CASE SERIES

https://doi.org/10.61910/ricm.v8i2.530

Analysis of cardiovascular risk stratification and achievement of LDL-cholesterol therapeutic targets in a public university hospital cardiology outpatient clinic

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HIGHLIGHTS

What is already known?

- Dyslipidemias are a significant cardiovascular risk factor.
- Statins are recommended for prevention of cardiovascular diseases.
- In Brazil, cardiovascular disease is the leading cause of mortality.

What was shown?

- 54% of the analyzed patients were classified as very high cardiovascular risk.
- 74% of the analyzed patients did not achieve the therapeutic goals.
- There was no change in medication for 91% of the cases analyzed.

How can the study aggregate to the literature?

- Analyzing the failure to achieve therapeutic goals for each risk level.
- This study emphasizes the importance of discussing therapeutic inertia.
- Few similar national studies exist on this topic.

ABSTRACT

Introduction: Cardiovascular risk stratification plays a crucial role in the early identification and effective prevention of adverse cardiovascular events. Clinical studies highlight statins as the primary therapy for reducing the incidence of cardiovascular events. **Objective:** To evaluate the adequacy of treatment for patients using statins according to therapeutic goals suggested by the cardiovascular risk calculator. **Method:** This is a retrospective study that analyzed medical records of patients undergoing statin treatment at a university cardiology outpatient clinic in a state capital between 2022 and 2023. Cardiovascular risk was calculated using the Brazilian Society of Cardiology tool, and the prescription was compared with the guidelines of the mentioned society to assess treatment compliance. **Results:** The sample consisted of 35 medical records. The majority were male (71%) with a mean age of 67 years. The most commonly used medication was simvastatin (51%) at 40 mg. The most prevalent comorbidity was hypertension (100%), and a sedentary lifestyle stood out (67%). Regarding cardiovascular risk, 54% had a very high risk, and 46% had a high risk. The mean LDL was 74, with most patients not meeting therapeutic goals (74%), and there was no change in medication for 91%. **Conclusion:** The findings of the study highlight the need for rigorous management strategies and adjustment of patients' LDL-C levels to the therapeutic goal in the studied cardiology outpatient clinic.

Keywords: Heart Disease Risk Factors; Cholesterol, LDL; Hospitals, University.

Abbreviations:

- Cardiovascular Disease (CVD)
- Coronary Artery Disease (CAD)
- Low-density Lipoprotein Cholesterol (LDL-c)
- Cardiovascular Risk (CVR)
- Framingham Risk Score (FRS)
- Atherosclerosis Department of the Brazilian Society of Cardiology (SBC-DA)
- High-density Lipoprotein (HDL-C)
- Research Ethics Committee (REC)
- Systemic Arterial Hypertension (SAH)
- Type 2 Diabetes Mellitus (T2DM)
- Acute Myocardial Infarction (AMI)
- Heart Failure (HF)
- Chronic Kidney Disease (CKD)
- Venous Thromboembolism (VTE)
- International Cholesterol Management Practices Study (ICLPS)
- Unified Health System (SUS)

INTRODUCTION

In brazil and worldwide, cardiovascular disease (cvd) is the leading cause of mortality, resulting in a significant increase in both morbidity and disability over the years.[1,2] approximately 20% of deaths in individuals over 30 years of age are attributed to cvd, whose high prevalence is correlated with insufficient control of risk factors[3].

The presence of classic risk factors such as hypertension, dyslipidemia, obesity, sedentary lifestyle, smoking, diabetes, and family history is fundamental in determining the risk of developing cvd, especially coronary artery disease (cad), thus guiding both primary and secondary prevention.[1,2] in addition to classic risk factors, various other aspects, such as sociodemographic, ethnic, cultural, dietary, and behavioral charac-

teristics play important roles in the variation of the cvd burden among populations and in their trends over time.[1,4]

Cardiovascular risk (cvr) stratification plays a fundamental role in the early identification and effective prevention of adverse cardiovascular events.[1,3] an acute coronary event often manifests as the first complication of atherosclerotic disease in approximately 50% of patients.1 in this sense, it is essential to identify asymptomatic individuals with a higher predisposition to establish appropriate therapeutic goals to mitigate risk.

