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Failure To Achieve LDL-C And Hs-CRP Targets In Post-Acute Myocardial Infarction Patients: Prevalence And Predictors

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ABSTRACT:
Background: Residual cardiovascular risk after acute myocardial infarction (AMI) is driven not only by dyslipidemia but also by systemic inflammation. High-sensitivity C-reactive protein (hs-CRP) and low-density lipoprotein cholesterol (LDL-C) represent two independent and complementary biomarkers of risk. Achieving dual therapeutic targets for both markers has been shown to improve outcomes, yet data in Southeast Asian populations remain scarce.
Objectives: This study investigated the prevalence and predictors of failure to achieve hs-CRP and LDL-C targets in post-AMI patients in Vietnam.
Methods: A descriptive cross-sectional study was conducted on 93 patients with prior AMI at Tam Duc Heart Hospital between September 2024 and June 2025. Demographic, clinical, and laboratory parameters were collected. hs-CRP and LDL-C levels were measured, and target achievement rates were assessed. Logistic regression analyses were performed to identify independent predictors.
Results: Among 93 patients (mean age 66.1 ± 10.1 years, 76.3% male), 24.7% had hs-CRP ≥ 2 mg/L and 43.0% failed to achieve LDL-C < 70 mg/dL. Overall, 51.6% of patients failed to reach at least one target, with 16.1% failing both. Chronic kidney disease, sacubitril/valsartan use, and LDL-C ≥ 70 mg/dL were associated with failure to achieve hs-CRP targets. Diabetes mellitus and elevated hs-CRP were associated with LDL-C non-attainment. Use of ACEI/ARB therapy was identified as a protective factor against dual target failure.
Conclusions: A substantial proportion of Vietnamese post-AMI patients fail to achieve dual hs-CRP and LDL-C targets, with diabetes and chronic kidney disease contributing to residual risk. These findings underscore the need for intensified secondary prevention strategies addressing both lipid and inflammatory pathways.

Keywords: Acute myocardial infarction; hs-CRP; LDL-C; residual cardiovascular risk; secondary prevention; Vietnam.

Highlights

- Approximately half of post-AMI patients in Vietnam failed to achieve dual therapeutic targets for LDL-C and hs-CRP.
- Diabetes mellitus and chronic kidney disease were key predictors of residual risk.
- Sacubitril/valsartan therapy was associated with failure to achieve hs-CRP targets.
- Use of ACEI/ARB was independently protective against dual target failure.
- Findings highlight the need for integrated lipid-lowering and anti-inflammatory strategies in secondary prevention.

Clinical Implications

The present findings have direct implications for secondary prevention strategies in post-AMI care. First, the observation that nearly half of Vietnamese patients failed to achieve LDL-C or hs-CRP targets underscores the importance of routine monitoring of both lipid and inflammatory markers in clinical practice. Second, high-risk groups such as patients with diabetes mellitus or chronic kidney disease warrant more aggressive and tailored therapeutic approaches. Third, the protective association

of ACEI/ARB therapy highlights the potential benefit of prioritizing agents with pleiotropic effects that extend beyond blood pressure control. Finally, integration of emerging anti-inflammatory therapies may represent the next step in addressing residual cardiovascular risk and should be considered in future interventional trials.

Figure 1. Prevalence of target failure among post-AMI patients.

