



# Low Rate of Achieving LDL-Cholesterol Objective in a Low Income Population

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## OBJECTIVE

To assess the percentage of patients suitable to the objectives preconized by III Diretrizes sobre Dislipidemias da Sociedade Brasileira de Cardiologia (3rd Guidelines on Dyslipidemia of Brazilian Society of Cardiology), in a low income population. To determine whether there was a difference of that percentage in high risk patients, according to their age (<75 years old vs. ≥75 years old).

## METHODS

We analyzed, consecutively, 190 patients, divided in two groups: 51 low and middle risk patients (G I) and 139 high risk patients for coronary artery disease (G II). The sample was characterized by low income patients (69% for the patients had a family income between 1 and 2 minimum salaries), whose hypolipidemic therapy was irregularly supplied by the State.

## RESULTS

G I and G II showed, respectively,  $70.1 \pm 13.7$  years old and 13.7% of men and  $68.5 \pm 10.6$  years old and 62.6% of men. Among patients from G II, 30% showed LDL-cholesterol within the preconized objectives. The frequency of patients suitable to the objectives was significantly lower in individuals with 75 years of age or older than among those younger than 75 years old (16% vs. 30%,  $p=0.04$ ).

## CONCLUSION

In a predominantly low income population and without continuous assistance from the State to purchase statins, the achievement of preconized objectives for LDL-cholesterol, by 3rd Guidelines on Dyslipidemia of Brazilian Society of Cardiology, is low and also significantly lower among very old patients, with a high risk profile for atherosclerosis.

## KEY WORDS

coronary artery disease, dyslipidemia, LDL-cholesterol, hypolipidemic therapy

Cardiovascular diseases are the main mortality cause in Brazil, approximately around 25% of deaths, being responsible for about 250,000 deaths a year<sup>1</sup>. It is well demonstrated that plasma levels of cholesterol, especially LDL-cholesterol, its most atherogenic fraction, constitute important predictive factors of risk of coronary artery disease<sup>2</sup>. Similarly, it is a consensus that the indication of cholesterolemia reduction treatment in individuals with CAD history or of high future risk<sup>3</sup>. Such treatments can reduce the incidence of myocardial infarction and risk of death in 30%, approximately, in addition to other effects in morbid events, such as angina, cerebrovascular accidents, need for myocardial and peripheral revascularization procedures<sup>4,5</sup>. Due to new understandings, the 3<sup>rd</sup> Guidelines on Dyslipidemia of Brazilian Society of Cardiology (III DD-SBC) were published, then being stricter objectives instituted, especially in the control of LDL-cholesterol<sup>3</sup>. However, reaching such goals, especially in high risk CAD patients, requires medical and financial resources, which are not always available in public healthcare system. Moreover, the increase of life expectancy of the population and the consequent increase of the number of aged patients, with coronary artery disease, has required therapeutic decisions in even older patients. If, initially, intervention studies, in relation to hypercholesterolemia, a risk factor that keeps its importance in this group of patients<sup>6</sup>, excluded individuals over 65 years of age, currently large scope studies have evidenced the benefits of secondary prevention, at least up to 82 years of age<sup>7-10</sup>. In those studies, it was demonstrated that therapeutic intervention with statins was well tolerated by aged individuals and with even better results among those in a higher age range<sup>7,8,10</sup>. Therefore, our objective was to analyze which percentage of low income patients and without continuous assistance by the State to acquire pharmacological treatment, were suitable to preconized goals. Besides, to assess whether there was a difference between very aged individuals and the others, concerning achievement of goals.

## METHODS

It about a cross-section study on the lipidic profile of low and middle risk (G I) and high risk (G II) patients for coronary artery disease (CAD), seen at a SUS network school-hospital. The cardiology team is related to teaching and assistance. We also count on the support from a nutritionist for the elaboration of an individual diet. We consecutively analyzed 190 patients, divided in two groups (G I and G II), according to the calculation of Framingham risk score<sup>3</sup>. The characteristics of both groups are shown in table I. Lipidic profile was analyzed in the period from 4 to 6 months, after nutritional guidance and/or prescription of statins, which were not regularly supplied by such public hospital. Patients answered three questions related to their income and their attitude towards the need for purchasing indispensable

medications (chart I). Concerning economical conditions, 69% from the patients had a family income between 1 and 2 minimum salaries (fig. 1) and 74% reported that, despite knowing the medication could increase their life expectancy, they could not buy it. Besides, 79% said they went on without base cardiopathy treatment whenever medications ended before return.

