Clin Investig Arterioscler. 2017;29(1):7–12

Sociedad Española de Arteriosclerosis

CLÍNICA E INVESTIGACIÓN EN ARTERIOSCLEROSIS

www.elsevier.es/arterio

ORIGINAL ARTICLE

Statin associated myopathy in clinical practice. Results of DAMA study☆

Jesús Millán[a,*], **Juan Pedro-Botet**[b], **Elisenda Climent**[b], **Joaquín Millán**[a], **Joan Rius**[c]

[a] *Unidad de Lípidos, Hospital Universitario Gregorio Marañón, Universidad Complutense, Madrid, Spain*
[b] *Unidad de Lípidos y Riesgo Vascular, Servicio de Endocrinología y Nutrición, Hospital del Mar, Universidad Autónoma de Barcelona, Barcelona, Spain*
[c] *Asesor Médico Cardiovascular, Medicina Familiar y Comunitaria, Barcelona, Spain*

Received 18 May 2016; accepted 6 July 2016
Available online 1 February 2017

KEYWORDS
Statins;
Statin intolerance;
Myalgia;
Myopathy;
Myositis;
Muscle symptoms

Abstract
Background and objective: Muscle symptoms, with or without elevation of creatine kinase are one of the main adverse effects of statin therapy, a fact that sometimes limits their use. The aim of this study was to evaluate the clinical characteristics of patients treated with statins who have complained muscle symptoms and to identify possible predictive factors.
Patients and methods: A cross-sectional one-visit, non-interventional, national multicenter study including patients of both sexes over 18 years of age referred for past or present muscle symptoms associated with statin therapy was conducted. 3845 patients were recruited from a one-day record from 2001 physicians.
Results: Myalgia was present in 78.2% of patients included in the study, myositis in 19.3%, and rhabdomyolysis in 2.5%. Patients reported muscle pain in 77.5% of statin-treated individuals, general weakness 42.7%, and cramps 28.1%. Kidney failure, intense physical exercise, alcohol consumption (>30 g/d in men and 20 g/d in women) and abdominal obesity were the clinical situations associated with statin myopathy.

☆ Please cite this article as: Millán J, Pedro-Botet J, Climent E, Millán J, Rius J. Miopatía asociada al uso de estatinas en la práctica clínica. Resultados del estudio DAMA. Clin Invest Arterioscler. 2017;29:7–12.

* Corresponding author.
E-mail address: jesus.millan.nunezcortes@madrid.org (J. Millán).

Conclusions: Myalgia followed by myositis are the most frequent statin-related side effects. It should be recommended control environmental factors such as intense exercise and alcohol intake as well as abdominal obesity and renal function of the patient treated with statins.

PALABRAS CLAVE
Estatinas;
Intolerancia a estatinas;
Mialgia;
Miopatía;
Miositis;
Síntomas musculares

Miopatía asociada al uso de estatinas en la práctica clínica. Resultados del estudio DAMA

Resumen
Antecedentes y objetivo: Los síntomas musculares, con o sin elevación de creatincinasa, son uno de los principales efectos adversos del tratamiento con estatinas, hecho que en ocasiones limita su uso. El objetivo del presente estudio ha sido evaluar las características clínicas de los pacientes tratados con estatinas que han presentado síntomas musculares, e identificar los posibles factores predictores.
Pacientes y métodos: Estudio transversal de una sola visita, no intervencional, multicéntrico nacional, que incluyó pacientes de ambos sexos mayores de 18 años de edad que habían presentado o presentaban síntomas musculares asociados a la terapia con estatinas. Participaron 2.001 médicos que aportaron los datos clínicos de un total de 3.845 pacientes.
Resultados: La mialgia estuvo presente en el 78,2% de los pacientes incluidos en el estudio, la miositis en un 19,3% y la rabdomiólisis en el 2,5%. Los pacientes refirieron dolor muscular en el 77,5% de los casos, debilidad general en el 42,7% y calambres en el 28,1%. La insuficiencia renal, el ejercicio físico intenso, el consumo de alcohol (>30 g/d en varón y 20 g/d en mujer) y la obesidad abdominal fueron las situaciones clínicas asociadas con la miopatía por estatinas.
Conclusiones: La mialgia seguida de la miositis son los efectos musculares más frecuentes relacionados con el uso de estatinas. Debe recomendarse el control de factores ambientales como el ejercicio físico intenso y la ingesta alcohólica, así como la obesidad abdominal y la función renal del paciente tratado con estatinas.

Introduction

Statins form part of the basic pharmacological approach in cardiovascular prevention[1] and have an excellent safety profile. They are, however, not free of undesirable effects,[2] and muscular disorders with or without creatinine (CK) elevation must be considered and monitored.[3] Muscular symptoms associated with statin therapy present variable incidence rates and can be the cause of a loss of adherence or discontinuity of treatment in two thirds of all cases in the first two years of treatment,[4–7] resulting in a significant loss of cardiovascular prevention.[8]

The clinical spectrum of muscular symptoms is broad and includes muscle pain, stiffness or cramps. They are often referred to as ''myalgia'' and are usually symmetrical, although they can be localised, occasionally accompanied by loss of strength and usually without CK elevation. In randomised clinical studies, myalgia is usually present in 1–5%,[9–11] but observational studies show that it tends to be more common in clinical practice. In the study entitled *Effects of Statins on Muscle Performance* (STOMP), muscular symptoms were found in 9.4% of the cases treated with 80 mg of atorvastatin and only in 4.6% of the placebo group.[12] In the PRIMO study, an observational study in around 8,000 dyslipidaemia patients treated as outpatients with high doses of statins, 10.5% presented muscular symptoms, with muscle pain being the main obstacle to the conduct of even moderate normal activities.[13] Muscle pain also tends to be the most commonly described symptom in patients during the first month of pharmacological treatment.[14]

However, 90% of patients with muscular problems apparently associated with treatment with a specific statin are capable of tolerating a different statin. This suggests that the problem cannot be generally attributed to all statins, or that it may have multiple causes.[7] This study, entitled Defining the Onset of Statin-associated Myopathy (DAMA), was conducted to evaluate the clinical characteristics of patients treated with statins who presented muscular symptoms, and to identify possible predictive factors.

Patients and methods

The DAMA study is a cross-sectional, one-visit, non-interventional, national, multi-centre study including patients of both sexes over 18 years of age with past or present muscle symptoms associated with statin therapy. The study was approved by the Ethics Committee of the Institute Hospital del Mar d'Investigacions Mèdiques. The researchers followed the principles of the Declaration of Helsinki, and SOPs ensured compliance with Good Clinical