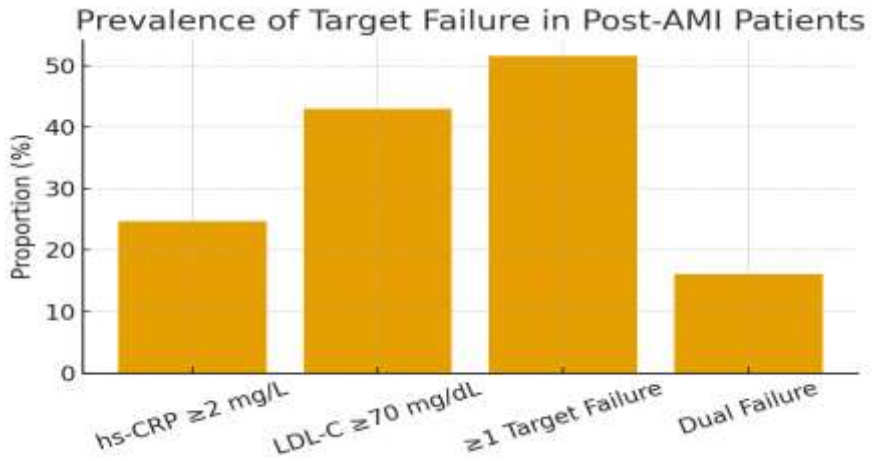
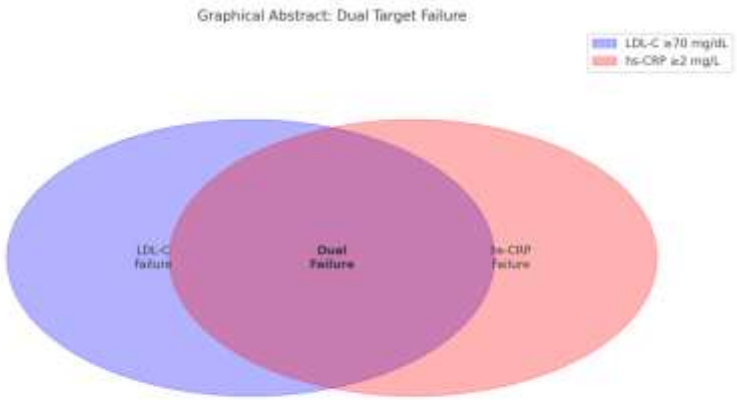


Figure 2. Graphical abstract illustrating dual target failure (LDL-C and hs-CRP).



Future Directions

Future research should expand upon these findings through larger, multicenter studies across diverse Vietnamese and Southeast Asian populations to confirm external validity. Longitudinal cohort designs are warranted to determine the prognostic significance of persistent hs-CRP elevation in post-AMI patients and to evaluate the impact of dual-target achievement on long-term outcomes. In addition, interventional studies exploring anti-inflammatory therapies—such as colchicine, interleukin-1β inhibitors, or other emerging agents—should be prioritized to complement intensive lipid-lowering strategies. Genetic and ethnically tailored approaches may also yield further insight into residual risk mechanisms unique to Asian populations. Ultimately, integration of lipid and inflammatory targets into comprehensive secondary prevention algorithms represents a promising avenue for reducing cardiovascular morbidity and mortality.

INTRODUCTION

Cardiovascular diseases (CVDs), particularly coronary artery disease (CAD), represent the leading global cause of mortality and morbidity. Acute myocardial infarction (AMI) constitutes one of the

major causes of morbidity and mortality globally, contributing significantly to the overall burden of cardiovascular disease. Despite remarkable advances in the management of acute exacerbations and secondary prevention, post-AMI patients still face a substantial risk of recurrent events and adverse outcomes. The incidence of major adverse cardiovascular events (MACE) remains 1.5 to 3 times higher than in the general population. Therefore, there is a pressing need for reliable biomarkers to monitor and predict future cardiovascular risk.

Extending beyond lipid-lowering strategies, inflammatory pathways are now established as central drivers of atherosclerotic pathogenesis, disease advancement, and post-myocardial infarction recurrent event risk. High-sensitivity C-reactive protein (hs-CRP) is an independent and widely recognized biomarker of systemic inflammation, which is strongly associated with the incidence of cardiovascular events and poor outcomes following acute coronary syndromes and percutaneous coronary intervention (PCI). Importantly, achieving target levels of both low-density lipoprotein cholesterol (LDL-C) and hs-CRP has been associated with significantly improved clinical outcomes in post-AMI patients—a concept referred to as the "dual target" strategy. This underscores the importance of addressing both lipid-related and inflammation-related risks in comprehensive secondary prevention.

However, to our knowledge, no studies have been conducted in Vietnam to investigate this issue. Therefore, we conducted a study to determine the proportion of post-AMI patients who fail to achieve target levels of hs-CRP and LDL-C, and to identify predictive factors. This serves as a foundation for future clinical trials.

METHODS

Trial design: A descriptive cross-sectional study.

Study period and setting: The study was conducted at Tam Duc Heart Hospital from September 2024 to June 2025.

Study population: Patients aged ≥ 18 years with a history of acute myocardial infarction (AMI) of at least 1 month, who presented to the Department of Cardiology at Tam Duc Heart Hospital during the study period from September 2024 to June 2025.

Exclusion criteria: Patients with acute coronary syndrome within 1 month prior to enrollment, those with active infections, currently receiving immunosuppressive therapy or chemotherapy, or with high-sensitivity CRP (hs-CRP) ≥ 15 mg/L.