Low risk patients are those whose absolute event risk is lower than 10% in 10 years: individuals with one risk factor (RF) for atherosclerotic disease (except diabetes), in addition to cholesterol (LDL-C >160 mg/dl). For that group, LDL-C goal to be achieved must be <130 mg/dl. However, and LDL-C up to 160 mg/dl is tolerable. The desired profile for such patients must be as follows: total cholesterol (TC) <200 mg/dl, HDL-C >40 mg/dl and triglycerides (TG) <150 mg/dl. Middle risk patients are the ones whose absolute event risk is >10%, however, lower than 20%: individuals with 2 RFs (except diabetes), in addition to cholesterol (LDL-C >160 mg/dl). For that group, the objective of LDL-C to be achieved must be <130 mg/dl and the desired lipidic profile is similar to the previous one. Those patients with event risk >20%, in 10 years, or >20%, by extrapolating the age to 60 years of life, individuals with more than 2 RF (except DM), in addition to cholesterol (LDL-C >160 mg/dl), diabetic, patients with coronary atherosclerotic disease or without it (aorta aneurysm, peripheral vascular failure or symptomatic cerebrovascular disease) and patients with genetic syndromes, such as family hypercholesterolemia and combined family hyperlipidemia, are categorized as high risk patients. LDL-C goal must be <100 mg/dl and the desired profile must be TC <200 mg/dl, HDL-C >40 mg/dl (HDL-C >45 mg/dl among diabetic patients) and TG <150 mg/dl.

Results from the values of triglycerides, total cholesterol, LDL-cholesterol and HDL-cholesterol were expressed through the mean and standard deviation. We applied the exact test of Fisher to calculate the difference of percentage of high risk patients for CAD, suitable to preconized objectives, according to age (<75 years old vs. ≥75 years old). Values of p <0.05 were regarded as statistically significant.

## RESULTS

The lipidic profile of the groups is described in table II. They showed LDL-cholesterol within established goals: 50.9% and 30.2% from the patients, respectively, from

**Table I - Number of patients and distribution according to sex and age, in low and middle risk groups and among those of high risk**

Characteristics	Number	Male sex (n) (%)	Age (years old)
Group I	51	7 (13.7%)	70.1±13.7
Group II	139	87 (62.6%)	68.5±10.6

**Chart I - Questions related to income and attitude towards the need for purchasing of indispensable medications**

1. What is your family income?
2. Knowing that the medication to decrease cholesterol level can increase your years of life and improve your life quality, and that it costs approximately thirty Brazilian reais a month, could you buy it?
3. What do you do when your heart medications finish before return? Do you buy them or stay without them?

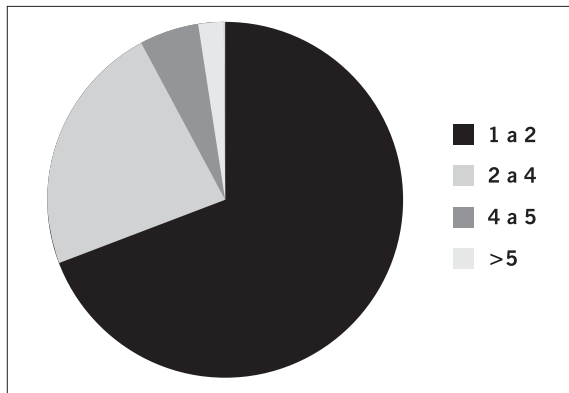


Fig. 1 - Family income (in minimum salaries) of the population under study.

groups I and II. The frequency of patients from group II (high risk), with 75 years of age or older, within the preconized goals of LDL-cholesterol, was significantly higher, when compared to patients younger than 75 years of age (16% vs. 30.2% p=0.04) (fig. 2).

**DISCUSSION**

This study demonstrated that most of our high risk and low income patients and, especially, the very old ones, are not achieving LDL-cholesterol goals, preconized by III DD-SBC. Concerning the very old ones, results can be justified because, until recently, we have not had consistent scientific evidences on the benefits in a population older than 75 years of age, as the intervention studies excluded aged patients over that age range<sup>4,7,8</sup>. However, currently, studies as the Heart Protection Study (HPS) and "PROSPER" demonstrated a reduction of mortality among high risk patients under use of statins,

at older ages<sup>9,10</sup>. The reduction of cardiovascular events was significant in both studies: 23.1% in simvastatin group vs. 32.3%, in placebo group, (p=0.002) and 14.1% in pravastatin group vs. 16.2%, in placebo group (p=0.01), respectively. Such studies emphasize the need for increase the use of statins with the aim of achieving the preconized goals, which were less achieved in that age range.

