

DOI: <https://dx.doi.org/10.18203/2319-2003.ijbcp20243844>

Review Article

Bibliometric analysis on the publications of the statins-associated autoimmune myopathy: a comprehensive review

Smruti Besekar^{1*}, Sangita Jogdand¹, Suraj Dhankikar², Akansha Arewar²,
Marvel Bhosle³, Diptesh Besekar⁴

¹Department of Pharmacology, JNMC, Sawangi, Wardha, Maharashtra, India

²Department of Biostatistics and Epidemiology, College of Public Health, East Tennessee State University, Johnson City, Tennessee, USA

³Karunya Institute of Technology, Coimbatore, Tamil Nadu, India

⁴Moil, Nagpur, Maharashtra, India

Received: 16 September 2024

Accepted: 15 October 2024

*Correspondence:

Dr. Smruti Besekar,

Email: dr.smruti214@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

This bibliometric analysis aimed to assess the landscape of research on statin-associated autoimmune myopathy (SAAM), focusing on publication trends, contributors, and implications for further investigation. Access to the Scopus and Web of Science databases was obtained through institutional login credentials. An advanced search using keywords "statin associated autoimmune myopathy" or "SAAM" was conducted. Data were collected from 2003 to 2022 and analysed using the Biblioshiny package in R-Studio. A total of 110 publications were identified, involving 418 authors. The analysis revealed a steady increase in publication activity on SAAM, particularly notable in 2017, 2020, 2021, and 2022, with a peak of 13 publications in certain years. However, no publications were recorded in 2014. The accumulated citations from 2003 to 2022 totalled approximately 3,000, indicating a sustained interest in the topic. Statins, being first-line drugs for conditions like hyperlipidemia, diabetes mellitus, cardiovascular diseases, obesity, and cancer, underscore the importance of vigilant monitoring for associated adverse events. The analysis highlights the need for further research on SAAM, a drug-related adverse reaction, due to the widespread use of statins and their association with comorbidities. Understanding and monitoring SAAM is crucial for patient safety, and further investigation is needed to understand its mechanisms and risk factors.

Keywords: Bibliometric analysis, Statin, Myopathy, SAAM, Hypolipidemic drug

INTRODUCTION

Statins are a class of medications that reduce blood levels of triglycerides and cholesterol by blocking HMG-CoA reductase, an enzyme involved in the rate-limiting stage of cholesterol synthesis. Patients taking statins are approximately 2-20% more likely to develop toxic myopathies, which often disappear after the statin is stopped.¹ Recently, statin use has been linked to immune-mediated necrotizing myopathy, which is often treated using immunosuppressants. Anti-HMGCR myopathy, also known as statin-associated autoimmune myopathy (SAAM), is an uncommon type of immune-mediated

muscle injury in patients taking statins. The proximal muscles (shoulders, upper arms, thighs) on both sides of the body are badly weak, there are chronic symptoms even after stopping the offending statin medication, there are exceptionally high levels of creatine kinase (CK) produced by the breakdown of skeletal muscle, and there are persistent symptoms and CK elevation are the signs of the SAAM. After discontinuing the offending statin, the other types of muscle damage (myopathy) caused by statins typically disappear. It may present as mild joint pain and rashes. SAAM treatment includes stopping statins and recommending immunosuppressants, corticosteroids, immunoglobulin, and other therapies.² The bibliometric

analysis was conducted for analysing large data on this specific topic in the area of the publication, citations, researchers, top journals, and country wise publications.

METHODS

A login from the institution is necessary to access the Scopus and Web of Science databases. An "Advanced Search" was started using the keyword "statin associated autoimmune myopathy" or "SAAM". The planned search was carried out using the phrase (Statin associated autoimmune myopathy) for retrieving all publication-related information from both databases. All data "Text" files were downloaded and imported into R-studio. The bibliometrics package" was loaded before the "Biblioshiny" function, and then the biblioshiny function was run. Text files were imported through the Biblioshiny panel. The required graphs, tables, and charts for additional research were obtained following a query. Some graphs were obtained by using wisdom ai by using the keyword and, the data were collected in the forms of graphical presentations.