Data collection: Demographic characteristics, cardiovascular risk factors, medical history, and laboratory parameters were recorded, including complete blood count, total cholesterol, LDL-C, HDL-C, triglycerides, high-sensitivity C-reactive protein (hs-CRP), fasting plasma glucose, and HbA1c; as well as myocardial infarction phenotype and treatment characteristics.

Statistical analysis: Data were processed using SPSS software. Comparisons between groups were performed using the Chi-square test and the Mann–Whitney U test. Univariate and multivariate logistic regression analyses were conducted. A p-value < 0.05 was considered statistically significant.

Ethical considerations: The study was approved by the Ethics Committee in Biomedical Research of Pham Ngoc Thach University of Medicine under the approval certificate No. 1142/TĐHYKPNT-HĐĐĐ dated September 20, 2024.

RESULTS

General characteristics

A total of 93 patients were included in the analysis. The mean age of the study population was 66.14 ± 10.14 years. Male patients accounted for 76.3%. Among the participants, 24.73% had hs-CRP levels ≥ 2 mg/L. The proportion of patients not achieving the LDL-C target was 43.01%, while 56.99% achieved the target. The proportion of patients who failed to achieve both LDL-C and hs-CRP targets was 16.13%.

Table 1. Baseline characteristics stratified by hs-CRP target achievement

Variable	Not achieving hs-CRP target	Achieving hs-CRP target	p-value
Age, mean ± SD (years)	66.83 ± 9.79	66.31 ± 10.32	0.835[a]

Male, n (%)	15 (65.22)	56 (80)	0.148[b]
BMI, mean ± SD (kg/m²)	23.63 ± 3.25	24.78 ± 2.87	0.112[a]
Smoking, n (%)	11 (47.83)	28 (40)	0.509[b]
Hypertension, n (%)	23 (100)	69 (98.57)	0.999[b]
Diabetes mellitus, n (%)	14 (60.87)	35 (50.00)	0.365[b]
Heart failure, n (%)	10 (43.48)	19 (27.14)	0.142[b]
Chronic kidney disease, n (%)	8 (34.78)	9 (12.86)	**0.028[c]**
Atrial fibrillation, n (%)	1 (4.35)	5 (7.14)	0.999[c]
Stroke, n (%)	1 (4.35)	3 (4.29)	0.999[c]

a: t-test; b: Chi-square test; c: Fisher's exact test; Mean: mean; SD: standard deviation; BMI: body mass index

Findings: There was no statistically significant difference between the two groups in terms of age, sex, BMI, smoking status, hypertension, heart failure, atrial fibrillation, or stroke. However, the prevalence of chronic kidney disease was significantly higher in the group that did not achieve the hs-CRP target (34.78% vs. 12.86%, p = 0.028).

Table 2. Laboratory characteristics, MI phenotype, and revascularization between patients achieving and not achieving hs-CRP target

Variable	Not achieving hs-CRP target	Achieving hs-CRP target	p-value
Total cholesterol, mean ± SD (mg/dL)	135.11 (53.10)	123.74 (50.18)	0.355[a]
HDL-C, mean ± SD (mg/dL)	42.50 (17.49)	41.85 (12.58)	0.846[a]
LDL-C, mean ± SD (mg/dL)	82.05 (25.54)	68.67 (30.80)	0.063[a]
Triglycerides, mean ± SD (mg/dL)	143.87 (87.64)	125.85 (67.64)	0.307[a]
LDL-C target achieved, n (%)	15 (65.22)	25 (35.71)	**0.013[b]**
MI phenotype, n (%)	9 (39.13)	25 (35.71)	0.768[b]
Revascularization, n (%)	21 (91.30)	60 (85.71)	0.864[c]

a: t-test; b: Chi-square test; c: Fisher's exact test; Mean: mean; SD: standard deviation; MI: myocardial infarction

Findings: There were no statistically significant differences between the two groups in terms of total cholesterol, HDL-C, LDL-C, triglycerides, MI phenotype, or revascularization (p > 0.05). However, patients not achieving the LDL-C target were significantly more common in the group not achieving the hs-CRP target compared with the group achieving the target (p = 0.013, OR = 3.37).

