



A PROSPECTIVE OBSERVATIONAL STUDY TO ASSESS ANTI-HYPERLIPIDEMIC THERAPY IN PATIENTS WITH CARDIOVASCULAR DISEASE IN A TERTIARY CARE TEACHING HOSPITAL**PATEL P, GOHIL K, PATIL D, DIKKATWAR MS AND RATHOD MM***

Department of Pharmacy Practice, Parul Institute of Pharmacy, Parul University, Vadodara, 391760, Dist. Vadodara Gujarat, India.

***Corresponding Author: Parth Patel: E Mail: pjpatel98@gmail.com**Received 8th Jan 2022; Revised 9th Feb. 2022; Accepted 7th March 2022; Available online 1st May 2022**ABSTRACT**

In a tertiary care hospital, a total of 150 prescriptions were analysed. Majority of the patients were found to be in the age group between 51-60 year (39.33%). Male patients were more (67.3%) than female patients (32.66%). Most of patients were diagnosed with ACS (34.66%) followed by stroke (28%) and other disease (18.66%) and CKD+HTN+DM (13.33%) and HTN (5.33%). Out of 47 patients diagnosed with co-morbidities, most of the patients were found to have other co-morbidities (44.68%) followed by HTN+DM (38.29%). The results showed that among various statins, Atorvastatin 66% was the most commonly prescribed drug than Rosuvastatin 14% whereas combination therapy atorvastatin with aspirin was the most common drugs prescribed as combination therapy.

Keywords: Statins, Anti-Hyperlipidemic drugs, Cardiovascular diseases**INTRODUCTION**

Cardiovascular diseases have caused almost 20 million deaths per year globally and a similar number of non-fatal cardiovascular events. According to WHO cardiovascular diseases are now considered as the number 1

cause of death globally with a increasing rate of 17.9 million deaths each year [1]. People with this cardiovascular events and also the people who are at high cardiovascular risk (due to the presence of one or more risk

factors such as hypertension, diabetes, and hyperlipidemia) need early detection and management using patient counselling and medicines, as appropriate [1]. People with lower and median income countries who suffer from CVDs and other various non-communicable diseases have very less accessibility to effective and reasonable health care services which respond according to their needs. As a result, many people with lower and median income countries are facing problem in detecting the course of the disease and die younger from cardiovascular disorders and other various non-communicable diseases, usually in their most productive years [2]. Even though CVD may directly arise from different etiologies such as thrombus, emboli in a patient with atrial fibrillation resulting in ischemic stroke, coronary artery disease and atherosclerosis which is the most common denominator when seen in case of pathophysiology of CVD. Particularly, physical inactivity, intake of high calorie diet, high refined sugar are associated in development of CVD and other metabolic disturbances like metabolic syndrome, DM, HTN that are having the highest prevalence rates in patients with CVD [3] [4].

Anti-hyperlipidemic drug use and classification

Hydroxymethyl glutaryl co-enzyme A reductase (HMGCoA) inhibitors, generally called as statins are one of the most frequently prescribed medications in Asiatic regions. Statins are the utmost effective drugs that decrease LDL cholesterol [19]. Statins are the first line agents for hyperlipidemia due to their safety and efficacy [20]. Statin⁸ reduces the endogenous cholesterol biosynthesis by inhibiting the HMG-CoA reductase enzyme which is a rate limiting enzyme integral to the mevalonate pathway. There is also a corresponding reduction in hepatic cholesterol synthesis that initiate translocation of membrane-binded sterol regulatory element- binding proteins to the nucleus, subsequent upward regulation of LDL receptors on the surface of hepatocytes, which ultimately leads to elevated clearance of LDL cholesterol levels from the blood. These effects make statins effective for treating hypercholesterolemia.

Role of pharmacist in prevention of cardiovascular diseases

Pharmacists can provide initial risk assessments for risk factors and offer interventions such as weight management and smoking cessation programs. Pharmacists can offer services to optimize medicines for patients and reinforce adherence such as Medicine. Community

pharmacists serve as drug experts providing pharmacological advice, and limited patient care for minor conditions in their community pharmacies. In many countries, community pharmacies are places where individuals may obtain health advice and assistance for managing their disease status with medication. Pharmacist plays an active role in promoting the rational use of medicines, pharmaco-surveillance, health education, disease detection, and in providing medication related information to both doctors and patients. Community pharmacy-based interventions have resulted in reduction in risk behaviours and risk factors for coronary heart disease (CHD). Studies have demonstrated their role in improving surrogate outcomes for patients with cardiovascular disease by

METHODOLOGY

The study has been conducted in Parul Sevashram, a 750-bed tertiary care teaching Hospital. After taking prior consent from patients, the data has been collected from all medical notes, including progress charts, nursing documents, consultations sheets, discharge files, vital signs charts, laboratory investigations reports, and pathologic data. The Institutional Ethics Committee on Human Research – Parul University (PU-IECHR) authorized the protocol

(PUIECHR/PIMSR/00/081734/3009), and whole research was conducted at Parul Sevasharm Hospital.