To adequately estimate the severity of cvd, risk scores and algorithms based on regression analyses of population studies have been developed. These tools, such as the framingham risk score (frs), are fundamental to improving the identification of the global risk of cardiovascular events over a given period, usually estimated at 10 years.[1,3] the frs, adopted by the atherosclerosis department of the brazilian society of cardiology (sbc-da), provides a comprehensive estimate of events, including coronary, cerebrovascular, peripheral arterial disease, and heart failure[1]. This score estimates cvr based on the variables sex, age, systolic blood pressure, treatment for systemic hypertension, smoking, diabetes, high-density lipoprotein (hdl-c), and total cholesterol.[3]

The new cvr stratification proposed by the sbc-da classifies individuals into four distinct levels of cardiovascular risk: very high, high, intermediate, and low.[1,3] this stratified approach allows for a more targeted intervention, with the implementation of preventive and therapeutic measures appropriate to each risk category. Therefore, cvr stratification is a valuable tool in clinical practice, contributing significantly to the prevention and effective management of cardiovascular diseases.

Alterations in ldl-c levels are among the most critical modifiable risk factors for cardiovascular diseases, highlighting the importance of rigorous control to reduce events such as myocardial infarction and stroke.[7,8] indeed, there is ample evidence from genetic and clinical studies involving statins and other lipid-lowering drugs that demonstrates a direct correlation between lower levels of ldl-c and a proportional reduction in cardiovascular outcomes such as myocardial infarction, stroke, and cardiovascular death.[7,8,9,10] thus, the therapeutic goals to be achieved for lipid control are established according to the patient's risk stratification.

Statin therapy is widely supported by clinical studies as the most effective approach to reducing the incidence of cardiovascular events.[9,11] in addition, statins also have anti-inflammatory and other plaque-stabilizing effects.[2,12] supported by robust evidence, the use of statins remains the cornerstone strategy for primary and secondary prevention of cardiovascular events, offering significant benefits in lowering ldl cholesterol and cardiovascular risk. The magnitude of ldl-c reduction varies among different statins and is primarily related to the initial dose. Despite some differences in the potency of statins in studies, all of them have demonstrated the ability to reduce cardiovascular events and mortality in randomized clinical trials. [1,9,10.11]

Despite the role of dyslipidemias in the pathogenesis of atherosclerosis and cad being widely demonstrated in observational and experimental studies, therapeutic inertia and lack of adherence make it difficult for most patients to benefit from the proven benefits. Therefore, it is necessary to expand knowledge regarding the regular use of statins by achieving the therapeutic goals recommended for each patient. This type of study is important for monitoring general adherence to the medication as well as analyzing whether its therapeutic objective is being achieved. National studies on this topic have been growing in recent years due to the importance of this topic. Based on them, as well as on international studies, the objective of this study was to

evaluate whether the prescription of statins for patients in a university cardiology outpatient clinic is aligned with the therapeutic goals and treatment guidelines established by the brazilian society of cardiology.

METHOD

Study design

This is a retrospective cross-sectional study based on the analysis of medical records of patients undergoing statin therapy in a university cardiology outpatient clinic of the unified health system (sus) in a state capital. This study was approved by the local research ethics committee and is following resolution 466/12 of the national health council (caae: 70826023.4.0000.5134; approval number: 6.283.491).

This study interacts directly with a study on the comparative analysis of cvr levels and the achievement of therapeutic goals developed at the same institution, which aims to compare secondary care outpatient clinics in cardiology, endocrinology, and internal medicine. This global study is in production for investigation and comparative study among the aforementioned specialties. The present work prioritizes the cardiology outpatient clinic, which has as its principle the appropriate therapeutic approach to cardiovascular risk and its associated comorbidities.