Table 3. Treatment characteristics between patients achieving and not achieving hs-CRP target

Variable	Not achieving hs-CRP target	Achieving hs-CRP target	p-value
ACEI/ARB, n (%)	19 (82.61)	66 (94.29)	0.100[a]
Beta-blockers, n (%)	16 (69.57)	45 (64.29)	0.644[b]
Aspirin, n (%)	14 (60.87)	40 (57.14)	0.753[b]
Clopidogrel, n (%)	15 (65.22)	34 (48.57)	0.165[b]
Ticagrelor, n (%)	5 (21.74)	15 (21.43)	0.999[a]
Prasugrel, n (%)	0 (0)	1 (1.43)	0.999[c]
High-intensity statins, n (%)	19 (82.61)	44 (62.86)	0.122[a]

Ezetimibe, n (%)	11 (47.83)	41 (58.57)	0.368[b]
SGLT2i, n (%)	15 (65.22)	34 (48.57)	0.165[b]
Sacubitril/valsartan, n (%)	7 (30.43)	7 (10.00)	**0.038**[a]

a: t-test; b: Chi-square test; c: Fisher's exact test; ACEI: angiotensin-converting enzyme inhibitors; ARB: angiotensin receptor blockers; SGLT2i: sodium-glucose co-transporter 2 inhibitors

Findings: Sacubitril/valsartan was used more frequently in the group that failed to attain the hs-CRP target, with this difference reaching statistical significance (p = 0.038).

Table 4. Baseline characteristics according to LDL-C target achievement

Variable	**Not achieving LDL-C target**	**Achieving LDL-C target**	**p-value**
Age, mean ± SD (years)	66.25 ± 10.12	66.58 ± 10.25	0.876[a]
Male, n (%)	29 (72.5)	42 (79.25)	0.609[a]
BMI, mean ± SD (kg/m²)	24.25 (3.23)	24.68 (2.82)	0.491[a]
Smoking, n (%)	17 (42.50)	22 (41.51)	0.924[b]
Hypertension, n (%)	40 (100)	52 (98.11)	0.999[c]
Diabetes mellitus, n (%)	26 (65.00)	23 (43.40)	**0.039**[b]
Heart failure, n (%)	15 (37.50)	14 (26.42)	0.253[b]
Chronic kidney disease, n (%)	10 (25.00)	7 (13.21)	0.145[c]
Atrial fibrillation, n (%)	4 (10.00)	2 (3.77)	0.397[c]
Stroke, n (%)	2 (5.00)	2 (3.77)	0.999[c]

a: t-test; b: Chi-square test; c: Fisher's exact test; Mean: mean; SD: standard deviation; BMI: body mass index

Findings: There were no statistically significant differences between the two groups regarding age, sex, BMI, smoking, hypertension, heart failure, chronic kidney disease, atrial fibrillation, or stroke. However, diabetes mellitus was more prevalent in the group not achieving the LDL-C target compared with the group achieving the target (65% vs. 43.4%, p = 0.039).

Table 5. Laboratory characteristics, MI phenotype, and revascularization between patients achieving and not achieving LDL-C target

Variable	**Not achieving LDL-C target**	**Achieving LDL-C target**	**p-value**
Total cholesterol, mean ± SD (mg/dL)	147.52 (68.63)	110.73 (21.23)	**0.002**[a]
HDL-C, mean ± SD (mg/dL)	41.40 (17.27)	42.48 (10.73)	0.711[a]
hs-CRP, median [IQR] (mg/L)	1.1 (0.45 – 2.78)	0.7 (0.35 – 1.55)	**0.047**[d]
Triglycerides, mean ± SD (mg/dL)	150.52 (86.56)	115.04 (57.08)	**0.028**[a]
MI phenotype, n (%)	16 (40.00)	18 (33.96)	0.549[b]
Revascularization, n (%)	36 (90.00)	45 (84.91)	0.421[c]

a: t-test; b: Chi-square test; c: Fisher's exact test; d: Mann–Whitney U test; Mean: mean; SD: standard deviation; IQR: interquartile range; MI: myocardial infarction

Findings: Significant differences were observed in hs-CRP levels, total cholesterol, and triglycerides, with all three parameters being markedly elevated in the group that failed to attain the LDL-C target ($p < 0.05$ for all). In contrast, no significant associations were found with MI phenotype (STEMI vs. NSTEMI) or the chosen revascularization strategy (PCI or CABG).