From the wisdom AI application, papers that have dealt with statin-related autoimmune myopathy were enrolled from 2002 to 2022, and an increase in publication activity was noted in the years 2017, 2020, 2021, and 2022, with a maximum of 13 publications; in 2014, no publications related to the topic were seen.

OVERVIEW

From 2003 to 2022, approximately 3,000 citations were gathered from the databases, comprising 110 publications. In total, 418 authors contributed to these studies, with each author contributing a different amount to publications worldwide. The mean number of citations per year among these years showed a consistent range between 2 and 3.

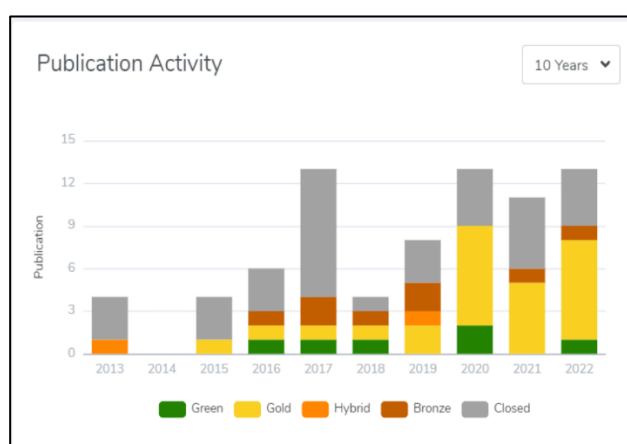


Figure 1: Publication of the studies related to the SAAM in year of 2013-2022.

Figure 1 shows the publication activity of the articles, which can be assessed from different perspectives. Papers related to statin-related autoimmune myopathy were

enrolled from 2003 to 2022, and an increase in publication activity was noted in 2017, 2020, 2021, and 2022, with a maximum of 13 publications; in 2014, no publications related to the topic were noted.

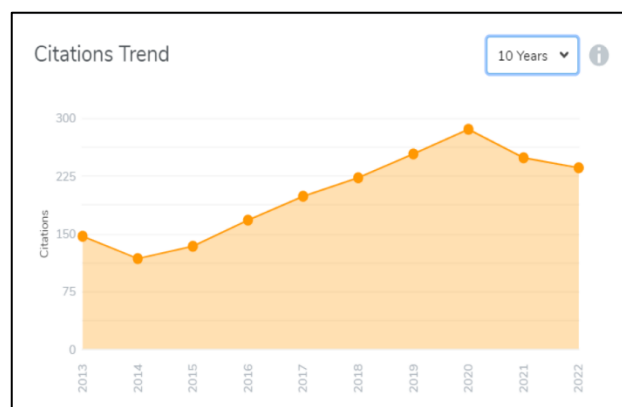


Figure 2: Citations used for SAAM in the year.

In this graph, citation trend as follows 2004- 66, 2005- 56, 2006- 77, 2007-59, 2008- 62, and 2020-286, 2020- 256, 2021- 249 respectively. Citation trend reports are useful for monitoring research progress over time. Research fronts, authors, institutions, regions, journals, publication years, and title-level data are all available for reports. To provide additional details and data transparency, the graph for the trend calculations included both normalized and raw data. In this analysis, 2020 had the most citations (286 articles), and 118 articles had a modest decline.

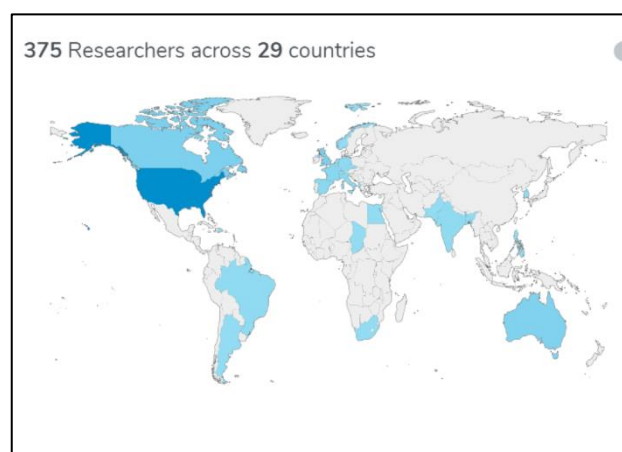


Figure 3: Researcher whom have worked on SAAM across the nations.

