST elevation myocardial infarction (STEMI) was the most common admitting diagnosis followed by Non-ST elevation myocardial infarction (NSTEMI). Unstable angina was least common as shown in Figure 1.

All the patients received guideline directed medical therapy at time of discharge with an advice for adherence to the pharmacotherapy and guidance for life style modification as required. The various drugs prescribed at discharge are shown in table 3.

Follow up of patients showed that 30.12% of hypertensive patients continued to have uncontrolled hypertension at 3 months and the percentage continue to rise to 34.1% and 39.2% at 6 and 12 months respectively.
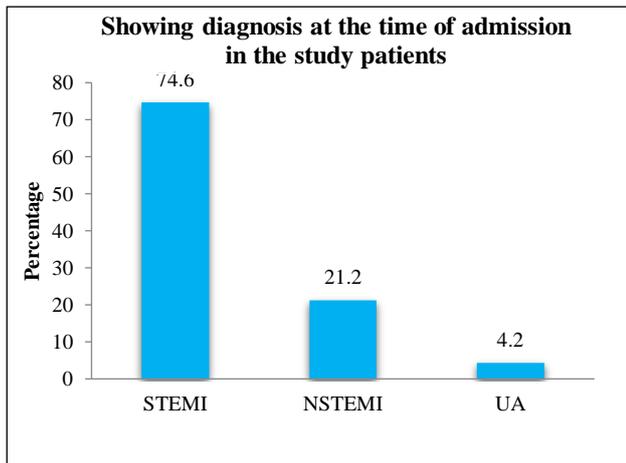
STEMI- ST Elevation myocardial infarction, NSTEMI- Non-ST-elevation myocardial infarction, UA- unstable angina

Figure 1: Diagnosison admission.

Only Insignificant number of diabetic patients achieved glycemic control with 67.7% of cases having HbA1c above the target level at 12 months. 10.10% patients at 3 months, 14.50% at 6 months and 16.90% at 12 months continued to smoke. Majority of patients continue have sedentary life style and maintained BMI in abnormal range as shown in Figure 2.
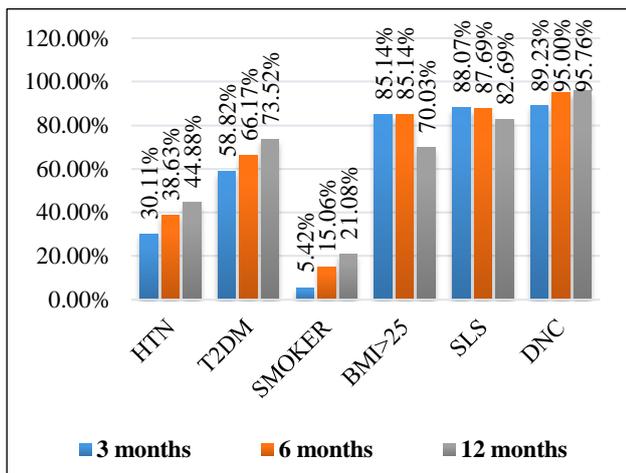
HTN-Hypertention, T2DM- Type 2 Diabetes Mellitus, BMI-Body mass index, DNC- Dietary Non-Compliance, SLS-Sedentary life style.

Figure 2: Risk factors at 3, 6 and 12 months of follow up.

