Prescription and Adherence to Statins of Patients with Coronary Artery Disease and Hypercholesterolemia

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Objective - *Statins have proved to be safe and effective in the secondary prevention of coronary artery disease, but the level of prescription and the reasons for nonadherence to treatment in many coronariopathy treatment centers has not been determined. The purpose of this study was to identify reasons for nonadherence to statin therapy.*

Methods - *We analyzed 207 consecutive patients with coronary artery disease and hypercholesterolemia (total cholesterol $\geq$200mg/dL or LDL – cholesterol $\geq$130mg/dL). Patients' average age was 61.7±10 year; 111 (53.6%) male were and 94 (46.6%) were female. We analyzed the level of prescription and adherence to treatment with statins.*

Results - *Statins were prescribed for 139 (67%) patients, but only 85 (41%) used the drug. In spite of being indicated, statins were not prescribed in 68 (33%) patients. Of 54 (26%) patients, nonadherent to statins, 67% did not use the drug due to its high cost, 31% due to the lack of instruction, and only 2% due to side effects. Total cholesterol (260.3±42.2 vs 226.4±51.9; p<0.0001) and LDL cholesterol (174.6±38.1 vs 149.6±36.1; p<0.0001) were lower in patients on medication. HDL–cholesterol increased from 37.6±9.6 to 41.5±12.9mg/dL (p=0.02), and triglycerides were not modified in patients using statins.*

Conclusion - *The prescription of statins in patients with coronary artery disease and dyslipidemia is high; however, its adherence is far from satisfactory, due to the high cost of the medication. Reduction in total cholesterol and LDL cholesterol levels did not reach the targets recommended by the Brazilian Consensus on Dyslipidemia.*

Key words: coronary artery disease, hypercholesterolemia, statins, adherence.

Chronic diseases, such as arteriosclerosis, dyslipidemia, systemic arterial hypertension, and diabetes require prolonged clinical treatment, in most cases, for one's total life span. The patients with these diseases respond very well to nonpharmacological treatment, usually, dietary reorientation and adequate physical activity. However, in some patients, the addition of pharmacological treatment is necessary [1,2]. The medication is frequently used for a long period of time, when no side effects are observed. Although aware of the importance of the prescribed medication, many patients do not use it or use it irregularly [3-6]. This behavior is more noticeable in the aforementioned chronic diseases, because usually they are not associated with restricting acute symptoms. They are diseases that appear after long periods of exposure to noxious environmental influences. This problem is a fact for coronary heart disease patients as they live with a chronic problem, frequently associated with other known-risk factors for coronary heart disease [7,8]. As such, these patients should undergo appropriate pharmacological treatment, many times taking more than one medication. However, the prescription by physicians and the adherence to medication by coronary heart disease patients, followed up in terciary health care centers are unknown, as are the reasons that lead patients to nonadherence to the proposed treatment. This study chose hypercholesterolemia and pharmacological treatment with statins to analyze the level of prescription by physicians and the adherence of patients to this class of medication in a quaternary cardiology health care clinic.

Methods

We analyzed prospectively two hundred seven consecutive patients from the Coronariopathy Unit at the Heart Institute, Medical School, University of São Paulo (InCor). All patients with coronary heart disease and dyslipidemia (total cholesterol >200mg/dL or LDL-cholesterol >130mg/dL and triglycerides <400mg/dL) from March to June '98 were included. Average age was from 28-83 years (mean ± SD; 61.7±10) years; 111 (53.6%) were males and 96 (46.4%) were

females. Coronary heart disease diagnosis was obtained by angiography and defined as atherosclerotic lesions with over 50% occlusion in at least 1 epicardial coronary artery.

Tabagism, systemic arterial hypertension (diastolic arterial pressure $\geq$90mmHg) [9], and diabetes (glycemia >126mg/dL) [10] were prevalent. For diagnosis of hypercholesterolemia, total cholesterol values of $\geq$200mg/dL or LDL cholesterol of $\geq$130mg/dL were used. Hypercholesterolemia was the risk factor selected for this study- because 1) it is a chronic disease that in most cases is diagnosed in the laboratory, 2) it rarely causes symptoms that may influence conduct, 3) changes in its conduct are usually verified via blood tests, 4) it responds adequately to treatment that takes a few weeks, 5) it can be treated efficiently and safely with statins, 6) treatment with the regular use of medication is associated with significant lowering of cholesterol levels.

