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Assessment of prescription pattern and impact of statin in lipid profile among ischemic heart disease patients

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Abstract:

BACKGROUND: Analysis of prescription patterns and lipid profiles can play a crucial role in rational drug use and patient safety. This study aimed to analyze the prescription pattern and impact of statin in lipid profile among ischemic heart disease (IHD) patients.

MATERIALS AND METHODS: A prospective observational study was conducted for 7 months in the cardiology department. IHD patients above 18 years and undergoing statin therapy for at least 3 months were enrolled. Patients with elevated liver enzymes and unfit for statin therapy, pregnant women, psychiatry patients, and critically ill subjects were excluded.

RESULTS: Of the total participants, 214 (71.8%) were males and 84 (28.2%) were females, with a mean age of 62.55 ± 9.56 years. The most common age group diagnosed with IHD was between 60 and 69 years. Hypertension was observed in 64.4% of the patients, while diabetes was present in 55.7% as the most commonly associated comorbidities. The majority of patients (75.8%) received atorvastatin. The prescription pattern for various drug classes included proton pump inhibitors (93%), antiplatelet agents (82.2%), statins (82.2%), nitrates (60.4%), beta-blockers (34.6%), diuretics (16.8%), biguanides (17.4%), and insulin (15.1%). After 3 months of statin therapy, a statistically significant change was observed in the lipid profile ($P < 0.001$).

CONCLUSION: Statin agents were the most frequently prescribed class of drugs, followed by antiplatelets. Significant improvements were observed in the lipid profile after a 3-month course of statin therapy. Effective therapeutic monitoring can significantly impact a positive health outcome in patients.

Keywords:

Atherosclerosis, coronary heart disease, dyslipidemia, prescription, statin

Introduction

Ischemic heart disease (IHD) occurs when the heart muscle does not receive enough oxygen and blood due to obstructions in the arteries.[1] According to the Global Burden of Disease 2019 study, the overall number of deaths from IHD approached 9.14 million in 2019, constituting 49.2% of cardiovascular disease (CVD)-related deaths. Aside from life measurements like disability-adjusted life years (DALYs), IHD significantly impacts productive life years. Researchers anticipated that by 2030, 8,100 adults aged 45–64 years would be out of work in Australia due to IHD, with a 35% rise in government welfare payments.[2]

IHD stands as a prominent factor contributing to morbidity and mortality rates (particularly premature mortality) in developing nations such as India. Over the past six decades, studies conducted in India have documented a rise in the prevalence of IHD among urban populations compared to rural, which is increasing from 1% to approximately 9–10%.[3,4] While the

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age-standardized mortality rates for IHD have shown a decline in recent decades, there has been a notable surge in the global burden of IHD in terms of the absolute number of DALYs. In India, between 1990 and 2010, the burden of IHD increased by 29%, reaching a staggering 129 million DALYs.[5]

Serum cholesterol and lipoprotein carriers, such as low-density lipoprotein (LDL), very low-density lipoprotein (VLDL), and high-density lipoprotein (HDL), have been associated with the development of atherosclerosis. Certain risk factors contribute to the development of IHD. Controllable risk factors include smoking, obesity, diabetes, stress, sedentary lifestyles, high cholesterol levels, depression, hypertension, and anxiety. Uncontrollable risk factors include age, gender, and heredity. It is important to identify and manage these risk factors to reduce the occurrence of IHD and have a key role in monitoring statin therapy efficacy.[6]

Statin medications have been proven to be effective in the reduction of cholesterol levels and the risk of IHD.[7] Recent study reports suggested that lowering LDL cholesterol (LDL-C) is a key approach to treating and preventing IHD, although the ideal level is still unknown.[8] Statin use and dosage have increased over time, and the reduction in LDL-C has been associated with a significant decrease in the risk of major cardiovascular events.[9] Multiple drug therapy is often required to manage CVDs, considering the complexity and presence of concomitant conditions. However, the use of multiple medications can affect patient compliance and therapeutic outcomes. Fixed-dose combinations (FDCs) of medications are encouraged when appropriate, as they simplify treatment regimens and improve adherence.[10] Prescribing patterns may be influenced by factors such as gender, age, educational qualification, experience, and speciality of the health-care provider.[11]