Drug non-compliance was the major issue noted. The number of patients non–compliant to one or more essential drugs increased with time. Disparity was seen in the compliance with the type of drug also. Only 80.50% of patients on beta-blockers and 76.92% on statins were compliant to these drug intakes at 12 months of follow up. Over all 8.46%, 18.46% and 26.15% of cases were non-compliant to one or more drugs at 3,6 and 12 months of follow up respectively (Figure 3).
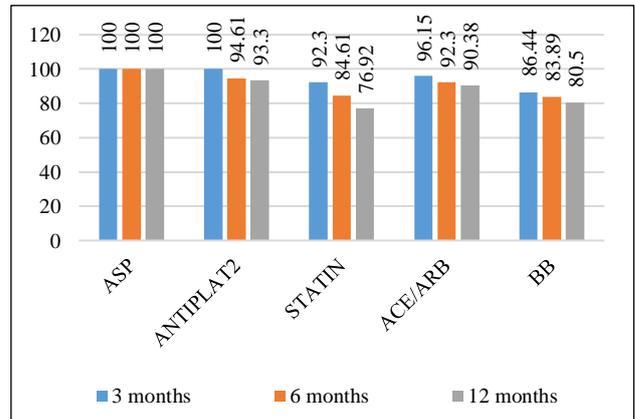
ASP- Asprin, ANTIPLAT2- Second antiplatlet, ACE/ARB-ACE Inhibitor/angiotensin receptor blocker, BB- Beta blocker

Figure 3: Percentage (%) of drug compliant patients on follow up.

At 3 months follow up LDL was less than 70 mg/dl in only 36% of cases. The count further decrease 19% and 21.5% on 6 and 12 months of follow up (Figure 4).
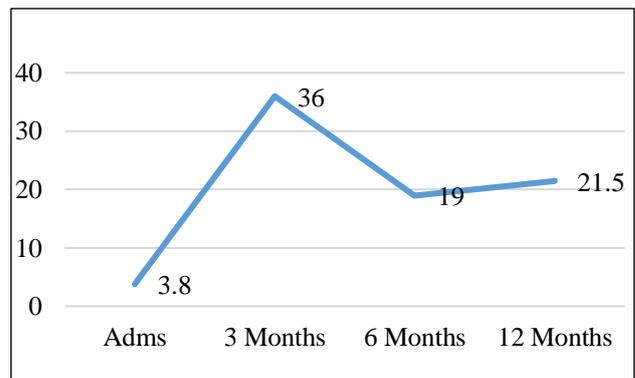
ADMS-admission

Figure 4: Percentage (%) of patients with LDL <70 mg/dl.

DISCUSSION

This study was conducted in the department of cardiology, SKIMS, Srinagar over a period of two years. In view of the scarcity of data about life style patterns and adherence to pharmacotherapy in developing world after an acute coronary event this study was taken up. This was the first study of its kind in our population.

The study included 260 consecutive patients who were followed for one year. The mean age of patients in this study was 55.6±8.27 years. Majority of patients were between the ages of 40 to 60 years. The mean age of the patients in our study was lower and majority of patients were younger than that in other studies.[12,13] This data was consistent with previous studies done in India which show that CAD presents a decade early in Indian patients.[14-18] This study revealed a strong male preponderance with male to female ratio of 4.64:1 consistent with other studies on coronary artery disease.[19-21]

Hypertension was the most common risk factor identified with 67.7% of patients having this risk factor on admission. Smoking was the second most common risk factor overall but there was significant gender difference in its prevalence with only 17.9% of female cases having this risk factor. This probably is due to higher prevalence of smoking in men than women in general population. Additionally the prevalence of smoking in our state is double the nation average as depicted by Global adult survey-2(GATS-2).[22-24] Diabetes was identified in 26.2% of cases as risk factor at index event. Obesity was seen as the most common risk factor in females. 91.1% of female patients were having body mass index ≥25 secondary to higher prevalence of sedentary life style in females.[19] Family history of coronary disease was seen in 8.8% of patients in this study.

ST elevation myocardial infarction was the most common type of ACS in the study. 76.4% of patients presented as STEMI, 21.2% as NSTEMI and 4.2% as unstable angina.

In accordance with the current guidelines 100% of the patients were put on dual antiplatelets and statins on discharge after an index event. 65% were discharged on ACE inhibitors, 15% on ARBs, 90.8% on beta blockers, 15% on diuretic and 4% on nitrates.