The level of prescription and adherence to statins by patients were analyzed according to the Brazilian Consensus on Dyslipidemia [11]. Nonadherence was classified as 1) lack of understanding by patients of the physician's instructions for taking the medication, for example use the statins for only a month, take the statins on alternate days, stop taking the statin after normalization of the cholesterol levels, among other things, 2) due to side effects, considering all those described for the medication, 3) nonutilization of the medication, in spite of having the prescription. In this case, the motives were questioned.

Serum triglyceride levels, total cholesterol, HDL–cholesterol, and LDL –cholesterol were analyzed in all patients, before and after the prescription or nonprescription of statins, average of 6.1±1.4 months.

The statistical analysis was performed with the chi-square test for categorical variables and the Student's *t* test for analysis of fractions that compose the lipid profile. Statistically significant values were p <0.05.

Results

The clinical characteristics of patients are provided in Table I. Statins were prescribed for 139 (67%) patients. Simvastatin, atorvastatin, and pravastatin were prescribed, respectively, for 72%, 21%, and 7% of the patients who received a prescription. Eighty-five (41%) took the medication regularly, while the remaining 122 (59%) did not take the medication or took it irregularly. In 68 (33%) patients, in spite of being indicated, statins were not prescribed. Irregular use of the medication was observed in 54 (26%) of patients (fig.1). In these patients, the cost of the medication was mainly responsible for nonadherence; in 17 (31%) it was due to lack of proper instruction on the use of the drug, and in 1 (2%) it was due to side effects, in particular myalgia. Total cholesterol was lowered from 260.3±42.2 to 226.4±51.9mg/dL (p<0.0001) and LDL cholesterol from 174.6±38.1 to 149.6±36.1mg/dL (p<0.0001) in patients who used statins regularly. HDL–cholesterol increased from 37.6±9.6 to 41.5±12.9 mg/dL (p+0.02), and triglycerides were not modified in patients using statins. Serum triglyceride levels,

total cholesterol, HDL–cholesterol, and LDL cholesterol were similar in groups of patients who did not use the medication or who used it irregularly (Table II).

Discussion

Prescription of statins in hypercholesterolemia treatment was effective in practically 70% of patients with coronary heart disease, which shows the awareness of attending physicians of the need to control this risk factor, selected for analysis of adherence in this study. However, for a significant number of patients, this knowledge was not transmitted adequately. This information should be better explained to the patient by the health worker, not necessarily by the

Table I – Clinical characteristics of patients adherent or nonadherent to statins.

N (207)	Adherent(85)	Nonadherent (122)
Age (year)	60.4±9.8	61±11
Gender (M/F)*	36 / 33	74 / 64
Tabagism	27 (32%)	43 (35%)
SAH	44 (52%)	61 (50%)
Diabetes mellitus	15 (17%)	13 (16%)
Triglyceride(mg/dl)	222.1±58.2	232±64,4
Total cholestero (mg/dl)	260.3±42.2	245.6±55.3
HDL – cholesterol (mg/dl)	37.6±9.6	38.3±8.6
LDL - cholesterol (mg/dl)	174.6±38.1	176.2±31

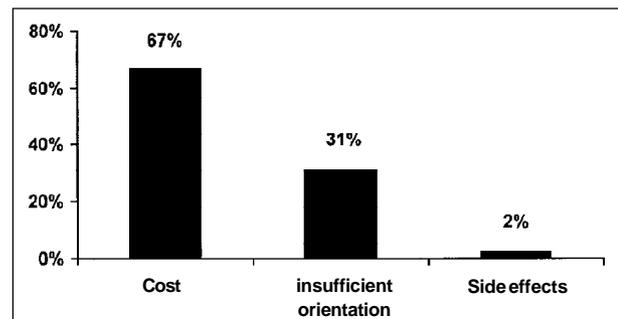M- male; F- female; SAH- systemic arterial hypertension.

