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Research Article

Assessment of Post-Myocardial Infarction Lipid Levels and Management

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ABSTRACT

Background: One of the major causes of death worldwide includes acute myocardial infarction (AMI) which is a type of heart attack. Whenever a person faces AMI, it becomes important for that person to carefully manage their cholesterol levels so that they can prevent any other heart problem or another heart attack. Therefore, it is necessary for heart patients to reduce their LDL-C levels (low-density lipoprotein cholesterol) because acute coronary events are caused due to high LDL-C. As recommended by 2021 European Society of Cardiology, LDL-C levels should be lowered by 50% after an event which means it should be below 1.4 mmol/L.

Objective: To assess the management of lipid profiles and lipid levels in patients after having myocardial infarction

Study design: A cross-sectional study

Duration and place of study: This study was conducted in Peoples University of Medical and Health Sciences for Women Shaheed Benazirabad Nawabshah from october 2023 to october 2024

Methodology: This is a cross-sectional study which was performed in the cardiology outpatient clinic of the hospital. This study included all the patients who had gone through their first acute coronary event in the last 3 years. All the participants of this study were aged at least 18 years and above. This research followed the 2021 ESC guidelines in order to prevent cardiovascular disease. Patients were advised to follow-up 6 weeks after their first visit. For cases where individuals couldn't tolerate statins or did not reach the recommended LDL-C levels, other lipid lowering medicines were added as suggested by the guidelines. T-tests and chi-square tests were conducted. SPSS version 21 was used.

Results: There were a total of 150 individuals who were a part of this study. Among these patients, the majority of them were males (70.6%). All the participants of this study were aged at least 18 years and above. The average age calculated was 57.1 years. The average time since the first acute coronary event was 36 months. The majority of the participants were on a recommended dose (n=132).

Conclusion: Although the majority of the participants were regularly following the statin treatment, achieving the target lipid levels is still a challenge.

INTRODUCTION

One of the major causes of death worldwide includes acute myocardial infarction (AMI) which is a type of heart attack [1]. Whenever a person faces AMI, it becomes important for that person to carefully manage their cholesterol levels so that they can prevent any other heart problem or another heart attack [2]. Therefore, it is necessary for heart patients to reduce their LDL-C levels (low-density lipoprotein cholesterol) because acute coronary events are caused due to high LDL-C [3]. People with heart problems do take strong medicines that control cholesterol with statins but still there is a chance of developing more heart issues [4]. Research says that 1 in 5 people surviving a heart attack are more likely to face another heart attack within 2 years of having the first one [5]. After that for the next 5 years, their

chances of dying rises from 19% to 22% due to heart problems [6].

After an acute coronary event, it is essential to check and manage one's lipid profile to avoid another event or any other heart problems. However, there are a number of individuals who do not focus on receiving proper treatment after such events. Research states that patients do not treat their dyslipidemia well which increases their risk of facing more heart problems in the future [7]. After a patient goes through acute coronary syndrome (ACS), high intensity statins are prescribed to them so that another event can be prevented [8]. However, many patients still do not receive proper treatment and do not reach the recommended cholesterol levels. Therefore, controlling hypercholesterolemia is necessary in these patients.

After a heart attack, different international guidelines offer different recommendations to control cholesterol by highlighting the need to assess every patient's risk. As recommended by 2021 European Society of Cardiology, LDL-C levels should be lowered by 50% after an event which means it should be below 1.4 mmol/L [9]. Moreover, lipid profiles should be tested after 4-6 weeks. Another guideline, ATP III guideline, recommends that LDL-C should be lowered to <70 mg/dL in ACS and <100 mg/dL in coronary artery disease (CAD) [10]. Furthermore, the National Institute for Health and Care Excellence recommends that HDL cholesterol should be reduced by 40% along with a follow-up after 3 months [11]. Although these targets are clear, many patients still do not reach recommended LDL-C levels.

In order to reduce the risk of heart problems in future, statins play a key role. However, in patients with a high risk of heart issues, statins alone may not be enough to reach the recommended cholesterol levels. In situations like these, statins are combined with other non-statin lipid-lowering medicines to achieve better results. Therefore, there is a need to carefully manage the cholesterol levels in heart patients after they face a heart attack. This study was conducted to assess the management of lipid profiles and lipid levels in patients after having myocardial infarction.

METHODOLOGY

This is a cross-sectional study which was performed in the cardiology outpatient clinic of the hospital. This study included all the patients who had gone through their first acute coronary event in the last 3 years. All the participants of this study were aged at least 18 years and above. This study was approved by the Ethical Review Committee of the hospital. Patients were informed in detail about this research and its purpose and their verbal consent was obtained.

This research followed the 2021 ESC guidelines in order to prevent cardiovascular disease. As recommended by 2021 ESC, LDL-C levels should be lowered by 50% after an event which means it should be <50 mg/dL. Patients were advised to follow-up 6 weeks after their first visit. For cases where individuals couldn't tolerate statins or did not reach the recommended LDL-C levels, other lipid lowering medicines were added as suggested by the guidelines. Data was recorded if the participants were using statins before their heart attack along with the type of statins they were prescribed after discharge.

High intensity statins were defined as atorvastatin ≥ 40 mg or rosuvastatin ≥ 20 mg daily. Lower doses than these were defined as moderate-intensity statins. Data was gathered which included the patient's medical history, type of heart attack, demographics, lipid profiles, and statin use pre and post-MI. T-tests and chi-square tests were conducted. SPSS version 21 was used.