Using multiple medications, polypharmacy can lead to inappropriate drug utilization, lower treatment adherence, potential drug–drug interactions, and an increased likelihood of adverse events. It is essential to evaluate prescription patterns and drug utilization regularly to ensure the safety and effectiveness of prescribed medications. Prescription pattern studies can help identify appropriate changes in prescribing practices and optimize treatment for IHD patients.[12]

Assessing the lipid profile of IHD patients and analyzing prescription patterns are essential in tailoring appropriate medications, dosages, and treatment durations. Prescription patterns impact individual patient care and have broader social implications.[13] It is crucial to avoid prescribing errors, dispensing errors, administration errors, and irrational medications, as this poses significant global concerns. Evaluating drug utilization patterns and optimizing medication regimens can minimize adverse events and improve patient outcomes.[14]

Identifying and managing risk factors, like lipid profiles (HDL, LDL, VLDL, triglycerides (TG), cholesterol), is crucial in preventing and treating IHD. The adult treatment panel III has recommended LFT monitoring (therapeutic effectiveness of statin) after 12 weeks of statin therapy.[7] Careful evaluation of prescription patterns is essential to ensure safe and effective treatment for IHD patients, ultimately leading to better health outcomes. Prescription pattern studies primarily examine the prescribing, dispensing, and administration of drugs. These studies aim to encourage the appropriate utilization of monitored drugs while concurrently reducing instances of irrational medication use and preventing the unnecessary economic burden to the patients. The purpose of conducting this study was to analyze the prescription pattern and impact of statin in lipid profile among IHD patients.

Materials and Methods

Study design and setting

This study was a prospective observational study. This study was carried out for 7 months (November 2022–May 2023) at the department of cardiology, tertiary care teaching hospital, Mangaluru, Dakshina Kannada, India.

Study participants and sampling

This study included patients aged ≥18 years of either gender, diagnosed with IHD, and on statin medication for at least 3 months. Patients with abnormally elevated liver enzymes, patients unfit for statin therapy, pregnant women, critically ill patients, participants unwilling to participate, and psychiatry patients were excluded from the study.

This study implemented a convenience sampling method. The sample size for this study was determined based on the study by Khanal *et al*., study taking the prevalence of atorvastatin 73.7% at 95% confidence interval and 5% expected precision (d).[15] The required minimum sample size of this study was found to be 298 IHD patients. This sample size was calculated using the following formula:

$$n = \frac{Z^2_{1-\alpha/2} pq}{d^2}$$

where $Z^2_{1-\alpha/2}$ = 1.96, expected proportion (p) = 0.737, expected precision (d) = 0.05, and $q = 1 - p$.

Ethical consideration

Before conducting the study, we have obtained ethical approval from the institutional ethics committee (ref. no: NGSMIPS/IEC/010/2022) and also registered in the clinical trial registry of India (CTRI/2022/11/047269). Patient participation in the study was voluntary, and written informed consent was taken before enrollment.

Data collection tool and technique

The study utilized various data sources, including participant medical records, treatment charts, and laboratory data. The materials used for data collection included a self-designated participant data collection form, an informed consent form, and a participant information sheet. Two pharmacists prepared the draft copy of the data collection form, which was later validated by one academic pharmacist, general medicine physician, and cardiologist. A pharmacist performed the patients' enrollment and data collection process. Throughout the study, any confusion or doubt was resolved concerning the treating physician. We have captured demographic details from the developed data collection form, such as age, gender, and social habits (smoking and alcohol).

