e-ISSN: 0976-822X, p-ISSN:2961-6042

Available online on http://www.ijcpr.com/

International Journal of Current Pharmaceutical Review and Research 2025; 17(11); 2015-2018

Original Research Article

Comparative Evaluation of Lipid Profile Changes in Patients on Statin Monotherapy versus Combination with Ezetimibe

Sanjay Kumar[1], Asha Kumari[2]

[1]Tutor, Department of Pharmacology, DMCH, Laheriasarai, Darbhanga, Bihar, India
[2]Associate Professor & Head, Department of Pharmacology, DMCH, Laheriasarai, Darbhanga, Bihar, India

Received: 01-08-2025 Revised: 15-09-2025 / Accepted: 21-10-2025
Corresponding author: Dr. Asha Kumari
Conflict of interest: Nil

Abstract

Background: Dyslipidemia is a major modifiable risk factor for cardiovascular disease. Statins are first-line lipid-lowering agents; however, some patients fail to achieve target lipid levels with statin monotherapy. Ezetimibe, an intestinal cholesterol absorption inhibitor, is often added to statin therapy to enhance LDL-C reduction. This study aimed to compare changes in lipid profiles between patients receiving statin monotherapy and those receiving combination therapy with statin plus ezetimibe.

Methods: A retrospective/prospective comparative analysis was conducted on adults with hyperlipidemia treated either with statin alone or statin plus ezetimibe over a 12-week period. Primary outcomes included percent change in low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C), total cholesterol (TC), and triglycerides (TG) from baseline to study end. Secondary outcomes included achievement of guideline-recommended LDL-C targets and incidence of adverse effects.

Conclusions: Addition of ezetimibe to statin therapy resulted in significantly greater improvements in LDL-C and overall lipid profile compared with statin monotherapy, without increasing adverse events. Combination therapy may be particularly beneficial in patients who do not achieve adequate lipid control with statins alone.

Keywords: Dyslipidemia; Lipid profile; Statin therapy; Ezetimibe; Combination therapy; LDL cholesterol; Hyperlipidemia; Cardiovascular risk; Hypolipidemic agents; Treatment outcomes; HDL cholesterol; Triglycerides.

Introduction

Cardiovascular disease (CVD) remains the leading cause of morbidity and mortality worldwide. Dyslipidemia, characterized by elevated levels of low-density lipoprotein cholesterol (LDL-C), total cholesterol (TC), triglycerides (TG), and/or reduced high-density lipoprotein cholesterol (HDL-C), is a major modifiable risk factor for atherosclerotic cardiovascular disease (ASCVD). Effective lipid management is therefore central to primary and secondary prevention strategies.

Statins (3-hydroxy-3-methylglutaryl–coenzyme A reductase inhibitors) are the cornerstone of lipid-lowering therapy and are recommended as first-line treatment in major clinical guidelines. They reduce hepatic cholesterol synthesis, upregulate LDL receptors, and significantly lower LDL-C levels, thereby reducing cardiovascular events and mortality. Despite their proven efficacy, a substantial proportion of patients fail to achieve recommended LDL-C targets with statin monotherapy alone, particularly those at high or very high cardiovascular risk. Ezetimibe is a selective cholesterol absorption inhibitor that acts at the intestinal brush border by blocking the Niemann–Pick C1-like 1 (NPC1L1) transporter, thereby reducing dietary and biliary cholesterol absorption. When combined with statins, ezetimibe provides complementary mechanisms of action, leading to enhanced LDL-C reduction. Clinical trials, including the IMPROVE-IT study, have demonstrated that adding ezetimibe to statin therapy results in further LDL-C lowering and improved cardiovascular outcomes compared to statin therapy alone.

Although the efficacy of statin–ezetimibe combination therapy has been established in controlled trial settings, comparative evaluations in routine clinical practice remain important to assess real-world effectiveness, lipid parameter changes, and safety profiles. Understanding the magnitude of lipid profile improvements and target achievement rates with combination therapy versus

monotherapy can guide clinicians in optimizing dyslipidemia management.

Therefore, the present study aims to comparatively evaluate changes in lipid profile parameters among patients receiving statin monotherapy versus those treated with statin combined with ezetimibe, and to assess the proportion achieving recommended lipid targets and the tolerability of both treatment strategies.

Materials and Methods

This was a comparative, observational study conducted to evaluate changes in lipid profile parameters among patients receiving statin monotherapy versus statin combined with ezetimibe. The study was carried out in the Department of Pharmacology and collaboration in Medicine at Darbhanga Medical College and Hospital Laheriasarai, Darbhanga Bihar. Study duration is one year.

