



ARCHIVOS DE LA SOCIEDAD ESPAÑOLA DE OFTALMOLOGÍA

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Original article

Bibliometric analysis of the scientific production as regards statin use for ophthalmological symptoms of myasthenia gravis[☆]

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ARTICLE INFO

Article history:

Received 14 November 2016

Accepted 25 January 2017

Available online xxx

Keywords:

Myasthenia gravis

Statins

Ophthalmological manifestations

Bibliometry

ABSTRACT

Introduction: The first symptoms of myasthenia gravis (MG) usually involve weakness of the ocular muscles, making it relevant that ophthalmologists have updated information on studies as regards its relationship with the consumption of drugs, such as statins.

Materials and methods: A bibliometric analysis was performed using the Scopus database and by a search strategy in the selection of documents containing descriptors related to statins in the «Title» («TI») field and the descriptors «ophthalm *», «myast *», «visual *» in other fields of the document (period 1986–2015).

Results: The results showed that, while the number of scientific publications on ocular effects of statins has grown linearly ($n = 838$; $y = 2.267x - 4507.1$; $r = 0.7221$; time of duplication: 4.66 years, and rate of annual growth: 50.06%), the specific publications about MG have experienced an exponential growth ($n = 38$; $y = 2E - 262e^{0.3001x}$; $r = 0.3892$; time of duplication: 2.95 years, and rate of annual growth: 46.25%) without reaching the saturation postulated in Price theory of the expansion of the scientific literature. The majority of publications relating to MG are reports of cases linked to a worsening of the MG symptoms, and simvastatin and atorvastatin are the agents mentioned in most of the publications.

Conclusions: These results should enable ophthalmologists to expand their knowledge concerning the evolution of studies on statins and MG, pointing out the relevance of such causal relationships.

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[☆] Please cite this article as: Salado-Font SM, López-Muñoz F, Povedano-Montero FJ, Labella Quesada F. Análisis bibliométrico de la producción científica sobre el efecto del consumo de estatinas en las manifestaciones oftalmológicas de la miastenia gravis. Arch Soc Esp Oftalmol. 2017. <http://dx.doi.org/10.1016/j.oftal.2017.01.011>

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Análisis bibliométrico de la producción científica sobre el efecto del consumo de estatinas en las manifestaciones oftalmológicas de la miastenia gravis

R E S U M E N

Palabras clave:

Miastenia gravis

Estatinas

Manifestaciones oftalmológicas

Bibliometría

Introducción: Los pacientes con miastenia gravis (MG) suelen empezar con afectación de la musculatura ocular. Es relevante que el oftalmólogo disponga de información actualizada del estado de la investigación respecto a la relación de esta enfermedad con el consumo de fármacos, como las estatinas.

Material y métodos: Se realizó un análisis bibliométrico, utilizando la base de datos Scopus y aplicando una estrategia de búsqueda consistente en la selección de documentos que contuvieran los descriptores referidos a estatinas en el campo «Título» («TI») y los descriptores «ophthalm*», «myast*», «visual*» en cualquier otro campo del documento (de 1986 a 2015).

Resultados: Los resultados confirman que, mientras el número de publicaciones científicas sobre efectos oftalmológicos de las estatinas ha crecido linealmente ($n=838$; $y=2,267x-4507,1$; $r=0,7221$; tiempo de duplicación: 4,66 años y tasa de crecimiento anual: 50,06%), las publicaciones específicas sobre MG han experimentado un crecimiento exponencial ($n=38$; $y=2E-262e^{0,3001x}$; $r=0,3892$; tiempo de duplicación: 2,95 años y tasa de crecimiento anual: 46,25%), sin que se haya alcanzado la saturación postulada en la teoría de Price de la expansión de la literatura científica. La mayor parte de las publicaciones relativas a la MG son reportes de casos vinculados a un empeoramiento de la sintomatología de la MG, y los agentes que más publicaciones aportan son simvastatina y atorvastatina.

Conclusiones: Estos resultados permitirán al oftalmólogo ampliar su conocimiento respecto a la evolución de la investigación sobre estatinas y MG y reflejan un interés creciente por la relación entre el consumo de ambas, señal de la relevancia de dicha relación causal.

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Introduction

Myasthenia gravis (MG) is an infrequent malady with a worldwide prevalence estimated at 15–179 per million inhabitants.¹ MG is a self-immune disease in which the presence of autoantibodies against acetylcholine receptors in the post-synaptic membrane causes a reduction in the number of receptors in the motor Plate² compromising neuromuscular transmission. This gives rise to fluctuating proximal muscular weakness which worsens with activity in the course of the day. Muscle fatigue is a typical clinic sign of this malady.³ In addition, bulbar symptoms may appear such as dysphonia, dysphagia, facial musculature weakness or a combination thereof.^{3,4}

In the majority of MG patients, the disease begins with ocular musculature compromise,^{5,6} with intermittent diplopia and palpebral ptosis. Accordingly, the Ophthalmology practice would be the first stop for undiagnosed patients.

Statins, i.e., 3-hydroxy-3 methylglutaryl coenzyme A (HMG-CoA) reductase inhibitors, are medicaments with demonstrated capacity to diminish concentration in blood and therefore prevent cardiovascular morbidity and mortality.⁷ The use of statins in primary as well as secondary care is supported by international reference therapeutic guides.^{8–11} For this reason, statins are routinely prescribed and their consumption is continuously increasing.¹² However, a side effect reported in scientific literature is the induction of self-immune diseases, including MG. The pathway through which statins

induce the development of self-immune diseases seems to be related to its ability to enhance T-cell phenotypes that reduce cellular immunity but increase humor immunity regulated by antibodies.¹³

As in the majority of patients MG debuted with ophthalmological symptoms,^{5,6} in many cases the ophthalmologist will be the first specialist to perform anamnesis and obtain their clinical records. Accordingly, it is advisable for said specialist to be familiar not only with MG-related symptoms but also with the possibility of the adverse reactions related to the therapeutic use of statins.

The results of scientific research are difficult to assess, giving rise to the need of analysis methods allowing us to study different aspects of said research. The parameters utilized to evaluate any activity can be defined as indicators. A set of indicators is applied to bring out one aspect of the object being assessed.¹⁴ At present, scientific policy reviews would not be understood without recourse to existing indicators.

By means of its indicators, bibliometry focuses precisely on calculating and analyzing quantifiable values of scientific consumption and production.^{15,16} Bibliometry can be defined as the science that studies the nature and cause of a discipline that gives rise to publications by computing and analyzing different aspects of written communications.¹⁷ Bibliometry involves obtaining, processing and managing quantitative reference data from scientific publications.¹⁸ The Organization for Economic Cooperation and Development (OECD) referred to bibliometry as a tool enabling the observation of the state

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