Additionally, laboratory values such as TG, HDL, total cholesterol, and VLDL were recorded at baseline and 3 months after statin therapy. Disease-related information, risk factors, and treatment-related details such as medication classes, number of medications per prescription, and dose were also collected. Data were obtained through direct interviews with participants and medical records.

Statistical analysis

Statistical analysis was conducted using a statistical package for the social sciences version 20. Descriptive analysis was used to express quantitative data, while qualitative data were presented in terms of frequency and percentage. The comparison between pre- and post-lipid profiles was performed using a paired *t*-test. The Mann–Whitney *U* test and one-way analysis of variance were employed to determine significant differences between the two groups.

Multiple regressions were applied using the overall lipid profile levels as the dependent variables. The predictor variables were age, gender, BMI, family history, social habits, and comorbidities, whereas log transformation was used to convert VLDL and TG data into normally distributed data.

Results

A total of 298 IHD patients were included in the study, of which 214 were men and 84 were women. The mean age of the overall population was found to be 62.5 ± 9.5 years. Most of the population was within the normal category of BMI (70.5%, *n* = 210). Only 7% (*n* = 21) of the patients had a family history of IHD. The most prevalent comorbidity among the patients was hypertension (64. 4%, *n* = 192). The details are summarized in Table 1. The major modifiable risk factor was hypertension (64.4%, *n* = 192) and diabetes (55.7%, *n* = 166), whereas nonmodifiable risk factors were age 50 years and above (90.6%, *n* = 270) and family history (7%, *n* = 21). The details are summarized in Table 2.

On prescription analysis, 100% (*n* = 298) patients had received at least one statin. The majority of the patients were prescribed cardiovascular drugs like aspirin 80.2% (*n* = 239), atorvastatin 75.8% (*n* = 226), and clopidogrel 68.1% (*n* = 203). The least number of patients were prescribed fenofibrate 3% (*n* = 9), bisoprolol 2% (*n* = 6), and amiodarone 1.3% (*n* = 4). All patients were prescribed statin [82.2% (*n* = 245): statin monotherapy and 17.8% (*n* = 53) statin FDC] followed by proton pump inhibitors 93% (*n* = 277) and antiplatelet agents 82.2% (*n* = 245). Other commonly prescribed drugs were nitrates 60.4% (*n* = 180), laxatives 70.1% (*n* = 209), and beta-blockers 34.6% (*n* = 103). The least prescribed drugs were antiarrhythmic agents 1.3% (*n* = 4). Based on the number of drugs

Table 1: Demographic details

Category	Number of patients (*n*=298)	Percentage (%)
Age in years		
40–49	28	9.1
50–59	78	26.5
60–69	125	41.9
70–79	54	18.1
≥80	13	4.4
Gender		
Male	214	71.8
Female	84	28.2
BMI		
Underweight <18.5 kg/m^2	3	1
Normal (18.5–24.9 kg/m^2)	210	70.5
Overweight (25–9.9 kg/m^2)	82	27.5
Obesity (>30 kg/m^2)	3	1
Family history of IHD	21	7
Social habits		
Alcohol	57	19.1
Tobacco	43	14.4
Tobacco and alcohol	31	10.4
Comorbidities		
Diabetes	166	55.7
Hypertension	192	64.4
COPD	20	6.7
Dyslipidemia	19	6.4
Hypothyroidism	13	4.4

BMI=Body mass index, IHD=ischemic heart disease, COPD=chronic obstructive pulmonary disease

prescribed, the maximum number of patients were prescribed 8 drugs, which is 25.1% (n = 75), whereas only 1 patient was prescribed 13 drugs. Tables 3 and 4 and Figures 1 and 2 show a detailed drug utilization pattern summary. The impact of statin therapy on lipid profile was found to be statistically significant. The details are summarized in Table 5, Table 6, and Figure 3.