Table 6. Treatment characteristics between patients achieving and not achieving LDL-C target

Variable	Not achieving LDL-C target	Achieving LDL-C target	p-value
ACEI/ARB, n (%)	35 (87.50)	50 (94.34)	0.283[a]
Beta-blockers, n (%)	27 (67.50)	34 (64.15)	0.736[b]
Aspirin, n (%)	25 (62.50)	29 (54.72)	0.451[b]
Clopidogrel, n (%)	21 (52.50)	28 (52.83)	0.975[b]
Ticagrelor, n (%)	7 (17.50)	13 (24.53)	0.414[b]
Prasugrel, n (%)	1 (2.50)	0 (0)	0.430[a]
High-intensity statins, n (%)	32 (80.00)	31 (58.49)	**0.028**[b]
Ezetimibe, n (%)	23 (57.50)	29 (54.72)	0.789[b]
SGLT2i, n (%)	24 (60.00)	25 (47.17)	0.220[b]
Sacubitril/valsartan, n (%)	7 (17.50)	7 (13.21)	0.567[b]

a: Fisher's exact test; b: Chi-square test; ACEI: angiotensin-converting enzyme inhibitors; ARB: angiotensin receptor blockers; SGLT2i: sodium-glucose co-transporter 2 inhibitors

Findings: The use of high-intensity statins was significantly higher in the group not achieving the LDL-C target (80.0%) compared with the group achieving the target (58.49%), with p = 0.028. However, no statistically significant differences were observed between the two groups in the use of other medications, including beta-blockers, aspirin, clopidogrel, ticagrelor, prasugrel, ezetimibe, SGLT2i, and sacubitril/valsartan.

Univariate and multivariate logistic regression analyses

Table 7. Univariate and multivariate logistic regression analyses of factors associated with not achieving the hs-CRP target

Univariate logistic regressions				**Multivariate logistic regression**			
Variable	**OR**	**95% CI**	**p-value**	**Variable (multivariate)**	**OR**	**95% CI**	**p-value**
Sex	2.13	0.76 – 6.03	0.153	Sex	1.77	0.51 – 6.10	0.368
Age group	1.33	0.25 – 6.98	0.520	Obesity	0.60	0.19 – 1.87	0.378
Obesity	0.50	0.19 – 1.34	0.169	Heart failure	0.76	0.15 – 3.88	0.743
Smoking	1.38	0.53 – 3.55	0.510	Chronic kidney disease	2.97	0.77 – 11.43	0.114
Diabetes mellitus	1.56	0.60 – 4.06	0.367	LDL-C ≥ 70 mg/dL	2.47	0.81 – 7.52	0.113
Heart failure	2.07	0.78 – 5.49	0.146	ACEI/ARB	0.39	0.07 – 2.13	0.277
Chronic kidney disease	3.62	1.20 – 10.94	**0.023**	Clopidogrel	2.16	0.65 – 7.16	0.206
Atrial fibrillation	0.59	0.07 – 5.34	0.639	High-intensity statins	2.23	0.57 – 8.70	0.246
Stroke	1.02	0.10 – 10.27	0.990	Sacubitril/valsartan	2.94	0.45 – 19.28	0.261
MI phenotype	1.16	0.44 – 3.05	0.770	SGLT2i	1.48	0.44 – 4.92	0.525
Revascularization	1.23	0.24 – 6.37	0.970				
ACEI/ARB	0.29	0.07 – 1.26	0.100				

Beta-blockers	1.27	0.46 – 3.50	0.644
Aspirin	1.17	0.45 – 3.05	0.750
Clopidogrel	1.99	0.75 – 5.28	0.170
Ticagrelor	1.02	0.33 – 3.20	0.980
High-intensity statins	2.81	0.86 – 9.16	0.090
Ezetimibe	0.65	0.25 – 1.67	0.370
Sacubitril/valsartan	3.94	1.21 – 12.85	**0.020**
SGLT2i	1.99	0.75 – 5.28	0.170
LDL-C ≥ 70 mg/dL	3.38	1.26 – 9.06	**0.020**

OR: odds ratio; CI: confidence interval; ACEI: angiotensin-converting enzyme inhibitors; ARB: angiotensin receptor blockers; SGLT2i: sodium-glucose co-transporter 2 inhibitors; MI: myocardial infarction

Findings: In the univariate regression model, chronic kidney disease, use of sacubitril/valsartan, and failure to achieve the LDL-C target were predictors of not achieving the hs-CRP target ($p < 0.05$). In the multivariate regression model, no independent predictors of failure to achieve the hs-CRP target were identified.