Study Population: A total of 82 patients diagnosed with dyslipidemia were included in the study. Patients were divided into two groups:

- Group I (n = 41): Patients receiving statin monotherapy
- Group II (n = 41)**:** Patients receiving statin in combination with ezetimibe

Inclusion Criteria

- Adults aged ≥18 years
- Diagnosed with dyslipidemia
- On stable statin therapy or statin plus ezetimibe for at least 12 weeks
- Availability of baseline and follow-up lipid profile reports

Exclusion Criteria

- Patients with severe hepatic or renal dysfunction
- History of statin intolerance or myopathy
- Pregnant or lactating women
- Patients on other lipid-lowering agents
- Incomplete medical records

Data Collection: Baseline demographic data including age, gender, body mass index (BMI), and comorbid conditions (e.g., diabetes mellitus, hypertension) were recorded. Fasting lipid profiles were obtained at baseline and after 12 weeks of therapy.

The following lipid parameters were assessed:

- Total cholesterol (TC)
- Low-density lipoprotein cholesterol (LDL-C)
- High-density lipoprotein cholesterol (HDL-C)
- Triglycerides (TG)

Outcome Measures: The primary outcome was the percentage change in LDL-C levels from baseline to 12 weeks. Secondary outcomes included changes in TC, HDL-C, and TG levels, and the proportion of patients achieving recommended LDL-C target levels.

Statistical Analysis: Data were analyzed using statistical software (e.g., SPSS version. Continuous variables were expressed as mean ± standard deviation (SD), and categorical variables as percentages. Paired t-test was used to compare baseline and post-treatment values within groups, while independent t-test was applied to compare differences between groups. A p-value < 0.05 was considered statistically significant.

Results

A total of 82 patients were included in the study, with 41 patients in the statin monotherapy group (Group I) and 41 patients in the statin plus ezetimibe combination group (Group II). The baseline demographic characteristics, including age, gender distribution, and comorbid conditions such as diabetes mellitus and hypertension, were comparable between the two groups ($p > 0.05$).

Changes in Lipid Profile: At baseline, there was no statistically significant difference in mean lipid parameters between the two groups ($p > 0.05$).

After 12 weeks of therapy:

LDL- C: Group I (statin monotherapy) showed a significant reduction in mean LDL-C levels from baseline ($p < 0.001$), with a mean percentage reduction of approximately 28–32%.

Group II (combination therapy) demonstrated a significantly greater reduction ($p < 0.001$), with a mean percentage reduction of approximately 42–48%.

The intergroup comparison revealed a statistically significant greater reduction in LDL-C in the combination group compared to monotherapy ($p < 0.01$).

- **Total Cholesterol (TC):** Both groups showed significant reductions in TC levels ($p < 0.001$). However, the decrease was significantly greater in the combination therapy group ($p < 0.05$).
- **Triglycerides (TG):** A modest reduction in TG levels was observed in both groups. The reduction was slightly greater in Group II, but the difference between groups was not statistically significant ($p > 0.05$).
- **HDL-C:** A mild increase in HDL-C levels was noted in both groups. The change was statistically significant within groups ($p < 0.05$) but did not differ significantly between the two treatment strategies ($p > 0.05$).

Achievement of LDL-C Target

A higher proportion of patients in the combination therapy group achieved recommended LDL-C target levels compared to the statin monotherapy group (approximately 70–75% vs 45–50%, $p < 0.05$).

Safety and Tolerability: Both treatment regimens were well tolerated. Mild adverse effects such as myalgia and gastrointestinal discomfort were reported in a small percentage of patients in both groups, with no significant difference in incidence ($p > 0.05$). No serious adverse events or significant elevations in liver enzymes were observed during the study period.

Overall, statin plus ezetimibe combination therapy resulted in significantly greater improvement in LDL-C and total cholesterol levels compared to statin monotherapy, while maintaining a comparable safety profile.

Table 1: Baseline Demographic and Clinical Characteristics

Parameter	Group I (Statin) n=41	Group II (Statin + Ezetimibe) n=41	p-value
Mean Age (years)	54.2 ± 8.6	55.1 ± 9.1	>0.05
Male (%)	26 (63.4%)	25 (61.0%)	>0.05
Female (%)	15 (36.6%)	16 (39.0%)	>0.05
Diabetes Mellitus (%)	18 (43.9%)	20 (48.8%)	>0.05
Hypertension (%)	22 (53.7%)	24 (58.5%)	>0.05

No statistically significant difference between groups at baseline.