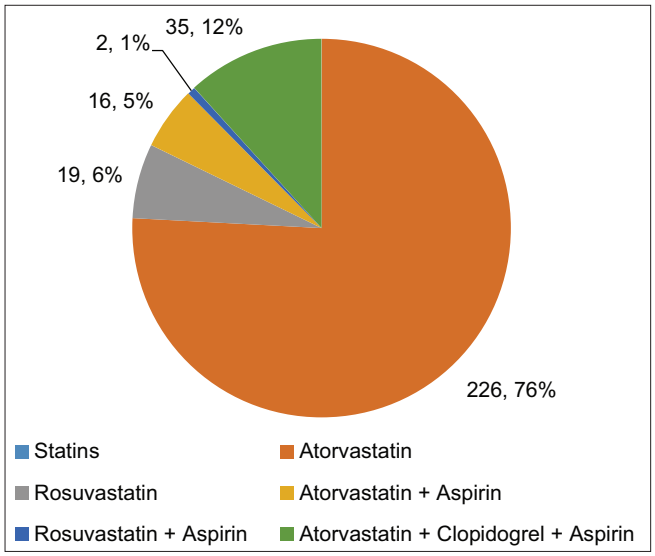

Figure 1: Pattern of statin use among the patients

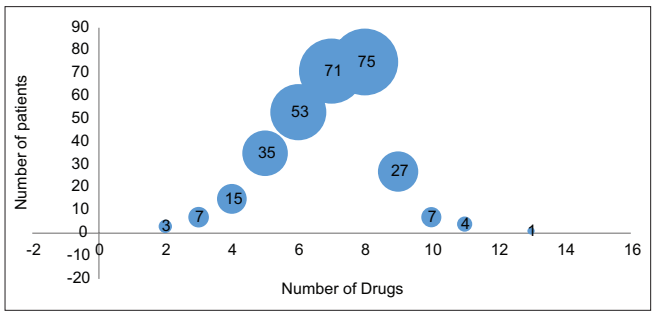

Figure 2: Number of drugs prescribed among patients

The outcomes of multiple linear regression illustrate that none of the included predictor variables forecast the change in post-statin therapy. This indicates that statin therapy is the only factor for improving lipid profile among the study patients [Table 6].

Discussion

This prospective observational study was carried out in South India in order to investigate the lipid profile of IHD patients before and after statin medication. At the same time, we have analyzed the drug utilization pattern in IHD patients. Several studies indicate that the lipid profile plays a substantial part in an individual's development of CVDs such as IHD. Increased TG and cholesterol levels in the body may contribute to the formation of atherosclerosis and rigidity in the blood vessels and eventually lead to the obstruction or narrowing of the blood vessels, which are key risk factors for the induction of IHD. Thus, monitoring the lipid profile in IHD patients is critical for early identification of the therapeutic efficacy of cholesterol-lowering medications such as statin. Furthermore, this study analyzed the critical

Table 2: Distribution based on risk factors

Risk factors	Number of patients (n=298)	Percentage (%)
Modifiable risk factors		
Hypertension	192	64.4
Diabetes	166	55.7
Dyslipidemia	19	6.4
Obesity	3	1
Alcohol	89	29.9
Tobacco	78	26.2
No risk factors	3	1
Nonmodifiable risk factors		
Age (≥50 years)	270	93.4
Family history of IHD	21	7