This data showed the 375 researchers across 29 countries, according to the country, India had two publications and four researchers; Australia had 10 publications and 18 researchers; South Korea had two publications and six researchers; Pakistan had one publication and one researcher; Egypt, South Africa, and Chad had one researcher and one publication; Brazil had two publications and five researchers; Argentina had one publication and four researchers; Spain had five

publications and 31 researchers; France had six publications and 20 researchers; and Italy had four publications and 29 researchers.

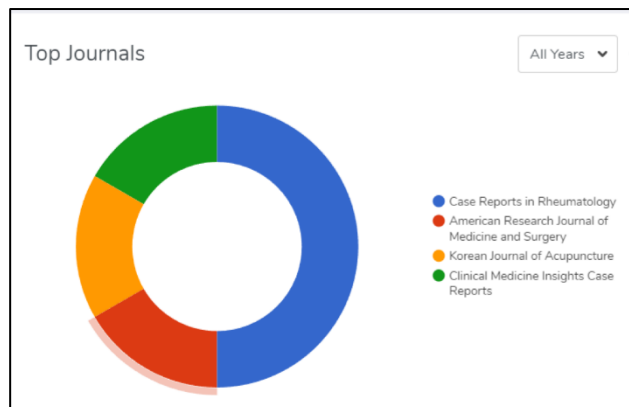


Figure 4: Prominent journals that published relevant SAAM studies.

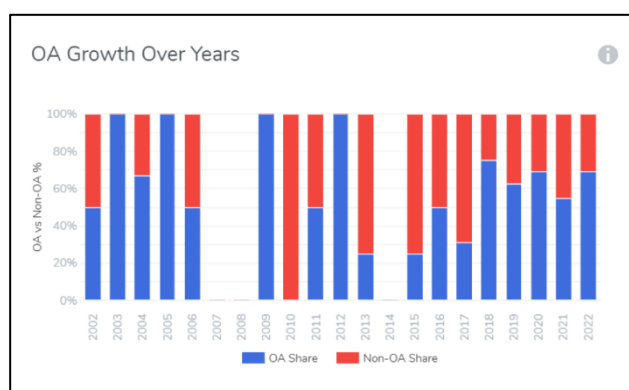


Figure 5: Open access and non-open access journals related to SAAM studies.

The most widely read journals for this subject were displayed in a pie chart. These journals included case reports in rheumatology, the American research journal of medicine and surgery, the Korean journal of acupuncture, and clinical medicine insights case reports.

The bar graph illustrates the percentage of research articles on this subject that were free to access and those that require subscription and were denoted as open access (OA) and non- open access (non-OA) respectively. In this bar graph, 2003 and 2009 showed the complete open access article (100% OA publication share) contributed to 1 OA publication and 2010 showed 100% non-OA publication share. Currently, 2022 9 OA publication contributed 69.2% share and 4 non-OA publication that defined 30.8% share. Based on their overall research output, the institutions were ranked as the top institutions showed in this pie chart. National Institute of health showed 11 publications (10.8%) and Vall d' Hebron Hospital universitari represented 3 publication (2.9%).

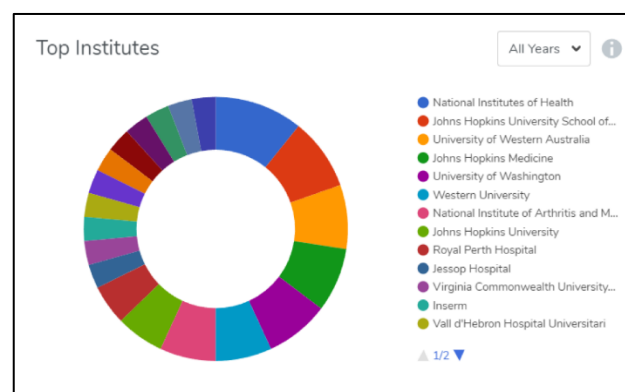


Figure 6: Institutes that have worked on and published studies on SAAM.