RESULTS

There were a total of 150 individuals who were a part of this study. Among these patients, the majority of them were males (70.6%). All the participants of this study were aged at least 18 years and above. The average age calculated was 57.1 years. The average time since the first acute coronary event was 36 months. The majority of the participants were on a recommended dose (n=132). Table number 1 shows the demographic and clinical features of the participants.

Table No. 1

Features	Statin Treatment			
	Not on recommended dose (n=18)		On recommended dose (n=132)	
Gender				

• Male	12	66.7	93	70.5
• Female	6	33.3	39	29.5
BMI (kg/m2)				
• Below 18.5	0	0.0	1	0.7
• Between 18.5-22.9	15	83.3	10	7.7
• ≥ 23	3	16.7	121	91.6
Age (yrs)				
• ≤ 40	2	11.1	8	6.0
• 41 to 65	12	66.7	102	77.3
• > 65	4	22.2	22	16.7
Family history of coronary artery diseases				
• Yes	13	72.2	64	48.4
• No	5	27.8	68	51.6
Hospital admissions in last year				
• 0	13	72.2	115	87.1
• 1	2	11.1	14	10.6
• 2	3	16.7	3	2.3
Taking statins after 1st event of AMI				
• Yes	10	55.5	132	100.0
• No	8	44.5	0	0.0
Lipid profile advised after AMI				
• Yes	5	27.7	16	12.1
• No	13	72.3	116	87.9

Table number 2 shows the regression analysis for the clinical associates of the target total cholesterol.

Table No. 2

Features	**Multivariable**	**Univariate**
Gender		
• Male	1	1
• Female	1.43	1.07
BMI (kg/m2)		
• < 23	1	1
• > 23	0.75	0.76
Age (yrs)		
• ≤ 40	1	1
• 41 to 65	0.18	0.23
• > 65	0.18	0.27
Family history of coronary artery diseases		
• Yes	1	1
• No	0.94	1.03
Taking statins after 1st event of AMI		
• Yes	1	1
• No	0.52	0.71
Lipid profile advised after AMI		
• Yes	1	1
• No	0.58	0.62

Table number 3 shows regression analysis for the clinical associates of the target LDL-C.

Table No. 3

Features	Multivariable	Univariate
Gender		
● Male	1	1
● Female	1.09	1.18
BMI (kg/m2)		
● < 23	1	1
● > 23	0.34	0.57
Age (yrs)		
● ≤ 40	1	1
● 41 to 65	0.17	0.2
● > 65	0.14	0.18
Family history of coronary artery diseases		
● Yes	1	1
● No	1.42	1.39
Taking statins after 1st event of AMI		
● Yes	1	1
● No	1.45	1.04
Lipid profile advised after AMI		
● Yes	1	1
● No	0.15	0.27

DISCUSSION

The main cause of atherosclerosis is the buildup of cholesterol, especially LDL, inside the artery walls [12]. This leads to atherosclerotic cardiovascular disease (ASCVD). According to research studies, LDL and other apo-B which contain lipoproteins are essential in its development [13-15]. This research evaluates the management of lipid profiles in post-MI patients, focusing on the need for preventing heart problems in the future. This research included a total of 150 patients out of which only 14% were advised to get their lipid profile checked later. This is a very low rate because regular monitoring of lipid profiles is important in order to manage cardiovascular risk. There was a significant gap suggested in the findings in post-heart attack care.

Regardless of which statin is used, many clinical trials have shown that if LDL-C levels are lowered, there is a very low risk of cardiovascular disease [16]. However, there is no fixed limit of lowering the LDL-C levels. Even a little drop in LDL-C levels can provide a big advantage to the patients having very high risk of heart problems in the future. The main objective is to keep LDL-C within the target recommended [17]. Moreover, it is also important to see if the medication is affordable for the patient and how well the patient tolerates it. The recommended target for the individuals with cardiovascular disease is that the LDL-C levels should be lowered by 50% after an event which means it should be below 1.4 mmol/L [18,19].

In our study, the majority of the patients were recommended statin therapy including atorvastatin and rosuvastatin at specific doses. Moreover, the majority of the participants were regularly taking their prescribed statin therapy. Only 12% were the ones who reached the target LDL-C level. This states that even though the majority of their patients were regular with their treatment, most of them were not achieving the desired cholesterol levels. The reasons behind this may be genetic factors, lack of timely medication adjustments, or low statin doses. By analysing these findings, it is recommended to monitor lipid profiles regularly.

Our study also revealed that 14% of the participants had been hospitalized in the past year. Moreover, patients who did not follow their statin treatment were mostly readmitted. This shows that if the prescribed medicines are not taken seriously, it can lead to higher chances of ending up back in the hospital. Patients who were not compliant with the treatment were those who mostly faced repeated heart attacks. This highlights the need for consistency with the statin treatment. It is necessary to raise awareness about lipid profiles, start lipid testing early, and follow LDL-

C targets recommended by any guideline. Regular follow-ups and monitoring is also needed after a cardiovascular event [20].

CONCLUSION

Although the majority of the participants were regularly following the statin treatment, achieving the target lipid levels is still a challenge.

Funding Source

This study was conducted without receiving financial support from any external source.

Conflict in the Interest

The authors had no conflict related to the interest in the execution of this study.

Permission

Prior to initiating the study, approval from the ethical committee was obtained to ensure adherence to ethical standards and guidelines.

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