OPEN ACCESS ORIGINAL ARTICLE

Cost Variation Analysis of the Oral Drugs used in Dyslipidemia, Available in Nepalese Market

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Article Info:

Received Date: August, 2025

Acceptance Date: August, 2025

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Funding sources: None

Conflict of interest: None

Access the article online

DOI: 10.70027/jrahs92

Abstract

Introduction: Cardiovascular diseases is the topmost cause of disability adjusted life years in Nepal. There are many groups of anti-dyslipidemic drugs available in the market in different brands and strengths. This study was designed find the cost ratio and cost variation among the different brands available in the market.

Methods: This descriptive, cross-sectional market survey was conducted from June 2025 to July 2025. The retail price of anti-dyslipidemic drugs from different pharmacies, wholesalers in Nepal was collected. Similarly government-published price list was also reviewed. Cost ratio and percentage of cost variation was calculated form the extracted data.

Results: The cost variation between different brands of the drugs used in dyslipidemia was calculated. Highest cost ratio (1:2.16) and cost variation (116.84%) was found for atorvastatin 20mg, followed by atorvastatin 10mg which had cost ratio (1:2.14) and cost variation (114%). Minimum cost variation was observed among the 5mg and 40mg strength of atorvastatin.

Conclusion: Low-to-high variation in the cost of the same medicine in different doses with different brands were used to treat dyslipidemia. The drug with least cost variation was found to be 5mg strength of atorvastatin and drug with highest cost variation was found to be with 20mg atorvastatin.

Keywords: cost ratio, cost variation, cross sectional study, dyslipidemia

Introduction

Dyslipidemia is characterized by high total cholesterol, low density lipoprotein (LDL), triglyceride levels, low high density lipoprotein (HDL), or a combination of these factors.[1] Hyperlipidemia has a major role in the causation of atherosclerosis and its induced conditions, such as coronary heart disease (CHD), ischemic cerebrovascular disease (CVD), and peripheral vascular disease.[2]

Global deaths from CVD has markedly increased by 41% between 1990 and 2013.[3] The CVDs are the leading cause of disability in Nepal, accounting for about one-third of all deaths. The most common types are ischemic heart disease and stroke.[4]

Statins, Fibrates, Niacin, Ezetimibe are amongst the most common medicines used in dyslipidemia.[5] Different other anti-dyslipidemic drugs have also significant role and may be more suitable for patients with certain types of dyslipidemia.[6] Dyslipidemia treatment typically lasts for a long time, and adherence to the treatment plan is crucial for success.[7] Decreased drug cost improves medical adherence.[8] Prescribing a specific drug for a disease is solely the physician's decision. However, studies show that doctors often prescribe based on pharmaceutical marketing and personal benefits, rather than drug's quality and safety.[9]

Markets have a number of branded formulations for anti-dyslipidemic medications with variable pricing difference between the different brands of the same preparation.[10] Healthcare professionals face the challenge of using resources efficiently while providing quality patient care. By understanding pharmacoeconomics and its principles,

Citation:

Bhattarai AK, Shrestha MV. Cost variation analysis of the oral drugs used in dyslipidemia, available in Nepalese market. JRAHS Journal of Rapti Academy of Health Sciences. 2025;1(1):52-56.

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methods, and applications, they can make better decisions that benefit patients, the healthcare system, and society as a whole.[11]

This study aims to examine the prices and cost variability of dyslipidemia drugs available in Nepal's market, as registered with the Department of Drug Administration (DDA). It helps prescribers to understand retail prices, usage trends, and cost variations. The findings will assist physicians in selecting affordable anti-dyslipidemic drugs and inform policymakers about cost differences and necessary interventions.

Methods

This descriptive, cross-sectional study was carried out from June 2025 to July 2025 to find out the cost ratio of different drugs used in dyslipidemia in Nepal. A list of oral anti-dyslipidemic drugs recommended for use in the country was obtained from Nepalese National Formulary, third edition.[12] The data of minimum and maximum price (cost per ten tablets/ capsules) of available anti-dyslipidemic drugs in the same dosage form and strength manufactured by different pharmaceuticals companies in Nepal and India was obtained from different pharmacies, wholesalers and DDA website. The drugs and their different strengths, registered by the single company were excluded.

The price was obtained from different local retail stores, hospital pharmacies and wholesale importers through convenient sampling method from pre-structured proforma and DDA web-page. Data was collected and entered in checklist.

Cost ratio was calculated based on the maximum and minimum price of the same drug manufactured by different companies. Percentage of cost variation was calculated.

Cost ratio=Price of most expensive brand/ Price of least expensive brand

Percentage of Cost variation= {(Price of most expensive brand- Price of least expensive brand)/Price of least expensive brand} X 100[13]

Ethical clearance was taken from Kathmandu medical college Institutional Review Committee with reference number (25052025/13).