Table 8. Univariate and multivariate logistic regression analyses of factors associated with not achieving the LDL-C target

Univariate logistic regressions				**Multivariate logistic regression**			
Variable	**OR**	**95% CI**	**p-value**	**Variable (multivariate)**	**OR**	**95% CI**	**p-value**
Sex	1.45	0.55 – 3.78	0.45	Diabetes mellitus	1.99	0.81 4.90	0.13
Age group	0.96	0.24 – 3.89	0.96	Chronic kidney disease	1.67	0.52 5.42	0.39
Obesity	0.71	0.31 – 1.63	0.42	High-intensity statins	2.34	0.85 6.42	0.10
Smoking	1.04	0.45 – 2.39	0.92	hs-CRP ≥ 2 mg/L	2.61	0.91 7.50	0.08
Diabetes mellitus	2.42	1.04 – 5.65	**0.041**				
Heart failure	1.67	0.69 – 4.05	0.26				
Chronic kidney disease	2.19	0.75 – 6.39	0.15				
Atrial fibrillation	2.83	0.49 – 16.31	0.24				
Stroke	1.34	0.18 – 9.96	0.77				
MI phenotype	1.30	0.55 – 3.03	0.55				
Revascularization	1.0	0.25 – 4.00	0.96				
ACEI/ARB	0.42	0.09 – 1.87	0.26				
Beta-blockers	1.16	0.49 – 2.76	0.74				
Aspirin	1.38	0.60 – 3.19	0.45				
Clopidogrel	0.99	0.43 – 2.25	0.99				
Ticagrelor	0.65	0.23 – 1.82	0.42				
High-intensity	2.84	1.10 – 7.33	**0.031**				

statins			
Ezetimibe	1.12	0.49 – 2.56	0.79
Sacubitril/valsartan	1.39	0.45 – 4.35	0.57
SGLT2i	1.68	0.73 – 3.86	0.22
hs-CRP ≥ 2 mg/L	3.38	1.26 – 9.06	**0.016**

OR: odds ratio; CI: confidence interval; ACEI: angiotensin-converting enzyme inhibitors; ARB: angiotensin receptor blockers; SGLT2i: sodium-glucose co-transporter 2 inhibitors; MI: myocardial infarction

Findings: In the univariate regression model, diabetes mellitus, use of high-intensity statins and hs-CRP ≥ 2 mg/L were significant predictors of not achieving the LDL-C target ($p < 0.05$). In the multivariate regression model, no independent predictors of failure to achieve the LDL-C target were identified.

Table 9. Univariate and multivariate logistic regression analyses of factors associated with failure to achieve both hs-CRP and LDL-C targets

Univariate logistic regressions				**Multivariate logistic regression**			
Variable	**OR**	**95% CI**	**p-value**	**Variable (multivariate)**	**OR**	**95% CI**	**p-value**
Sex	1.79	0.54 – 5.96	0.34	Diabetes mellitus	5.48	0.94 – 31.86	0.058
Age group	0.66	0.12 – 3.62	0.64	Chronic kidney disease	2.03	0.52 – 7.96	0.31
Obesity	0.70	0.23 – 2.16	0.54	ACEI/ARB	0.19	0.04 – 0.99	**0.048**
Smoking	1.73	0.57 – 5.26	0.33	Sacubitril/valsartan	1.41	0.32 – 6.17	0.65
Diabetes mellitus	7.58	1.60 – 35.87	**0.011**	SGLT2i	1.17	0.26 – 5.14	0.84
Heart failure	1.59	0.51 – 4.99	0.42				
Chronic kidney disease	2.75	0.80 – 9.48	0.11				
Atrial fibrillation	1.04	0.11 – 9.62	0.97				
Stroke	1.79	0.17 – 18.43	0.63				
MI phenotype	0.85	0.26 – 2.72	0.78				
Revascularization	0.67	0.13 – 3.59	0.64				
ACEI/ARB	0.15	0.03 – 0.68	**0.014**				
Beta-blockers	1.54	0.45 – 5.29	0.49				
Aspirin	1.55	0.48 – 4.95	0.46				
Clopidogrel	2.00	0.63 – 6.39	0.24				
Ticagrelor	0.51	0.11 – 2.49	0.41				
High-intensity statins	—	—	1.00				
Ezetimibe	0.88	0.29 –	0.83				