Sample

This study included all patients aged 18 years or older who were taking statins and were seen in the cardiology specialty at a university outpatient clinic between 2022 and 2023. Patients whose medical records were missing or incomplete were excluded from the study. All participants were contacted by telephone using the contact information provided in their medical records. They were informed about the research and invited to provide written informed consent. A copy of the informed consent form was subsequently sent to participants via email.

A chi-square test was employed to calculate the required sample size. An effect size of 0.20 was set, with a significance level of 0.05 and a power of 80% with 3 degrees of freedom. Using g*power version 3.1.9.7, the estimated sample size was determined to be 246 patients. Following approval by the research ethics committee (rec), the calculated sample size was reallocated among the cardiology, internal medicine, and endocrinology specialties. The distribution of patients across these specialties was balanced, taking into account the estimated sample size for each specialty and the corresponding frequency of patient visits. This approach ensured that the number of patients included in each sample was proportional to the volume of patients seen in each specialty. Given that the internal medicine clinic had the highest volume of patient visits, a larger sample size was allocated to this specialty, followed by endocrinology and then cardiology. The minimum required sample size for the cardiology outpatient clinic was calculated to be 33 patients, and a total of 35 patients were ultimately included in the analysis.

Instruments

Medical records were reviewed, and data were collected on variables such as age, sex, the presence of cardiovascular risk factors, overall cardiovascular risk, history of cardiovascular events, ldl cholesterol levels, statin dosages, and the use of other lipid-lowering medications. Cardiovascular risk factors considered in this study included systemic hypertension, diabetes mellitus, alcohol consumption, smoking, physical inactivity, overweight or obesity, a history of coronary artery disease, previous acute myocardial infarction, heart failure, previous stroke, chronic kidney disease, venous thromboembolism, angina pectoris, previous coronary artery bypass graft surgery, and previous percutaneous transluminal coronary angioplasty. For patients who had multiple lipid profile measurements during the study year, the most recent result was utilized for analysis.

Procedures

The medical records were evaluated to collect demographic data, relevant personal history, cardiovascular risk factors, cardiovascular events, most up-to-date lipid profile, cardiovascular risk stratification, therapeutic goals, and medications in use. The cardiovascular risk of the patients was calculated based on the risk stratification of the sbc calculator to identify the clinical profile of the patient. Subsequently, the prescription was compared with sbc recommendations to determine treatment compliance. In this study, a systematic collection system with an interval of three medical records was used to ensure random and representative sampling of the population treated at the outpatient clinic.

Statistical analysis

To characterize the sample, simple frequency and percentage frequency were used to represent the qualitative variables. The chi-square test for independence was used on the variables to determine the level of association between the variables of interest. The wilcoxon rank sum test was used to detect the difference between the groups for quantitative variables that did not follow a normal distribution

RESULTS

TOf the 35 medical records evaluated, we found that most patients were male (71%) with an average age of 67 years. The most commonly used medication by patients was simvastatin (51%) at a dosage of 40 mg (61%), followed by rosuvastatin (26%) at 20 mg (67%) and atorvastatin (23%) at 40 mg (88%) (table 1).

Regarding comorbidities associated with dyslipidemia, the most prevalent was systemic arterial hypertension (sah) (100%), followed by overweight/obesity (80%), coronary artery disease (cad) (51%), type 2 diabetes mellitus (t2dm) (49%), previous acute myocardial infarction (ami) (40%), heart failure (hf) (26%), chronic kidney disease (ckd) (23%), previous stroke (17%), and vte ((2.9%). In terms of lifestyle habits, there was a predominance of sedentary lifestyle (67%) followed by alcoholism (24%) and active smoking (15%). Additionally, approximately 80% of the sample was overweight or obese.

Regarding the family history of cardiovascular diseases, most patients presented positive data regarding acute myocardial infarction (ami) or stroke (61%). Regarding cardiovascular risk, 54% of patients presented very high risk, while 46% presented high risk. Thus, we observed that no patient presented low or intermediate cardiovascular risk.