Identification of subjects

We looked for patients of either gender and patients with the age group of >30 years and <80 years were included in the study. Subtleties of significant clinical history, diagnosis, brand name, conventional name and dosage of statins and statin consolidated arrangements were acquired from the case records, treatment charts and remedies. The data from 150 patients were examined in total.

Sources of data collection

We gathered information such as demographics, vital signs, and laboratory results, along with predisposing conditions, primary complaints, and previous medication history. Temperature, red blood cell, palpitations, white blood cell and platelet counts were all measured on the same day.

To check the etiology of elevated cholesterol levels in patient, we looked at discharge instructions and lipid profile tests, including regular progress comments.

Percentage variation in cost =

$$\frac{\text{Cost of the prescribed drug} - \text{Cost of the suggested drug}}{\text{The least costly brand's price}}$$

Statistical analysis

Data was gathered on Microsoft Excel (2013) worksheets and altered for fulfillment. Descriptive statistics (frequency, percentage) was used, tables were used as appropriate.

RESULTS

Demographic Characteristics of Patients

The research study demonstrates the wide price discrepancy between the various brands of statins available to treat patients. In our study, a total of 150 patients were selected as per the inclusion criteria during the study period. Table I gives information about the demographic and clinical characteristics of patient where majority of patients were found in age group 51-60(39%) with majority of males(68%) when compared to

females(32%). As the table depicts that almost 56% of individuals had a hospital stay of 6-10 days as per the cardiovascular disease condition.

Out of 150 individuals, we found that about 89(59%) patients were found to be overweight, followed by 32(21%) who were Obese and rest of the patients were having normal weight. During the study, Acute coronary syndrome condition was developed in 52 (35%) patients, followed by stroke patients (28%), CKD+ HTN + DM (13%) and Others (18%). Out of 150 patients, it was observed that only 21 patients were bearing social behaviours like smoking (42%), followed by tobacco and alcohol which contributed (14%) and (19%) respectively.

Table 1: Demographic Characteristics of Patients

Variables	Number of patients	Percentage
Age-wise group Distribution		
31-40	12	8%
41-50	36	24%
51-60	59	39.3%
61-70	31	20.6%
71-80	12	8%
Gender		
Male	101	67.3%
Female	49	32.6%
Hospital stay		
1-5 days	36	24%
6-10 days	85	56.67%
11-15 days	15	10%
16-20 days	4	2.67%
20 or more days	10	6.66%
BMI Category		
Normal	29	19.30%
Overweight	89	59.30%
Obese Class I	31	20.60%
Obese Class II	1	0.60%

In our study, we looked into different brands of statins which were utilized and it was concluded that around 12 different brands were observed being prescribed to patients in our hospital. Among all the statins, Atorvastatin (62%) was mostly prescribed statin followed by Rosuvastatin (23%) and Combinaton therapy (15%). With the highest

utilisation, high-intensity statins in the doses of 40 mg (36.6%) and 20 mg (16%) were seen. With a per tablet cost variation of 91.6 percent, 9 percent of the patient population was treated with Atorvastatin 10 mg. The most significant price change was observed with Atorvastatin 40 mg (152.9%).