		2.68	
Sacubitril/valsartan	2.47	0.66 – 9.28	0.18
SGLT2i	2.90	0.85 – 9.88	0.09

OR: odds ratio; CI: confidence interval; ACEI: angiotensin-converting enzyme inhibitors; ARB: angiotensin receptor blockers; SGLT2i: sodium-glucose co-transporter 2 inhibitors; MI: myocardial infarction

Findings: In the multivariate regression model, only the use of ACEI/ARB was independently associated with the outcome, conferring an approximately 81% risk reduction compared with non-users. Diabetes mellitus demonstrated a trend toward a 5.5-fold increased risk despite not reaching statistical significance (p = 0.058). No other variables, including chronic kidney disease, sacubitril/valsartan, and SGLT2i, were significantly associated. In the univariate regression model, diabetes mellitus was a predictor of failure to achieve both hs-CRP and LDL-C targets (OR = 7.58, p = 0.011). Conversely, the use of ACEI/ARB was identified as a protective factor, reducing the risk of target failure (OR = 0.15, p = 0.014).

DISCUSSION

Our study of 93 patients after acute myocardial infarction (AMI) showed a mean age of 66.14 ± 10.14 years, comparable to the studies of Erin[1] et al. (64 ± 10) and Peikert[2] et al. Male patients accounted for 76.3%, concurs with international studies, reflecting gender-related differences in risk factors and comorbidities. The mean body mass index (BMI) was 24.49 ± 2.99 kg/m², significantly lower than that reported in international studies. This discrepancy may be attributable to differences in anthropometric characteristics and lifestyle factors between the Vietnamese population and other cohorts. The prevalence of smoking in our cohort was 41.9%, similar to Peikert[2] (40%) but lower than some other studies. Most patients had at least one comorbidity. Dyslipidemia and hypertension were the most common, with prevalences of 100% and 98.9%, respectively, substantially higher than in international studies, possibly due to differences in definitions or screening methods. The prevalence of diabetes mellitus (52.7%) was also higher. In terms of laboratory parameters, the median hs-CRP concentration was 0.80 [0.40–1.95] mg/L and the mean LDL-C concentration was 71.98 ± 30.02 mg/dL. Both values were lower than those reported in international studies, reflecting the effectiveness of risk factor control and treatment characteristics in Vietnam. The proportions of patients not achieving the hs-CRP target (≥ 2 mg/L), LDL-C target (≥ 70 mg/dL), and both targets were 24.73%, 43.01%, and 16.13%, respectively. These rates were markedly lower than in the studies of Peikert[2] and Mohammed[3] but comparable to Erin[1] et al for hs-CRP and the dual target. The relatively high rates of high-intensity statin use (67.7%) and ezetimibe co-prescription (55.9%) in our study may explain the favorable control of hs-CRP and LDL-C. Regression analysis showed no statistically significant associations between failure to achieve hs-CRP and LDL-C targets with age, sex, or BMI. However, diabetes mellitus was associated with a higher risk of not achieving the LDL-C target (OR 2.42; p = 0.039), consistent with Erin[1] et al., and particularly with failure to achieve both LDL-C and hs-CRP targets (OR 7.58; p = 0.011). This highlights the role of diabetes mellitus in residual risk factor control. In addition, sacubitril/valsartan use was associated with failure to achieve the hs-CRP target (OR 3.94; p = 0.02), possibly reflecting the relationship between heart failure and chronic inflammation. Failure to achieve the LDL-C target was associated with higher hs-CRP levels (p = 0.013), underscoring the interaction between inflammation and dyslipidemia. Conversely, the use of angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin receptor blockers (ARBs) was identified as an independent protective factor, reducing the risk of failing to achieve both targets (p = 0.048).

The limitations of this study include the relatively small sample size and the lack of longitudinal data on the predictive value of elevated hs-CRP for secondary cardiovascular events. In addition, sampling bias and group imbalance may have influenced regression analysis. Nevertheless, this study provides an overview of inflammation and cholesterol control among post-AMI patients in Vietnam, and

suggests future directions for monitoring and the potential role of anti-inflammatory therapies in secondary prevention.

CONCLUSION

A substantial proportion of Vietnamese post-AMI patients fail to achieve dual hs-CRP and LDL-C targets. Diabetes and chronic kidney disease are important predictors of residual risk, whereas ACEI/ARB therapy confers a protective effect. These findings underscore the need for intensified secondary prevention strategies addressing both lipid and inflammatory pathways.

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