IHD=Ischemic heart disease

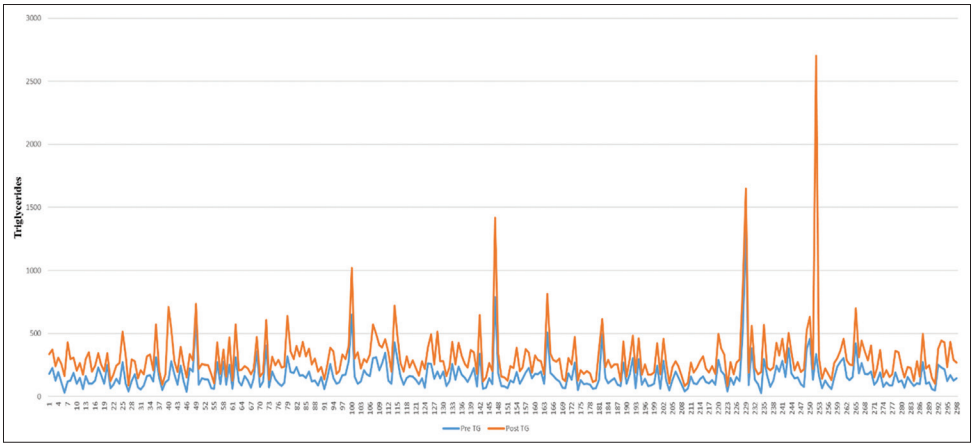

Figure 3: Comparison of triglycerides before and after statin therapy

Table 3: Drugs utilization pattern

Drug category	Number of patients (*n*=298)	Percentage (%)
Monotherapy		
Aspirin	239	80.2
Clopidogrel	203	68.1
Ticagrelor	38	12.8
Isosorbide mononitrates	168	56.4
Nitroglycerine	12	4
Pantoprazole	277	93
Ivabradine	29	9.7
Metformin	52	17.4
Metoprolol	97	32.6
Bisoprolol	6	2
Insulin	45	15.1
Amlodipine	69	23.2
Torsemide	50	23.2
Alprazolam	49	16.4
Fenofibrate	9	3
Thyroxine	13	4.4
Ranolazine	17	5.7
Amiodarone	4	1.3
Ramipril	47	15.8
Fixed-dose combination		
Liquid paraffin + magnesium hydroxide + sodium picosulfate	209	70.1
Metformin + glimepiride	82	27.5
Budesonide + formoterol	20	6.7

Table 4: Drugs utilization pattern based on class

Drug category	Number of patients (*n*=298)	Percentage (%)
Drug class: Monotherapy		
Antiplatelets	245	82.2
Statins	245	82.2
Nitrates	180	60.4
Proton pump inhibitor	277	93
HCN channel blockers	29	9.7
Biguanides	52	17.4
Beta-blocker	103	34.6
Insulin	45	15.1
Calcium channel blocker	69	23.2
Diuretics	50	16.8
Benzodiazepines	49	16.4
Fibrates	9	3
Thyroid hormone	13	4.4
Antianginal	17	5.7
Antiarrhythmic	4	1.3
ACE inhibitor	47	15.8
Fixed-dose combination		
Statin+antiplatelet	53	17.8
Laxatives	209	70.1
Biguanides+sulphonyl urea	82	27.5
LABA+corticosteroids	20	6.7
Mean±SD	6.9±1.7	

HCN=Hyperpolarization-activated, ACE=angiotensin-converting enzyme, LABA=long-acting beta-agonist

role in monitoring the individual's medical condition, prognosis, and progression.[16,17]

This study involved 298 patients, and it was observed that a higher proportion of males (71.8%) were affected by IHD compared to females (28.2%). Corresponding IHD burdens were reported by Martin *et al*., from a US study, where 68.7% of males had IHD outnumbered females (30.3%),[18] whereas a Chinese study conducted by Li and Zhang observed males were having higher IHD burden than females.[1] The reasons for a more significant disease burden of IHD in men than in women may be due to men's heavy social responsibilities and high mental/psychological pressure, which predisposes them to develop unhealthy lifestyle habits such as staying up late, smoking, excessive drinking, and eating a high-fat diet. Men are less likely than women to overlook health problems and delay seeking medical help. Furthermore, estrogen's preventive action in women can prevent diabetes, protect blood vessels, and delay atherosclerosis; however, the degree of the protective effect requires additional data.[19]