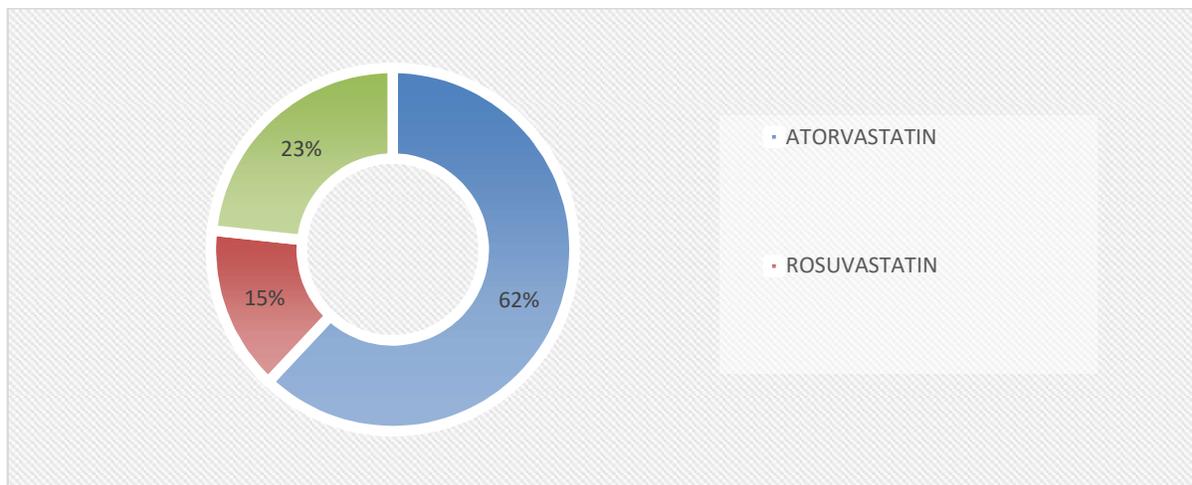


Figure 1: Drug Utilization Evaluation

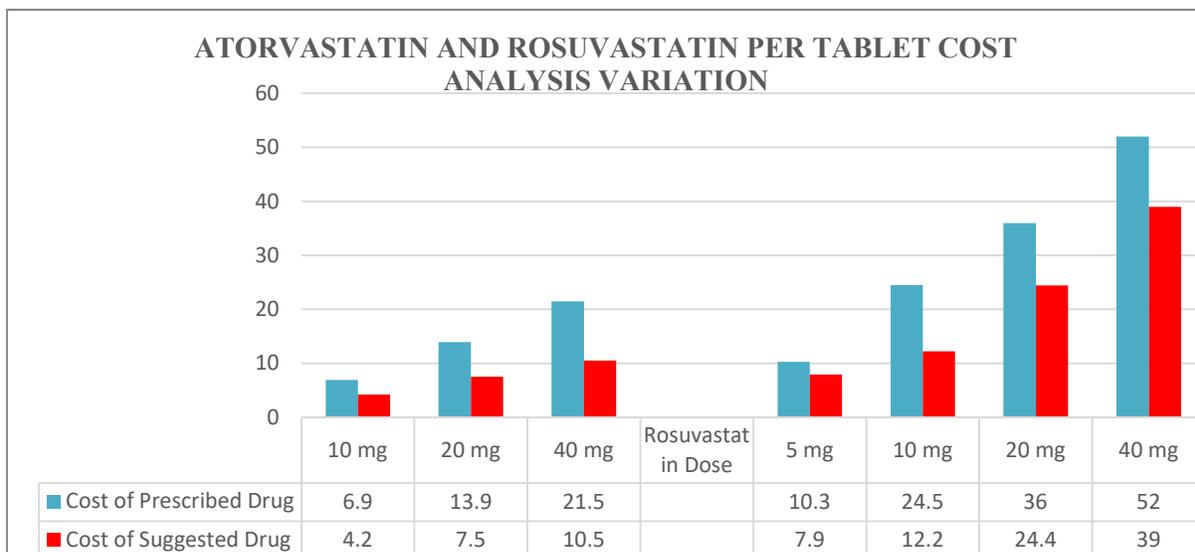


Figure 2: Atorvastatin and Rosuvastatin Per Tablet Cost Analysis

The highest price change was identified with Atorvastatin 40 mg (104.8 percent), whereas the lowest price variation was seen with Rosuvastatin 5 mg (30.3 percent). As per the pharmaco-economic analysis done in our study we created the monthly cost analysis of atorvastatin and rosuvastatin where the Cost of prescribed drug is in between 500- 1500. So we found highest monthly cost is of Atorvastatin 40mg and rosuvastatin 40mg

which was ₹645 and ₹1560 respectively. In a nutshell, it was observed that majority of the patients were cured during the statin therapy may it be after any surgery like angioplasty or angiography and if the therapy was also successful in post-operative stages where the statins were prescribed to eradicate the disease and improve the overall health of the individual.