Table 1: Publication of the studies along with the year, journals name and authors.

S. no	Cited current publication author name	Year	Journals name
1	Almadhoun et al ³	2022	Cureus
2	Mendez et al ⁴	2022	ACR open rheumatology
3	Yeo et al ⁵	2022	Cureus
4	Escher et al ⁶	2022	Cureus
5	Liu et al ⁷	2022	Journal of the endocrine society
6	Joudeh et al ⁸	2022	Case reports in rheumatology
7	Barrons et al ⁹	2022	Journal of pharmacy practice
8	Mammen et al ¹⁰	2022	Rheumatic disease clinics of North America
9	Reddy et al ¹¹	2022	Reumatologia/ Rheumatology
10	Sharma et al ¹²	2022	Cureus
11	Wei et al ¹³	2022	Arthritis and Rheumatology
12	Jaffry et al ¹⁴	2022	Journal of the American college of cardiology
13	Patel et al ²	2022	Southern medical journal
14	Close et al ¹⁵	2022	Rheumatology (Oxford, England)
15	Tsui et al ¹⁶	2021	Journal of vitreo retinal disease
16	Webster et al ¹⁷	2021	Case reports in rheumatology
17	Nemati et al ¹⁸	2021	Cureus

Continued.

S. no	Cited current publication author name	Year	Journals name
18	Cha et al ¹⁹	2021	Cureus
19	Safi et al ²⁰	2021	Journal of the endocrine society
20	Aijaz et al ²¹	2021	Chest journal
21	Sharma et al ²²	2019	Journal community hospital internal medicine prespective.
22	Khan et al ²	2019	Rheumatology (Oxford, England)
23	Saleh et al ²⁴	2019	Journal of the Saudi Heart Association
24	Dio et al ²⁵	2019	Annals of internal medicine
25	Pogosky et al ²⁶	2019	Gastroenterology
26	Dixit et al ²	2018	Case reports in rheumatology
27	Villa et al ²⁸	2018	Acta myologica
28	Caughey et al ²⁹	2018	JAMA internal medicine
29	Calloghan et al ³⁰	2018	Expert review of clinical immunology
30	Khambhati et al ³¹	2017	Journal of the American college of cardiology
31	Sweidan et al ³²	2017	Clinical medicine insights case reports
32	Hussenbux et al ³³	2017	British journal of hospital medicine
33	Tiniakou et al ³⁴	2017	Current opinion in rheumatology
34	Nazir et al ³	2017	JCR journal of clinical rheumatology
35	Mammen et al ¹⁰	2017	Current opinion in rheumatology

Table 1 displayed the publication of current articles by year, indicating the number of articles published each year, and associated author works, along with the names of journals that have published relevant work more frequently.

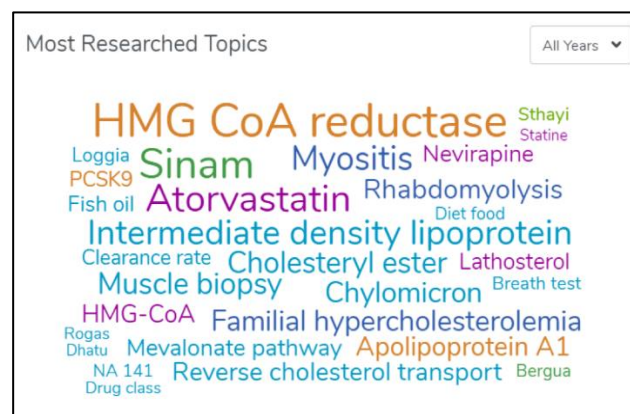


Figure 7: Most commonly used keywords used for searching.

It represented the most frequently used search terms for this topic are displayed in the word cloud. Many research disciplines are represented by text colours. The colours blue, orange, dark green, purple, sky blue, and green were used to depict diseases, biomolecules, places, chemical substances, general topics, and topical information, respectively.