Data entry and analysis was done in Microsoft Excel 2013. Preliminary data management was done by removing duplication and standardizing the formats of data entries, including drug names, dosages, and currency units. The typographical errors in the drug names were also corrected. Descriptive statistics calculation was performed. Cost ratio and percentage cost variation was calculated and interpreted. By employing these statistical tools and tables, we effectively summarized and analyzed the cost variations of oral dyslipidemia drugs in the Nepalese market, providing valuable insights into pricing trends and helping stakeholders make informed decisions.

Results

This section presents the findings from the cost variation analysis of oral drugs for dyslipidemia available in the Nepalese market. It highlights key trends in pricing and variability among the medications analyzed. By examining these results, we aim to provide a clear understanding of the economic landscape for dyslipidemia treatments in Nepal. This portion covers statistics, cost variability, and tabular representations of the data.

This study revealed that, in Nepalese market there is wide variation in the prices of different brands of drugs used in dyslipidemia. The commonly prescribed drugs marketed by more than one company were for the drugs Atorvastatin, Rosuvastatin, Simvastatin, Fenofibrate, fixed dose combination of Atorvastatin 10mg plus Ezetimibe 10mg and Rosuvastatin 10mg plus Ezetimibe 10mg. (Table 1) Some other preparations listed National Formulary like Niacin, Gemfibrozil, Cholestyramine, and clofibrates were either not widely used, not registered, only marketed by single company or withdrawn from the market.

Table 1: List of study drugs with daily dose, dosage form and strength commonly used in Nepalese market.

S.N	Drug Name	Dosage forms available	Daily dose	Dosage/ Strength (mg)
1.	Atorvastatin	Tablets	10-80mg	5mg
				10mg
		Two drug fixed dose combinations		20mg
				40mg
2.	Rosuvastatin	Tablets	5-40mg	5mg
				10mg
		Two drug fixed dose combinations		20mg 40mg
3.	Simvastatin	Tablets	5-40mg	10mg
4.	Fenofibrate	Tablets	145-200mg	145mg
		Capsule		160mg
				200mg
5.	Atorvastatin +Ezetimibe	Fixed dose combinations	10mg+ 10mg	10mg+ 10mg
6.	Rosuvastatin +Ezetimibe	Fixed dose combinations	10mg+ 10mg	10mg+ 10mg

The maximum cost was found with Rosuvastatin 40mg which was NRs 702 for 10 tablets and minimum cost was found with Atorvastatin 10mg which was NRs 50 per 10 tablets. (Table 2)

Table 2: Minimum and maximum cost per 10 anti-dyslipidemic tablets/capsules

S.N	Drug	Dosage (mg)	Minimum cost (NRS)	Maximum cost (NRS)
1.	Atorvastatin	5mg	62	67.5
		10mg	50	107
		20mg	95	206
		40mg	338	370
2.	Rosuvastatin	5mg	100	120
		10mg	180	220
		20mg	330	444
		40mg	550	702
3.	Simvastatin	10mg	131	197
4.	Fenofibrate	145mg	120	234
		160mg	140	212
		200mg	230	427
5	Atorvastatin +Ezetimibe	10mg +10mg	180	293
6.	Rosuvastatin +Ezetimibe	10mg+ 10mg	300	384

Highest cost ratio (1:2.16) and cost variation (116.84%) was found for Atorvastatin 20mg, followed by Atorvastatin 10mg which had cost ratio (1:2.14) and cost variation (114%). Fenofibrate 200mg had cost ratio of (1:1.85) and cost variation (85.6%). Least cost variation were observed among the 5mg and 40mg strength of Atorvastatin. (Table 3)

There were only very few fixed dose combinations for anti-dyslipidemic drugs in the market. The cost ration (1:1.62) and cost variation (62.77%) was found for atorvastatin 10 mg+ Ezetimibe 10 mg and that of Rosuvastatin 10 mg+ Ezetimibe 10 mg was(1: 1.28) and (28.00%) congruently. (Table 3). Highest number of brands of anti-dyslipidemic drugs which were considered available in Nepalese market were for atorvastatin 10 mg (46) followed by atorvastatin 20 mg (43). The price of drugs from Indian companies were relatively higher than that from Nepalese companies.

Table 3: Other associated diseases among HIV positive individuals

S.N	Drug	Dosage (mg)	Cost Ratio	Cost variation (%)
1.	Atorvastatin	5mg	1.08	8.87
		10mg	2.14	114.0
		20mg	2.16	116.84
		40mg	1.09	9.46
2.	Rosuvastatin	5mg	1.2	20.0
		10mg	1.22	22.22
		20mg	1.34	34.54
		40mg	1.27	27.6
3.	Simvastatin	10mg	1.5	50.38
4.	Fenofibrate	145mg	1.95	95.0
		160mg	1.51	51.4
		200mg	1.85	85.6
5.	Atorvastatin +Ezetimibe	10mg +10mg	1.62	62.77
6.	Rosuvastatin +Ezetimibe	10mg+ 10mg	1.28	28.0

Discussion

This study showed that in Nepalese market, there was wide variation in the prices of different brands of drugs used in dyslipidaemia whose price are not properly regulated by government.