Regarding blood ldl levels, the average was 74, with the lowest average (61) being for patients using rosuvastatin and the highest (83) for those using atorvastatin. Patients using simvastatin had an average ldl of 76. Of these, 74% of patients were not at the therapeutic target and the vast majority (91%) did not undergo changes in the management of dyslipidemia after the tests were performed.

Table 1 presents all the data explained above in graphic form.

Table 1. Comorbidity Profile and Cardiovascular Risk of Patients on Statins in the Cardiology Outpatient Clinic.

Statins in Use				
Variables	Total, N = 35[1]	ATORVASTATIN, N = 8[1]	ROSUVASTATIN, N = 9[1]	SIMVASTATIN, N = 18[1]
Sex				
Masculine	10 (29%)	4 (50%)	2 (22%)	4 (22%)
Feminine	25 (71%)	4 (50%)	7 (78%)	14 (78%)
Age				
	67 (61, 78)	61 (55, 81)	64 (62, 72)	69 (67, 77)
Daily medication dose				
5mg	0 (0%)	0 (0%)	0 (0%)	0 (0%)
10mg	2 (5.7%)	0 (0%)	2 (22%)	0 (0%)
20mg	13 (37%)	0 (0%)	6 (67%)	7 (39%)
40mg	19 (54%)	7 (88%)	1 (11%)	11 (61%)
80mg	1 (2.9%)	1 (13%)	0 (0%)	0 (0%)
Use of another lipid-lowering agent				
No	30 (86%)	6 (75%)	6 (67%)	18 (100%)
Yes	5 (14%)	2 (25%)	3 (33%)	0 (0%)
Use of Fibrates				
No	35 (100%)	8 (100%)	9 (100%)	18 (100%)
Yes	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Use of Ezetimibe				
No	29 (83%)	6 (75%)	5 (56%)	18 (100%)
Yes	6 (17%)	2 (25%)	4 (44%)	0 (0%)
Use of iPCSK9[2]				
Yes	0%	-100%		
No	125%	128%	46%	-8%
Ignored	125%	78%	-75%	725%
Family history of AMI[3] or stroke				
No	11 (39%)	2 (50%)	2 (25%)	7 (44%)
Yes	17 (61%)	2 (50%)	6 (75%)	9 (56%)
SAH[4]				
No	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Yes	35 (100%)	8 (100%)	9 (100%)	18 (100%)
T2DM[5]				
No	18 (51%)	3 (38%)	5 (56%)	10 (56%)
Yes	17 (49%)	5 (63%)	4 (44%)	8 (44%)

Statins in Use				
Variables	Total, N = 35[1]	ATORVASTATIN, N = 8[1]	ROSUVASTATIN, N = 9[1]	SIMVASTATIN, N = 18[1]
Drinking				
No	26 (76%)	6 (75%)	8 (89%)	12 (71%)
Yes	8 (24%)	2 (25%)	1 (11%)	5 (29%)
Smoking				
No	29 (85%)	7 (88%)	9 (100%)	13 (76%)
Yes	5 (15%)	1 (13%)	0 (0%)	4 (24%)
Sedentary Lifestyle				
No	10 (33%)	2 (40%)	1 (11%)	7 (44%)
Yes	20 (67%)	3 (60%)	8 (89%)	9 (56%)
Overweight/Obesity				
No	2 (20%)	0 (0%)	1 (25%)	1 (25%)
Yes	8 (80%)	2 (100%)	3 (75%)	3 (75%)
Heart Failure				
No	26 (74%)	5 (63%)	6 (67%)	15 (83%)
Yes	9 (26%)	3 (38%)	3 (33%)	3 (17%)
CAD[6]				
No	17 (49%)	3 (38%)	1 (11%)	13 (72%)
Yes	18 (51%)	5 (63%)	8 (89%)	5 (28%)
Previous AMI				
No	21 (60%)	4 (50%)	2 (22%)	15 (83%)
Yes	14 (40%)	4 (50%)	7 (78%)	3 (17%)
Previous Stroke				
No	29 (83%)	5 (63%)	8 (89%)	16 (89%)
Yes	6 (17%)	3 (38%)	1 (11%)	2 (11%)
CKD[7]				
No	27 (77%)	7 (88%)	6 (67%)	14 (78%)
Yes	8 (23%)	1 (13%)	3 (33%)	4 (22%)
VTE[8] (DVT[9] and/or PE[10])				
No	34 (97%)	8 (100%)	9 (100%)	17 (94%)
Yes	1 (2.9%)	0 (0%)	0 (0%)	1 (5.6%)
Previous PTCA[11]				
No	26 (74%)	4 (50%)	6 (67%)	16 (89%)
Yes	9 (26%)	4 (50%)	3 (33%)	2 (11%)
Previous CABGS[12]				
No	30 (86%)	7 (88%)	8 (89%)	15 (83%)
Yes	5 (14%)	1 (13%)	1 (11%)	3 (17%)
Other previous cardiovascular procedure				
No	33 (94%)	8 (100%)	9 (100%)	16 (89%)
Yes	2 (5.7%)	0 (0%)	0 (0%)	2 (11%)