At 3 months of follow up 30.11% of patients had uncontrolled hypertension with blood pressure >140/90 mmHg. The number of patient with uncontrolled hypertension further increased to 38.63% and 44.88% at 6 and 12 months of follow up. Similar worsening trends on follow up were seen with patients of diabetes. 58.82% of patients had uncontrolled diabetes at 3 months with HbA1c levels above target of 7mg/dl which further deteriorated to 66.17% and 73.52% at 6 and 12 months respectively.

Similar results were seen in series of euroaspire studies. In the latest euroaspire IV, one of the largest studies conducted on primary and secondary prevention of coronary events in Europe, 42.8% patients had uncontrolled hypertension and 47% patients did not achieve target HbA1c levels at 6 months of follow up.[25]

Overweight and obesity with BMI ≥25 was seen in 85.14% of patients at 3 months with slight improvement to 70.03% at 12 months. It associated with marginal decrease in patients with sedentary life style. Patients usually resorted to sedentary life style after an index event for months despite clear medical advice.

There was a poor lipid control. Only 36% patient had LDL levels below 70mg/dl at 3 months follow up. This control further deteriorated to 19% at 6 months and 21.5% at 12 months. Lipid control was worse than seen in EUOASPIRE which recorded lipid control in nearly 40% patients at 6 months of follow up. This finding in our study may be due to higher dietary non-discretion and fall in statin intake with time in our study population.

Persistent Smoking, an important modifiable risk factor was seen in 5.42% of case at 3 months. More and more patients chose to restart smoking on follow up with 1/5 of patients smoking at 12 months of follow up. The major reasons for increasing smoking was sense of wellbeing, peer pressure and lack of community based program for de-addiction. The incidence of persistent smokers is higher than 5.4% at 6 months reported by Fresncesco Sofi et al, in their study.[26]

Drug compliance on follow up was another factor evaluated in this study. It was observed that compliance differed with different drugs. Patients maintained aspirin intake 100% throughout the follow up at 3, 6 and 12 months. Various factors contributed to its adherence in our patient population.

First the medication being very cheap and easily available even in the remotest part of the state and second the general notion in the patients that it is probably the only important medication after an acute coronary event. There was some drop in adherence to second antiplatelet intake on follow up. 94.61% and 93.3% patient were found to be taking second antiplatelet at 6 and 12 months of follow up respectively.

The non- adherence was higher with newer antiplatelets because of higher cost (for both ticagrelor and prasugrel) and side effects (for ticagrelor because of dyspnea). The drop in adherence was also noted with other medication too. There was drop in adherence to ACE/ARB intake by nearly 10% at 12 months. Beta-blocker adherence dropped by 20% at 12 months. The most significant non-adherence was seen with statins with time. There was steady rise in patients not taking statins with 23.08% patients non-adherent at 12 months. In similar studies by Tuppin P et al, and PURE study with prolonged follow up, non-adherence to evidence-based therapy (EBT) was noted.[27,28]

At 30 months follow up in the study by Tuppin P et al, 18.3% cases on antiplatelets, 32% patients on beta-blockers and 24% on statins were non-adherent to the respective drugs. In pure study the proportion of patients on secondary preventive drugs after a Coronary event was lowest in poor and middle income group countries.

Drug non-compliance after an acute coronary event has been proven to adversely effect the cardiovascular outcome. Additionally multiple studies study also reveal that adherence was related to 20% to 38% reduction in all-cause mortality and readmission rate at 30 months for statins, 15 to 21% for ACE/ARB and 15 to 16% for dual antiplatelets.[29]

CONCLUSION

This study reveals the widening gap in adherence to beneficial life style patterns and drug non-compliance with time in patients after an acute coronary event depriving them of mortality and morbidity benefits of these simple intervention. This also emphasis the need for new hospital and community based programs to increase the adherence to healthy life style patterns, better control of blood pressure, diabetes, cessation of smoking and adherence to the pharmacotherapy.

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