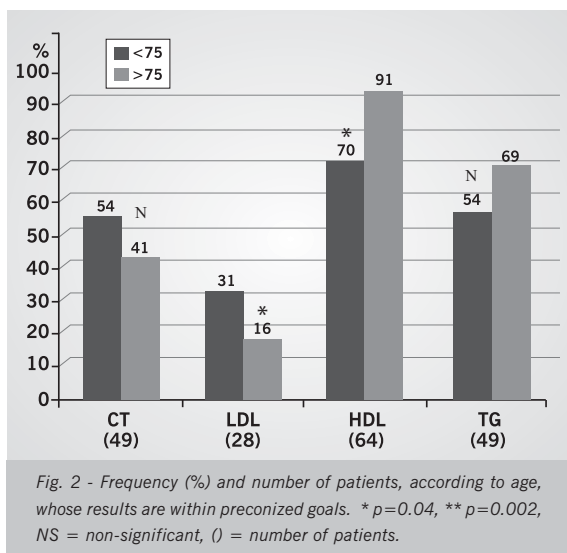
When we analyze results from literature, we noticed that the difficulty of reaching preconized goals is a problem observed in other centers. The multicenter study L-TAP (The Lipid Treatment Assessment Project), carried out in 5 regions in the United States, assessed 4,888 patients under the use of hypolipidemic therapy for, at least, 3 months. Among those, 77% were high risk patients for future cardiovascular events. Despite such study has been carried out in a population with higher socioeconomic conditions than ours, only 37% from high risk individuals showed LDL-cholesterol equal or lower than 100mg/dl<sup>11</sup>. Allison et al. reported similar results: 39% from high risk patients achieved the LDL-cholesterol control goal, after hygiene-dietary guidance and, if necessary, the use of hypolipidemic medications. In this study, the pharmacological treatment was the most important independent factor to achieve the objective of LDL-cholesterol  $\leq 100\text{mg/dl}$ <sup>12</sup>.

We observed that our patients have not reached the control preconized goals of LDL-cholesterol either, possibly due to the low compliance with the preconized treatment, either represented by the change in lifestyle or by pharmacological treatment. The latter, influenced by the high cost of medication, for that population with scarce financial resources. We observed that despite of risk awareness for future cardiovascular events, patients did not purchased the medications. And those, whenever offered by the hospital pharmacy, were not continued, in case they finished before the return to the appointment. The compliance or not with the treatment depends on many factors related or not to the patient's will. One of those factors is the improper communication between healthcare professionals and the patients, by making him/her be unable to follow medical recommendations, a clearer fact among aged or little literate patients, although the main limiting factor of the chronic use is the cost of medications<sup>13</sup>. Mansur et al. analyzed 207 patients with CAD and dyslipidemia diagnosis. From 139 patients who

**Table II - Lipidic profile (mean and standard deviation) and the achievement rate of preconized goals by SBC, according to the risk level for CAD**

Variable	Total Cholesterol		HDL- Cholesterol		LDL- Cholesterol		Triglycerides	
	Mean	Rate	%	Rate	Mean	%	Mean	%
G I	221.5±39.8	41.2%	53.3±13.5	94.1%	129.9±31.9	50.9%	127.0±57.2	76.5%
G II	205.2±42.6	55.3%	49.1±13.1	77.7%	125.5±34.5	30.2%	161.3±106	61.8%

*Mean = values expressed in mg/dl; followed by the standard deviation and rate = percentage of patients suitable to values proposed by III Diretrizes sobre Dislipidemias and Diretriz de Prevenção de Aterosclerose (Atherosclerosis Prevention Guideline)<sup>3</sup>.*



received the statin prescription, 85 (61%) made regular use of the medication. From those 54 (39%) individuals who used it irregularly, 36 (67%) reported that the price of the medication was the main responsible for the irregularity of the treatment<sup>13</sup>. For that reason, State participation is fundamental to assure the suitable control of the lipidic profile in low income patients, not only through human resources, represented by the

multidisciplinary team, but also by providing the medication uninterruptedly.

In December 2002, the Governmental Decree No. 1.015 was signed, approving the Protocolo Clínico e Diretrizes Terapêuticas para Dislipidemias (Clinical Protocol and Therapeutic Guidelines for Dyslipidemias), of national character, which are going to be used by Health Secretariats in the regulation of exemption of medications foreseen in it (statins, fibrates and nicotinic acid)<sup>14</sup>. We believe that, with those measures and the understanding that the use of such medications is responsible for mortality reduction, even in very aged individuals, we are able to reduce the incidence of cardiovascular events in a high risk population.

The main limitation in relation to this study is the low number of participants to generalize the results for low income population in our country, although, unfortunately, that may seem to be a reality. Similarly, the comparison with other studies, which assessed the compliance to the objectives, is precarious due to the low number of individuals studied in the present work. However, our results may give rise to the interest in new research, with a greater number of participants, to measure the accomplishment of preconized goals and, then, influence the management of professionals connected to the area, as well as the State, in order to warrant the proper supplying of medications.

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