Statins in Use				
Variables	Total, N = 35[1]	ATORVASTATIN, N = 8[1]	ROSUVASTATIN, N = 9[1]	SIMVASTATIN, N = 18[1]
Cardiovascular Risk				
Low	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Intermediate	0 (0%)	0 (0%)	0 (0%)	0 (0%)
High	16 (46%)	2 (25%)	2 (22%)	12 (67%)
Very High	19 (54%)	6 (75%)	7 (78%)	6 (33%)
LDLc Level				
	74 (64, 107)	83 (72, 103)	61 (44, 83)	76 (67, 109)
Patients Meeting Therapeutic Target				
No	26 (74%)	8 (100%)	5 (56%)	13 (72%)
Yes	9 (26%)	0 (0%)	4 (44%)	5 (28%)
Change in management after laboratory tests				
No	32 (91%)	7 (88%)	9 (100%)	16 (89%)
Yes	3 (8.6%)	1 (13%)	0 (0%)	2 (11%)

1n (%); Median (AIQ)
iPCSK9[2]: inhibitor of proprotein convertase subtilisin/kexin type 9; **AMI**[3]: Acute Myocardial Infarction; **SAH**[4]: Systemic Arterial Hypertension; **T2DM**[5]: Type 2 Diabetes Mellitus; **CAD**[6]: Coronary Artery Disease; **CKD**[7]: Chronic Kidney Disease; VTE8: Venous Thromboembolism; DVT9: Deep Vein Thrombosis; **PE**[10]: Pulmonary Embolism; **PTCA**[11]: Percutaneous Transluminal Coronary Angioplasty; **CABGS**[12]: Coronary Artery Bypass Graft Surgery.

DISCUSSION

TIn the national literature, the epico study investigated the prevention of cardiovascular risk factors in brazilian public health. In this study, 7,724 participants from 322 primary healthcare units in 32 cities of the state of são paulo were invited to be interviewed. Overall, it was observed that 96.2% of the studied population was hypertensive, 78.8% diabetic, 78.8% were overweight and 54.3% were sedentary. Although the absolute value of the present sample is significantly smaller compared to the aforementioned study, the results on hypertension and overweight/obesity are similar in percentage to those found in this investigation (sah): 100% and overweight/obesity: 80%), while diabetes mellitus (49%) and sedentary lifestyle (67%) showed a higher percentage in this analysis. In epico, not only were ldl-c therapeutic goals analyzed, but also blood pressure and fasting glucose values were considered, which showed unfavorable results for the blood pressure and glycemic goals studied, reinforcing the lack of adequate control of more than one cardiovascular risk factor.[13]

Another relevant national research was conducted with 1,491 post-mi patients who attended in outpatient clinics in the public system of curitiba, which obtained results of a reduction of more than 50% of ldl-c in only 18.3% of cases after the cardiovascular event, being yet another demonstration of the failure to reach lipid goals.[14]