This study shows that 41.9% of the population belonged to the age group of 60–69 years, while the lowest representation was observed in the 80–89 age group. These findings correspond with a study conducted in Malaysia by Haque *et al*., where 35% of the subjects fell within the 60–69 age group, whereas they observed fewer participants from the 30–39 age group.[20] Based on BMI, the current study observed that most individuals (70.5%, n = 210) fell under the normal weight category, while 27.5% are classified as overweight and 1% as obese. A similar pattern was observed in a retrospective study conducted by Qiu *et al*., in China, where the majority of patients (50.8%, n = 265) belonged to the normal weight category and 34% (n = 169) under the overweight category.[21] Present study results were contrast with study reports of the United States, where the majority of patients (44.1%, n = 6,669) were overweight and 35.3% (n = 4,667) were obese.[18]

Upon assessing the social habits of the patients, it was found that 19.1% of them had a social habit of consuming alcohol, while 14.4% had a social habit of using tobacco. A similar pattern of social habits was observed in a Tibetan study conducted by Sherpa *et al*., where they reported a prevalence of 24.2% for tobacco and 44.2% for alcohol consumers.[22] In our study, hypertension (64.4%) and diabetes (55.7%) were found to be commonly occurring comorbidities. These results align with a Malaysian cross-sectional study that reported that 54% of the subjects had hypertension and 57% were diagnosed with diabetes, indicating a similar prevalence.[20]

In this study, range of drugs prescribed was 2–13, and the maximum number of patients (25.1%) were prescribed 8

Table 5: Impact of statin therapy on lipid profile

Lipid profile	Baseline	After 3 months	*P*
HDL (mean±SD)	39.21±10.20	43.77±19.61	<0.001*
LDL (mean±SD)	124.82±47.46	86.29±35.23	<0.001*
Total cholesterol (mean±SD)	189.37±87.96	143.15±38.09	<0.001*
VLDL median (Q1, Q3)	27.2 (19.67, 39.60)	22.11 (16.55, 30.60)	<0.001*
Triglycerides median (Q1, Q3)	141 (100, 196.25)	115.5 (88, 166)	<0.001*

*<0.001: Highly statistically significant. SD=Standard deviation, Q1=quartile 1, Q3=quartile 3, HDL=high-density lipoprotein, LDL=low-density lipoprotein, VLDL=very low-density lipoprotein

drugs. More than 90% of the patients were encountered with polypharmacy, that is, prescribed five or more medications. This is comparable to an Indian study conducted by Sawant *et al*., in which IHD patients were prescribed a range from 4 to 14 drugs, and most of them were using 8 drugs per day,[23] whereas these findings are unlikely with Shuhaili *et al*., study reports among Asian IHD patients.[24] The increase in number of concomitant drugs may increase the scope of drug interactions and can lead to adverse therapeutic outcomes.

Among the patients enrolled in the study, several modifiable risk factors for IHD were observed, including hypertension (64.4%), diabetes (55.7%), alcohol consumption (29.9%), smoking (26.2%), dyslipidemia (6.4%), and obesity (1%). These findings are consistent with a study conducted by Gupta *et al*., in North India among cardiovascular patients who highlighted smoking, diabetes, hypertension, and dyslipidemia as the primary risk factors associated with IHD heart disease.[25]

In this study, all the patients were prescribed a statin, out of which 82.2% were prescribed statin monotherapy and 17.8% were prescribed FDC therapy. Comparable results were obtained by an Indian study in which 70.37% were prescribed single drugs statin and 1.24% were prescribed FDC of statin.[26] In the case of monotherapy in the current study, most commonly prescribed drugs were pantoprazole (93%), followed by aspirin (80.2%), atorvastatin (76.5%), and clopidogrel (68.1%). This pattern of prescription is similar to an Indian study among IHD patients study carried out by Sawant *et al.*, in that they observed that most frequently prescribed drug was pantoprazole (82.1%), followed by clopidogrel (86.3%) and atorvastatin (82.5%)[23] FDC is more effective than the use of higher doses of monotherapy which is practised in our study in which FDCs are given. Pantoprazole was mainly prescribed in the above study to counteract the gastric complication due to antiplatelet medicines like aspirin and clopidogrel.[27]