Government regulates price of essential medicines by setting maximum retail price for key drugs. Atorvastatin 10mg and 20mg, and Fenofibrate 80mg and 160mg are included among the National List of Essential Drugs (NLEM) sixth revision selected for treating Non-communicable disease in primary care on Nepal. Drugs included in NLEM are subjected to government price regulations and also prioritized supply.[13] In this study, the cost variation percentage of Atorvastatin 5mg was 8.87%, Atorvastatin 10mg was 114%, Atorvastatin 20mg was 116.84% and Atorvastatin 40mg was 9.46% respectively. Atorvastatin being incorporated in the NLEM price regulation scheme might be the reason behind the maintenance of its maximum retail price within the government limit. Government of Nepal has fixed the price of Atorvastatin 5mg, 10mg and 20mg to be NRs. 6.75, NRs.10.78 and NRs.20.60 respectively. Surprisingly, although maximum retail limit is fixed with Atorvastatin 10mg and 20mg, they were found to have the highest cost variations. The reason might be the intense competition between the pharmaceutical companies. Highest number of the registered brands was in those two segments of Atorvastatin 10mg and 20mg. Although Fenofibrate is also component of NLEM but without imposed maximum retail pricing, surprisingly the cost variation of Fenofibrate 160 mg was just 51.4%. Another popular Fenofibrate 200mg strength was found to have cost ratio of 1.85 and cost variation 85.6%. Only two anti-dyslipidemic drugs are included in the NLEM sixth edition 2021. Other drugs and strength should be tried to incorporate for better availability and affordability.

According to study by Khanal S et al.[14] published in 2019 AD, which studied the availability, price, and affordability of essential medicines to manage non-communicable

diseases in Nepal, the median price of Atorvastatin 5mg (Nrs 66), Atorvastatin 10mg (Nrs 88), and Atorvastatin 20mg (Nrs 160). The findings of median price were lower than the government allotted maximum retail price for Atorvastatin. This might be due to the market competition, which can be assumed by huge number of brand registered and marketed of these drugs.

In this study, highest cost ratio (1:2.16) and cost variation (116.84%) was found for Atorvastatin 20mg, followed by Atorvastatin 10mg which had cost ratio (1:2.14) and cost variation (114%). Fenofibrate 200mg had cost ratio of (1:1.85) and cost variation (85.6%). The findings obtained from the study done by Shukla and Sharma[15] in India in 2016 AD, the highest cost variation was also with Atorvastatin. Atorvastatin 20mg had cost ratio (1: 11.7) and cost variation 1017.79% while that of atorvastatin 10mg was 1:10.74 and cost variation of 974.91%. The minimum cost of Atorvastatin 10mg was NRs 19.2 and Atorvastatin 20mg was NRs 31, while maximum cost was also NRs 207 and NRs 340 correspondingly, which made the difference in variation. The Fenofibrate 160 mg had cost ratio of 1:1.43 with cost variation 43.12%. The combination of Atorvastatin 10mg and Ezetimibe 10mg cost ratio was 1:2.8 and cost variation was 180.36%. Most of the findings were similar but the scale of variation was more in that study. The comparisons of this two studies done in the two neighbouring countries with free border and trade, and difference in the scale of price variation signifies importance of regulation of the price by the regulatory bodies.

Higher medication costs are an important factor for medication non-adherence. Treatment of dyslipidaemia has a long course of duration. For the successful treatment of dyslipidaemia, adherence to the treatment duration is very important.[7] Quality of medicines has no correlation with their corresponding prices. The price of medicines have been found to be linked with their marketing strategies.[16] Implementation of medicines fair pricing rule with a range of policies, including cost-plus pricing, external price referencing, internal reference pricing, and mark-up policies are needed. Regardless of some method of price control is observed in Nepal, the country is missing an intelligible policy.[17]

Limitations

It only compares the cost of different molecules without assessing their effectiveness. Cost analysis alone may not guide optimal resource allocation. We additionally require cost utility analysis also. This is conducted at single point of time, so does not account for the future cost or trends. And, price of the drugs are regularly subjected to change.

Recommendations

Establishment of drug price manual of different company and improving the awareness among doctors can play an important role in reducing cost variation of drugs. Various approaches like drug regulation policy, generic drug manufacturing and prescription system may help to reduce the cost variations. Pharmacoeconomics and its components should be incorporated in undergraduate and postgraduate medical education. This has been tried to some extent by allowing the undergraduate MBBS students to formulate Personal Drugs (P-drug) in some medical schools of Nepal. This will upsurge their ability to select the proper drug without compromising the quality of health care. Local pharmaceutical products should be prioritized as they seem to produce more cost effective drugs.

Conclusion

Treatment of dyslipidemia is one among the highly prescribed drugs and has long course of treatment. In Nepalese market, it was found that there was wide-range in price variation of different brands of the same generic and strength of anti-dyslipidemic drug. Various multidisciplinary approaches are required to regulate price variation of different brands of the same anti-dyslipidemic drug.

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