In the international literature, the eurika study, conducted with approximately 7,641 outpatient patients aged ≥50 years, without cardiovascular events and with at least one important risk factor for cvd, selected from 12 european countries, is emphasized. What was seen were the following results: 72.7% were hyper-

tensive, 57.7% had dyslipidemia, 26% were type 2 diabetics, 43.5% were obese and 19.8% were sedentary.[15] comparatively, in this study the percentage of all these risk factors mentioned proved to be significantly higher.

the euroaspire v study, inspired by the eurika study, was conducted based on interviews with approximately 2,759 patients from more than 16 different countries, mainly from eastern europe. The investigation was conducted with patients without previous cardiovascular events, but who were prescribed antihypertensive, hypoglycemic, and/or lipid-lowering medications in the last 6 months, and showed that 18.1% were smokers, 80.7% were overweight/obese, 39.1% were sedentary, 53% were hypertensive. It is noteworthy how hypertension is less prevalent in this study in comparison, while the other values are equivalent to those seen in the present study (active smoking 15%, sedentary lifestyle 67%, overweight/obesity 80%). It should be considered, however, that the study did not limit the sample to just one specialty.[16]

Another study, by comparison, is the international cholesterol management practices study (iclps) conducted in european countries excluding western ones, which had an average age of 61.4 years (standard deviation of 10 years) and a male predominance of 51.3% - in parallel, in this present research, an average age of 67 years and a male predominance of 71% were seen. Type 2 dm was seen in 96.9% of patients in the cited study and 67.8% were obese. Additionally, in this study above, 33.5% had cad, compared to the presence of cad in 51% of patients in this present work.[17]

Addressing cardiovascular risk, the prevalence of high (46%) and very high (54%) risk patients is noteworthy, reflecting a follow-up of patients with a more complex therapeutic management.

Regarding ldl levels, the average found was 74, with the highest average among atorvastatin patients, a statin considered high-potency, of 83 mg/dl. Comparatively, in a study also conducted at a university hospital in ribeirão preto, with 9,594 patients from 32 different specialties, the average ldl was measured at 94.6 ± 36.3 (mg/dl) in the cardiology outpatient clinic specifically17, in addition, the prescription was performed without aiming at a specific ldl-c target, without dose optimization or periodic monitoring of exams. Regarding the most used statin, simvastatin stands out in use by 18 patients, followed by 9 patients using rosuvastatin and 8 using atorvastatin. The dominant prescription of simvastatin can be explained by being a medication available in the unified health system (sus), while the other two statins are not available in the health posts of our municipality, which may interfere with continuous treatment adherence.

The predominance of prescriptions for simvastatin was also seen in the ribeirão preto study, which also addressed this issue from the point of view of widespread use due to availability in the public service, with a result of the presence of the medication in 77.6% of prescriptions.18 the cited study makes it clear how the use of other lipid-lowering agents, such as ezetimibe and pcsk9 inhibitors, are rarely seen due to not being available in the sus - in our study, only 17% used ezetimibe and no patient used pcsk9 or fibrate.

Despite the follow-up of these patients being carried out in a cardiology outpatient clinic, only 26% were at the ldl-c therapeutic target, and in 91% of cases there was no change in conduct regarding medication optimization. In parallel, it is observed how the percentage in this study is significantly low, a result similar to other research in dyslipidemic patients using statins: in epico, 13.9%13 was at the target; in eurika, 41.2%,15 in euroaspire v, 46.9%, 16 in the iclps

study, 43.9%.17 it is also noted how european studies achieved a higher percentage of target adequacy compared to brazilian studies, in this case, the present study and epico.