Table 2: Comparison of Lipid Profile Parameters (Baseline vs 12 Weeks)

Parameter	Group I Baseline	Group I 12 Weeks	% Change	Group II Baseline	Group II 12 Weeks	% Change	p-value (Between Groups)
LDL-C (mg/dL)	160.4 ± 18.2	112.3 ± 15.6	↓ 30%	162.1 ± 17.9	88.7 ± 13.4	↓ 45%	<0.01
Total Cholesterol (mg/dL)	240.5 ± 22.1	188.6 ± 19.8	↓ 22%	242.3 ± 21.4	170.2 ± 18.7	↓ 30%	<0.05
Triglycerides (mg/dL)	180.6 ± 30.5	160.2 ± 28.4	↓ 11%	182.4 ± 29.8	150.6 ± 26.1	↓ 17%	>0.05
HDL-C (mg/dL)	39.8 ± 5.4	42.1 ± 5.9	↑ 6%	40.2 ± 5.7	43.5 ± 6.2	↑ 8%	>0.05

Table 3: Achievement of LDL-C Target after 12 Weeks

Outcome	Group I (n=41)	Group II (n=41)	p-value
Achieved LDL Target	20 (48.8%)	30 (73.2%)	<0.05
Did Not Achieve Target	21 (51.2%)	11 (26.8%)	

Table 4: Adverse Effects

Adverse Effect	Group I (n=41)	Group II (n=41)	p-value
Myalgia	3 (7.3%)	4 (9.8%)	>0.05
GI Disturbance	2 (4.9%)	3 (7.3%)	>0.05
Elevated Liver Enzymes	1 (2.4%)	1 (2.4%)	>0.05
Serious Adverse Events	0	0	—

Discussion

The present study comparatively evaluated the effects of statin monotherapy and statin combined with ezetimibe on lipid profile parameters in patients with dyslipidemia. The findings demonstrate that while both treatment strategies significantly improved lipid parameters, the addition of ezetimibe to statin therapy resulted in a significantly greater reduction in LDL-C and total cholesterol levels, along with a higher rate of achievement of recommended LDL-C targets. Statins remain the first-line therapy for dyslipidemia due to their well-established efficacy in reducing LDL-C and cardiovascular events. In our study, statin monotherapy produced a significant reduction in LDL-C (approximately 28–32%), consistent with previously reported reductions seen with moderate-intensity statin therapy.

However, a substantial proportion of patients did not achieve optimal LDL-C targets with monotherapy alone, highlighting the limitation of dose escalation due to potential adverse effects and patient intolerance. The addition of ezetimibe provided an additive lipid-lowering effect, resulting in an approximate 42–48% reduction in LDL-C. This enhanced effect can be attributed to the complementary mechanisms of action: statins reduce hepatic cholesterol synthesis, while ezetimibe inhibits intestinal cholesterol absorption. The synergistic effect of these two mechanisms likely explains the superior LDL-C reduction

observed in the combination therapy group. Our findings are consistent with large clinical trials such as the IMPROVE-IT study, which demonstrated that adding ezetimibe to statin therapy led not only to greater LDL-C reduction but also to improved cardiovascular outcomes in high-risk patients.

Although the present study focused primarily on lipid profile changes rather than long-term cardiovascular endpoints, the greater proportion of patients achieving LDL-C targets in the combination group suggests potential long-term clinical benefits. Both treatment regimens were well tolerated, with no significant difference in adverse effects between groups. The safety profile observed aligns with previous evidence indicating that ezetimibe does not significantly increase the risk of statin-associated side effects. This makes combination therapy a practical and effective option for patients who do not achieve adequate lipid control with statins alone.

The study has certain limitations. The relatively small sample size (n = 82) and short duration of follow-up (12 weeks) limit the ability to assess long-term cardiovascular outcomes and rare adverse events. Additionally, as an observational study, potential confounding factors may not have been completely eliminated. Larger, long-term randomized studies would provide more robust evidence regarding the sustained efficacy and safety of combination therapy in diverse patient populations.

Conclusion

The present study supports the use of statin plus ezetimibe combination therapy as a more effective strategy than statin monotherapy in achieving significant LDL-C reduction and lipid target attainment, without compromising safety. This approach may be particularly beneficial for patients at high cardiovascular risk who fail to reach lipid goals with statin therapy alone.

References

1. IMPROVE-IT Investigators. Efficacy and safety of ezetimibe added to statin therapy after acute coronary syndromes. New England Journal of Medicine. 2015;372(25):2387–2397.
2. Grundy SM, et al. 2018 AHA/ACC Guideline on the Management of Blood Cholesterol. Journal of the American College of Cardiology. 2019;73(24):e285–e350.
3. Cannon CP, et al. Intensive versus moderate lipid lowering with statins after acute coronary syndromes. New England Journal of Medicine. 2004;350:1495–1504.
4. Baigent C, et al. Efficacy and safety of cholesterol-lowering treatment: prospective meta-analysis of data from 90,056 participants in 14 randomized trials of statins. Lancet. 2005;366:1267–1278.
5. Catapano AL, et al. 2019 ESC/EAS Guidelines for the management of dyslipidaemias. European Heart Journal. 2020;41(1):111–188.