DISCUSSION

Our bibliometric examination of the literature on statin-associated autoimmune myopathy from 2003 to 2022 showed an increase in the annual scientific output of about 10,755, with an absolute amount of 109 papers over the

years, with an appearance in 2017, 2020, and 2022. More than 14 documents will be published in 2022, highlighting the occurrence of these events. Case reports, systematic reviews, case series, treatment management, diagnosis, and surgical aspects of the disease are covered in approximately one-third of all published articles. These articles have been edited and published in high-ranking journals with a significantly better impact factor. In 2018, there was a sharp decline in the number of publications on SAAM. Publication activity is regarded as a metric for elucidating an author's or term's research activity, as it appears in a scientific publication.³⁵ Overall, it showed the number of year-wise publication outputs of the keyword in different access categories, and the study showed the highest number of articles in 2022 and fewer articles in 2003. The percentage of research articles on this subject that were free to access and those that require subscription and were denoted as open access (OA) and non- open access (non-OA) respectively and this analysis also estimated it with full OA in 2009 and recently 2022 showed 9 articles to OA.³⁶

The graph of the citation trend depicts the pattern of this subject's mentions by researchers over time based on keywords used in publications. Reports on citation trends are helpful for tracking the development of research over time. Reports can include information on research fronts, authors, institutions, locations, journals, publication years, and title-level data. The graph for the trend calculations contained both normalized and raw data to provide more information and data openness. Citation trends were highest in 2020 and lowest in 2004.

Second, regarding the geographical distribution of the scientific publications and authors contributing to it, Australia showed the highest number of 10 publication followed by France, Italy 6, Italy 4 and India had 2

publications respectively. The highest number of publications by the authors in this field was by Italy (29 researchers), France (20 researchers), Australia (18 researchers), and the lowest number was by Pakistan (1 researcher). Thus, it can be claimed that Australia, France, Argentina, and Italy have both a significant statistical scientific output and an efficient collaborative networking capability that is not spread but rather selected. Asia needs to increase its visibility on SAAM and create more publications on the topic as it lags behind the European and American areas. This shows that there is a dire need for more researchers globally to work on the relevant topic. The study also represented the top journals, top researchers, publishers, and institutions who worked on this topic of interest. The use of bibliometric analysis by researchers has increased in recent years. A popular and accurate method for analysing enormous amounts of scientific data is bibliometric analysis.³⁷ However, its use in business research is somewhat new and frequently underdeveloped. These analyses were used to monitor the output and influence of authors and researchers. This can support funding and grants as well as tenure and promotion. The determination of journal impact factors, which might assist in choosing which journal to publish in, is also performed using bibliometrics.^{38,39}

The handling and quantitative analysis of scientific publications falls under the purview of bibliometric studies. They fall within the umbrella of the so-called "social studies of science," with science policy serving as one of the primary application areas. These studies effectively supplement expert opinions and judgements, offering unbiased and practical instruments for assessing the outcomes of scientific investigations. However, considering the influence of these assessments on the distribution of research funding and even on the professional careers of researchers, it is crucial to be fully aware of the properties of bibliometric indicators and the restrictions placed on their application.⁴⁰

This bibliometric analysis often leads to the estimation of the number of studies that have been conducted on SAAM, retrieving a large amount of data from the entire world with the list of publications, researchers, and citations. However, the underlying mechanism by which statins cause statin-associated autoimmune myopathy remains unknown. In individuals with genetic susceptibility, SAAM may be the cause of this increase in HMG-CoA reductase synthesis and the related aberrant protein processing. Theoretically, this aberrant processing causes the production of antibodies that target HMG-CoA reductase protein, leading to SAAM.

Another idea holds that when statin drugs bind to the HMG-CoA reductase protein, the protein's structure may be altered, exposing immune system-intolerant antigens and leading to the formation of antibodies. The majority of patients were treated with immunosuppressive agents; prednisone was considered as the first-line drug along with the supplementation of steroids such as methotrexate,

mycophenolate, azathioprine, intravenous immunoglobulin, or rituximab. Some cases have reported the potential benefits of cyclosporine. Patients with hyperlipidaemia were treated with fenofibrate or ezetimibe, starting with lower and intermittent dosing until they did not cause any side effects.^{1,41,42}