In the current study, the most frequently used antihypertensives were beta-blockers (34.6%) and calcium channel blockers (23.2%), which is found comparable with the reports of an Indian study carried out by Dawalji *et al.*, which identified beta-blockers (59.41%), and calcium channel blockers (21.18%) as the most frequently prescribed.[26]. Antihypertensive medicines were most regularly recommended in this study, possibly because hypertension was the most common concomitant disease.[28]

A notable disparity was observed in the lipid profile before and after 3 months of statin therapy, indicating a significant impact on controlling the lipid profile. The average reduction in total cholesterol, TG, LDL, and VLDL levels was 86.29%, 143.15%, 22.11%, and 115.5%, respectively. These findings correspond with a North Indian study conducted by Khanal *et al.*, where they reported a mean decrease of 17.24% in total cholesterol, 21.24% in TG, 33.19% in LDL, and 22.83% in VLDL.[15] When examining the lipid profile in relation to age, gender, and BMI, no statistically significant differences were identified. Sherpa *et al.*, conducted a study that observed a mean decrease in total cholesterol, TG, LDL, and VLDL levels when comparing these factors.[22]

High TG levels are considered markers for the various types of lipoproteins. The patients observed with hypertriglyceridemia are at a significant risk for CVD. Even though LDL-C levels were at goal, high TG is the indicator for CVD. TG also increases the risk of CAD by increasing the LDL level and demining the good lipoprotein HDL level. Additionally, it disrupts the artery walls and activates the clotting factors.[29,30]

Statins are drugs that lower LDL-C levels in bloodstreams by selectively inhibiting the hydroxy methyl glutaryl-coenzyme A (HMG-CoA) reductase enzyme in the liver, which is the rate-limiting enzyme in the cholesterol synthesis pathway. As an outcome, HMG-CoA conversion to mevalonate is prevented, resulting in cholesterol synthesis. As a result of this reduction, a transcription factor known as sterol regulatory element-binding protein is activated and transferred from the endoplasmic reticulum into the Golgi apparatus. LDL receptor transcription will be triggered, resulting in an increase in the number of LDL receptors. As a result, LDL-C uptake increases, lowering plasma LDL-C levels. Although statins have a shared mechanism of action, their relative efficacy in changing the lipid profile varies. So, the effective use of satins can play an essential therapeutic role in IHD patients.[24]