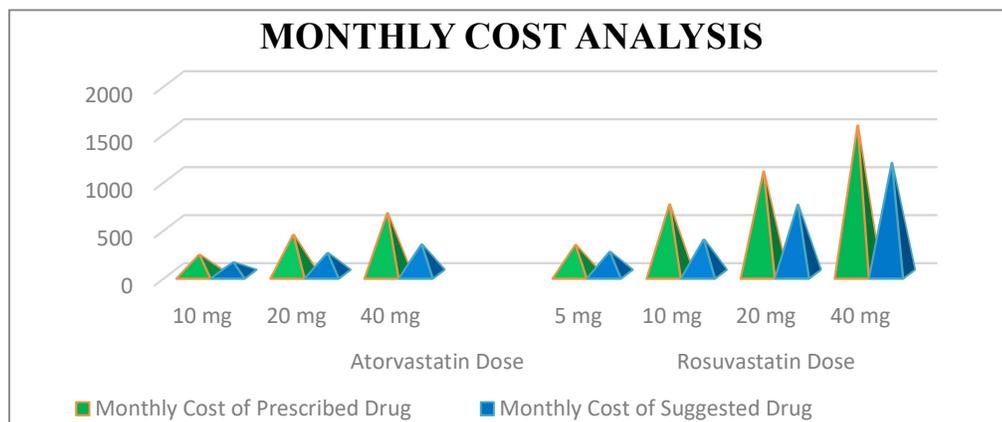


Figure 3: Monthly Cost Analysis

DISCUSSION

A Prospective study conducted in which total 150 prescriptions were collected for the study. A detailed analysis of prescriptions based on social history, diagnosis, co-morbid conditions, commonly prescribed statins were done. The incidence of cardiovascular disease and associated risk factors are considerably higher in older individuals. Cardiovascular disease is the most important

reason for death in older patients, out of this, over 80% of deaths are reported due to coronary heart disease (CHD) or stroke occur in individuals of 65 years of age or older. So the prevention and recurrence of cardiovascular events in older individuals remains a major concern. (Wenger et al) However in our study we found that maximum number of patients was diagnosed

with acute coronary syndrome at an age group of 51-60years

In our study, the age wise distributions of patients showed that 101(67.33%) were males and 49(32.66%) were female similar finding were observed in the studies conducted by Mukesh *et al.* most of the 59(39.33%) belongs to the age groups of 51-60 years, followed by 36(24%) in the age group of 41-50 years. **Gupta *et al.*** Most of patients 9(42.85%) had the habit of smoking as compare to Gupta *et al.* followed by 5(23.80%) had the habit of smoking, tobacco and alcohol consumption, 4(19.04%) patients with the habit of alcohol consumption and 3(14.28%) patients with the habit of tobacco consumption. 52(34.66%) patients had an ACS, which is consider being highest among all other CVDs, next to that stroke patients 42(28%) took the second place, then patients with other disease was found to be 28(18.66%), patients with CKD +HTN+ DM was found to be 20(13.33%) and patients with HTN was found to be 8(5.33%) Various other associated medical conditions also diagnosed in patients, 47 patients was associated with other disease, out of which 21(44.68%) patients was found with other co morbidities, next to that we found 18(38.29%) patients with HTN+DM, 3(6.38%) patients with ACS and 3(6.38%)

patients with HTN and 2(4.25%) patients with DM. Our study found that atorvastatin was the most commonly prescribed antihyperlipidemic drug (66%) followed by rosuvastatin (14%) similar finding were observed in studies conducted by **Gupta *et al.***, **Mukesh *et al.*** And the combination therapy of atorvastatin, rosuvastatin with aspirin, clopidogrel, ramipril, ezetimib was prescribed. In our study atorvastatin were prescribed in the dose of 10mg, 20mg, 40mg and 80mg among which 40mg (64.34%) atorvastatin was mostly prescribed to the patients followed by 20mg (22.60%) similar finding were observed in studies conducted by **Siva *et al.*** And rosuvastatin were prescribed in the dose of 5mg, 10mg, 20mg and 40mg. Rosuvastatin 20mg (44%) was mostly prescribed to the patients followed by 40mg (24%).

CONCLUSION

A prescription analysis is a powerful exploration tool to analyze the current trends in drug use. Our study was focused on the prescription patterns and drug utilization evaluation of statins it was found that atorvastatin was the most commonly prescribed drug followed by rosuvastatin and majority of the patients in our study were diagnosed with acute coronary syndrome so there is more need to perform laboratory

findings such as lipid levels, blood sugar levels and also physical examination such as BMI to detect the risk factor for cardiovascular event. There are few limitations in this study as it is a time bound study with a limited sample size it cannot detect seasonal variations in the pattern of drug use which would explain the unfortunate prescription of drugs. so it is important to identify patients who are truly statin intolerant to avoid unnecessary discontinuation of this beneficial treatment.

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