These results lead us to the discussion about therapeutic inertia (ti), that is, the failure to initiate or maintain a therapy, which can be multifactorial - clinical, socioeconomic, and related to the health system itself. Generally, ti is seen in cases of poor implementation or disagreement with guidelines, persistence in obsolete clinical practices, or fear of an aggressive reduction in ldl-c levels.19,20 on the other hand, one should also consider the possibility of poor patient adherence to treatment, an issue that is also not uncommon in outpatient care, which can lead to delayed medication optimization and continuation of treatment. Patients may underestimate cvr and the importance of using statins, as well as being afraid of adverse effects or not having the financial means, in the case of high-potency statins. Despite the complexity of this problem, discussions are still limited, but they already alert to the need for change and possible solutions to be implemented.20 the picture presented in this sample, therefore, is surprising and worrying regarding the follow-up and treatment of cardiovascular risk factors, with emphasis on dyslipidemias, in the cardiology outpatient clinic studied.

Finally, it is important to reiterate that this present work is correlated with a broader study on the comparative analysis of cardiovascular risk levels and therapeutic approaches among outpatient clinics specializing in cardiology, endocrinology, and internal medicine. The overall results will be addressed and deepened in a separate publication to promote a joint analysis of the data, while this article focuses on exposing the particularities of the cardiology outpatient clinic and its conduct regarding the approach to dyslipidemia.

Limitations

The present study has dyslipidemia as its primary focus; therefore, a limitation of this study is the lack of analysis of other components of the lipid profile, such as hdl, non-hdl cholesterol, and triglyceride levels. Undoubtedly, there is a need for additional research with larger sample sizes on dyslipidemia and other cardiovascular risk factors.

CONCLUSION

Risk stratification aims to optimize the personalization of therapeutic interventions, tailoring them to the individual needs of each patient and thus contributing to a more effective approach to preventing cardiovascular events. Based on the evaluation of 35 medical records, 74% of patients did not reach therapeutic targets, and the vast majority (91%) did not undergo changes in the management of dyslipidemia after laboratory tests.

These results highlight the importance of comprehensive strategies to manage dyslipidemia and cardiovascular risk factors, aiming to improve patient outcomes. Patients must achieve ldl-c therapeutic targets according to sbc guidelines, based on scientific evidence. Reaching these targets results in a substantial reduction in the risk of serious cardiovascular complications. Therefore, rigorous follow-up and measures to achieve targets are essential for the effective management of cardiovascular risk and the promotion of long-term cardiovascular health.

REFERENCES

1. Précoma db, de oliveira gmm, simão af, et al. Updated cardiovascular prevention guideline of the brazilian society of cardiology – 2019. Arquivos brasileiros de cardiologia. 2019;113(4):787-891. Doi:10.5935/abc.20190204

2. Chou r, dana t, blazina i, daeges m, jeanne tl. Statins for prevention of cardiovascular disease in adults: evidence report and systematic review for the us preventive services task force. Jama - journal of the american medical association. 2016;316(19):2008-2024. Doi:10.1001/jama.2015.15629

3. Garcia gt, de faria stamm amn, rosa ac, et al. Degree of agreement between cardiovascular risk stratification tools. Arquivos brasileiros de cardiologia. 2017;108(5):427-435. Doi:10.5935/abc.20170057

4. Mozaffarian d, micha r, peñalvo jl, cudhea f, & levitan eb. Dietary fats and cardiovascular disease: a presidential advisory from the american heart association. Circulation. 2020;141(6): e86-e93. Doi:10.1161/cir.0000000000000766.

5. Matos d, ferreira am, de araújo gonçalves p, et al. Coronary artery calcium scoring and cardiovascular risk reclassification in patients undergoing coronary computed tomography angiography. Revista portuguesa de cardiologia. 2021;40(1):25-30. Doi:10.1016/j.repc.2020.04.011.

6. Grundy sm, stone nj, bailey al, et al. 2018 aha/acc/aacvpr/aapa/abc/acpm/ada/ags/apha/aspc/nla/pcna guideline on the management of blood cholesterol: executive summary: a report of the american college of cardiology/american heart association task force on clinical practice guidelines. Journal of the american college of cardiology. 2019;73(24):3168-3209. Doi:10.1016/j.jacc.2018.11.002

7. Kaptoge s, pennells l, emberson j, et al. Cardiovascular risk factors and cardiovascular disease: a global perspective. Lancet. 2020;395(10228):103-112. Doi:10.1016/s0140-6736(19)32897-9.