Table 6: Predictors of change in lipid profile after statin therapy

Predictors	Unstandardized coefficients		*t*	*P*	Tolerance	Adjusted R^2
	B	Std. error				
High-density lipoprotein						
Constant	31.3248	15.270	2.05133			−0.0137
Age	0.0169	0.123	0.13825	0.890	0.984	
Gender	2.3233	3.086	0.75289	0.452	0.824	
Normal BMI	9.5208	11.615	0.81969	0.413	0.993	
Overweight BMI	7.9721	11.763	0.67772	0.498		
Obesity BMI	4.1260	16.285	0.25337	0.800		
Social habits	4.2541	2.780	1.53018	0.127	0.828	
Family history	−2.1557	4.542	−0.47467	0.635	0.984	
Comorbidities	0.0453	7.131	0.00636	0.995	0.993	
Low-density lipoprotein						
Constant	95.670	27.134	3.526			0.00804
Age	−0.565	0.218	−2.596	0.010	0.984	
Gender	6.484	5.483	1.182	0.238	0.824	
Normal BMI	15.088	20.639	0.731	0.465	0.993	
Overweight BMI	14.884	20.902	0.712	0.477		
Obesity BMI	−7.448	28.936	−0.257	0.797		
Social habits	3.726	4.940	0.754	0.451	0.828	
Family history	−10.718	8.070	−1.328	0.185	0.984	
Comorbidities	8.828	12.670	0.697	0.486	0.993	
Very low-density lipoprotein						
Constant	6.4320	0.99826	0.99826			−0.00177
Age	−0.0150	0.00801	0.00801	0.063	0.984	
Gender	0.0755	0.20173	0.374	0.708	0.824	
Normal BMI	−0.9683	0.75931	−1.275	0.203	0.993	
Overweight BMI	−1.0177	0.76898	−1.323	0.187		
Obesity BMI	−1.5981	1.06456	−1.501	0.134		
Social habits	0.1959	0.18174	1.078	0.282	0.828	
Family history	−0.3333	0.29689	−1.123	0.263	0.984	
Co-morbidities	0.3121	0.46614	0.670	0.504	0.993	
Triglycerides						
Constant	15.93612	2.6849	5.93539			0.00284
Age	−0.04489	0.0215	−2.08313	0.038	0.984	
Gender	−0.03411	0.5426	−0.06287	0.950	0.824	
Normal BMI	−2.05340	2.0422	−1.00546	0.316	0.993	
Overweight BMI	−1.76577	2.0683	−0.85375	0.394		
Obesity BMI	−3.39082	2.8632	−1.18426	0.237		
Social habits	0.60933	0.4888	1.24654	0.214	0.828	
Family history	−0.86549	0.7985	−1.08386	0.279	0.984	
Comorbidities	−0.00665	1.2537	−0.00530	0.996	0.993	
Total cholesterol						
Constant	158.287	29.237	5.4139			0.0146
Age	−0.612	0.235	−2.6076	0.010	0.984	
Gender	10.225	5.908	1.7305	0.085	0.824	
Normal BMI	19.818	22.239	0.8911	0.374	0.993	
Overweight BMI	21.156	22.522	0.9393	0.348		
Obesity BMI	−3.631	31.179	−0.1165	0.907		
Social habits	3.908	5.323	0.7341	0.463	0.828	
Family history	−13.019	8.695	−1.4972	0.135	0.984	
Comorbidities	−0.332	13.652	−0.0243	0.981	0.993	

BMI=Body mass index, *B*=Beta-coefficient

Strength, limitation, and recommendation

Strength: The impact of pre- and post-station therapy on the lipid profile was investigated in this study. By analyzing the prescription pattern and its impact on the lipid profile, the healthcare practitioner can gain insight into the therapy's success in regulating

the lipid profile. This research may play an essential role in using evidence-based medications in IHD patients. *Limitations*: It would be preferable if we could do comparative multicenter research where we can compare and contrast two groups. Further study can be carried out by considering crucial factors like comparison of the lipid profile based on the cholesterol-lowering drugs, medication adherence, and duration of statin therapy.

Conclusion

The study examined the prescribing patterns and lipid profiles of patients with IHD. The study included 298 IHD patients with an average age of 62.55 ± 9.56 years, mostly male. All the patients were prescribed at least one satin drug, followed by the proton pump inhibitor (93%) and antiplatelet agents (82.2%). Most patients (75.8%) were prescribed atorvastatin, while a smaller proportion (6.4%) received rosuvastatin. After a 3 months course of statin therapy, there was a statistically significant improvement in the lipid profiles of the patients ($P < 0.001$).

The findings of this study provide valuable insights to healthcare professionals regarding the importance of statins in managing IHD and their effectiveness in lowering lipid profiles. The study also focused on the prescription patterns observed in treating IHD. It highlights the significance of comprehensive counseling on dietary and lifestyle modifications alongside medication. Moreover, ensuring proper adherence to lipid-lowering drugs necessitates regular follow-up appointments, particularly during the initial stages of therapy and at appropriate intervals.

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Conflicts of interest

There are no conflicts of interest.

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