Figure 1 – Motives for patient nonadherence to statins

Table II – Lipid profile of patient adherent or nonadherent to statins

Adherent (N=85)	Initial	Final	p
Triglyceride(mg/dl)	222.1±58.2	218.2±48.6	0.636
Total cholesterol (mg/dl)	260.3±42.2	226.4±51.9	<0.0001
HDL – cholesterol (mg/dl)	37.6±9.6	41.5±12.9	0.027
LDL-cholesterol (mg/dl)	174.6±38.1	149.6±36.1	<0.0001
Non-adherent (N=122)			
Triglyceride(mg/dl)	232±55.3	229±72.5	0.717
Total cholesterol (mg/dl)	245.6±55.3	246.3±49	0.917
HDL cholesterol (mg/dl)	38.3±8.6	38.6±10.1	0.803
LDL cholesterol (mg/dl)	176.2±31	179.4±39.2	0.480

physician. Nurses, nutritionists, and pharmacists are examples of health workers who can also satisfactorily transmit information to improve patient adherence in the control of risk factors[12,13]. This, because chronic diseases are associated with more complex variables that interfere with patients' adherence to treatment, and often patients have doubts about their own understanding of the meaning of "coronary disease", of risk factors, of the necessity for long-term treatment, of the cost-benefit relation ratio of the treatment, and other things. Lack of information favors nonadherence to treatment and can stimulate the patient to try unconventional or nonevidence-based therapeutics. To avoid these problems, information transmitted to patients should be clear and objective, which is not always possible for the physician. Reasons for this situation transcends the scientific language and the physician-patient relationship, the latter more and more affected by the physicians' actual work situation. In this study, patient nonadherence due to side effects was very low and similar to the prevalence observed in some multicenter studies. It is known that statins are efficient and safe. The most frequent side effects are the increase of liver enzymes and myalgia[14]. However in this study, the most important factor of patient nonadherence to statins was the cost of statins, a problem also observed in other countries[15-17]. This fact is extremely important as it is known that the use of these medications reduces the prevalence of new cardiovascular events, as much in primary as in secondary prevention[18]. In coronary heart disease patients, a further reduction in serum levels of LDL cholesterol, to less than 100mg/dL[11] has been proposed. It is also known that for patients with stable coronary heart disease, besides statins, acetylsalicylic acid and beta-blockers are other medications that reduce morbidity and mortality, and these latter 2 medications are more reasonably priced for our population, thus promote better adherence. So that prescription of this triad of medications becomes a reality, urgent discussions regarding the price of statins is are necessary. Because cardiovascular diseases, ischemia, and stroke are the main causes of death in the Brazilian population, they are important public health issues.

Adherence to treatment depends on various factors related or not to patients' wishes. One of these factors of nonadherence is the inadequate communication between health care workers and patients, resulting in the patient's incapabilit of following medical recommendations, a fact more evident in older or semiilliterate patients[19]. However, the main restricting factor of chronic or long-term use is the cost of the medication.

It is important to note that, in spite of reductions in serum cholesterol and serum LDL–cholesterol levels, as an average, the levels recommended by the Brazilian Consensus on Dyslipidemia were not reached. To reach these goals in the long-term would signify a decrease in morbidity and mortality due to cardiovascular diseases in the population under study.

Other risk factors, such as arterial hypertension and diabetes, were not selected for this study, as they are potentially unstable diseases and could require alterations or changes in medications therefore causing increased side effects and decreased adherence. A global analysis of adherence, from a medical or socioeconomic point of view, would be affected.

In conclusion, the prevalence of the prescription of statins for patients with coronary heart disease and dyslipidemia is high, suggesting recognition, by the medical community of the drug's efficiency. In spite of the ample prescription of statins, adherence to their use is still far from satisfactory, mainly due to the high cost of the medication. At the same time, the reduction in total cholesterol and LDL-cholesterol did not reach the levels recommended by the Brazilian Consensus on Dyslipidemia.

Acknowledgements

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