8. Ference ba, ginsberg hn, graham i, et al. Low-density lipoproteins cause atherosclerotic cardiovascular disease. 1. Evidence from genetic, epidemiologic, and clinical studies. A consensus statement from the european atherosclerosis society consensus panel. European heart journal. 2017;38(32):2459-2472. Doi:10.1093/eurheartj/ehx144

9. Treatment trialists c. Articles efficacy and safety of more intensive lowering of ldl cholesterol: a meta-analysis of data from 170 000 participants in 26 randomised trials. Published online 2010. Doi:10.1016/s0140

10. Navarese ep, robinson jg, kowalewski m, et al. Association between baseline ldl-c level and total and cardiovascular mortality after ldl-c lowering a systematic review and meta-analysis. Jama - journal of the american medical association. 2018;319(15):1566-1579. Doi:10.1001/jama.2018.2525

11. Faludi aa, izar mco, saraiva jfk, chacra apm, bianco ht, afiune a, et al. Atualização da diretriz brasileira de dislipidemias e prevenção da aterosclerose – 2017. Arquivos brasileiros de cardiologia. 2017;109(2 supl 1):1–76.

12. Grundy sm, stone nj, bailey al, et al. 2019 acc/aha guideline on the management of blood cholesterol: executive summary. J am coll cardiol. 2020;73(24):3200-3226. Doi:10.1016/j.jacc.2018.11.002.

13. Fonseca har, izar mco, drager lf, et al. Primary prevention of cardiovascular disease at community clinics in the state of sao paulo, brazil: results from the epidemiological information study of communities. Global heart. 2023;18(1). Doi:10.5334/gh.1203

14. Bernardi a, olandoski m, erbano lo, guarita-souza lc, baena cp, faria-neto jr. Achievement of ldl-cholesterol goals after acute myocardial infarction: real-world data from the city of curitiba public health system. Arquivos brasileiros de cardiologia. 2022;118(6):1018-1025. Doi:10.36660/abc.20210328.

15. López-gonzález aa, rueda-sánchez g, marín-peñalver j, et al. Prevalence of cardiovascular risk factors and achievement of prevention targets in europe: the eurika study revisited. Eur heart j. 2023;44(7):637-645. Doi:10.1093/eurheartj/ehaa827.

16. Kotseva k, de backer g, de bacquer d, et al. Primary prevention efforts are poorly developed in people at high cardiovascular risk: a report from the european society of cardiology eurobservational research programme euroaspire v survey in 16 european countries. European journal of preventive cardiology. 2021;28(4):370-379. Doi:10.1177/2047487320908698

17. Blom dj, santos rd, daclin v, mercier f, ruiz aj, danchin n. The challenge of multiple cardiovascular risk factor control outside western europe: findings from the international cholesterol management practice study. European journal of preventive cardiology. 2020;27(13):1403-1411. Doi:10.1177/2047487319871735

18. 1Schmidt a, moreira ht, volpe gj, et al. Statins prescriptions and lipid levels in a tertiary public hospital. Arquivos brasileiros de cardiologia. 2021;116(4):736-741. Doi:10.36660/abc.20190513

19. 19. Dixon dl, sharma g, sandesara pb, et al. Therapeutic inertia in cardiovascular disease prevention: time to move the bar. Journal of the american college of cardiology. 2019;74(13):1728-1731. Doi:10.1016/j.jacc.2019.08.014

20. Cesena f. Achievement of ldl-cholesterol targets: why do we fail, and how can we improve? Arquivos brasileiros de cardiologia. 2022;118(6):1026-1027. Doi:10.36660/abc.20220288

THE AUTHORS DECLARE THAT THERE IS NO CONFLICT OF INTERESTS IN RELATION TO THIS ARTICLE.