Using a scientific technique called literary synthesis; researchers can closely examine important areas of medical research and obtain an overview of the landscape of published literature. Bibliometric techniques have developed to the point that they are now thought of as high-quality, trustworthy, and educational tools for keeping track of university departments and institutes, as well as for gauging research performance.⁴² The most commonly and frequently used journal for publication was found to be a curreus journal that showed 14 publications from 33 recent publications and the case report of rheumatology placed two publications. This showed that the curreus journal was the one who easily accepted the relevant novel articles and moved further for publication. This was the first investigation of a specific drug-related adverse response, and it revealed that only 109 publications had been published, which is a much smaller number of cases than previously reported. The drawback of the analysis was that the journal impact factor was not recorded, and the findings of this study offer preliminary proof that a journal's impact factor may not always be significantly influenced by highly cited papers.

CONCLUSION

This study represents the first examination of the relationship between statins and autoimmune myopathy, providing an overview of current trends and criteria for bibliometric evaluations of SAAM publications. The surprising conclusion that results from this finding is that it is not always appropriate to use the journal impact factor as a gauge of an institute's and author's level of publication success. This conclusion may have substantial ramifications for future research, policy, and practise in the fields of bibliometrics, scientometrics, information science, and publications studies. In essence, our study serves as a foundational resource for researchers, clinicians, policymakers, and other stakeholders invested in advancing our understanding of SAAM and its implications for clinical care. Through continued collaboration and innovation, we can strive towards better elucidating the complexities of SAAM and ultimately improving the lives of affected individuals.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

1. Nazir S, Lohani S, Tachamo N, Poudel D, Donato A. Statin-associated autoimmune myopathy: a systematic

- review of 100 cases. *J Clin Rheumatol Pract Rep Rheum Musculoskelet Dis.* 2017;23(3):149–54.
2. Patel PP, Jackson CD. When statins get physical: a curious cause of statin myopathy. *South Med J.* 2022;115(4):266–9.
3. Nazir S, Lohani S, Tachamo N, Poudel D, Donato A. Statin-associated autoimmune myopathy: a systematic review of 100 cases. *J Clin Rheumatol Pract Rep Rheum Musculoskelet Dis.* 2017;23(3):149–54.
4. Valor-Méndez L, Manger B, Knitza J, Schmidkonz C, Kleyer A, Schett G. Clinical images: tissue remodeling in autoimmune statin-induced necrotizing autoimmune myopathy. *ACR Open Rheumatol.* 2022;4(10):835–6.
5. Refractory statin-induced immune-mediated necrotizing myositis: challenges and perils in its management. Available at: www.researchgate.net. Accessed on 21 August 2024.
6. Escher AR, Hoffman JP, Alfieri S, Bordoni B, Evans RM. Immune-mediated myopathy in a patient presenting for melanoma resection and sentinel lymph node biopsy. *Cureus.* 2022;14(3):22777.
7. Shuster S, Awad S. A rare case of statin-induced necrotizing autoimmune myopathy. *AACE Clin Case Rep.* 2020;6(2):86–9.
8. Joudeh AI, Albuni MK, Hassen SS, Iqbal P, Aziz Bedair EM, Mahdi S. A case report of statin-induced immune-mediated necrotizing myopathy treatment challenges. *Case Rep Rheumatol.* 2022;2:4647227.
9. Barrons R. Statin-Associated Autoimmune Myopathy: Review of the Literature. *J Pharm Pract.* 2022;16:8971900211040291.
10. Mammen AL. Statin-associated myalgias and muscle injury-recognizing and managing both while still lowering the low-density lipoprotein. *Med Clin North Am.* 2021;105(2):263–72.
11. Somagutta MKR, Shama N, Pormento MKL, Jagani RP, Ngardig NN, Ghazarian K, et al. Statin-induced necrotizing autoimmune myopathy: a systematic review. *Reumatologia.* 2022;60(1):63–9.
12. Sharma A, Musurakis C, Nabil N, Poudel B, Trongtorsak A. A case series of statin-induced necrotizing autoimmune myopathy. *Cureus.* 2022;14(1):21613.
13. Wei J, Ketner E, Mammen AL. Increased risk of statin-associated autoimmune myopathy among American Indians. *Arthritis Rheumatol Hoboken NJ.* 2022;74(9):1602–3.
14. Jaffry H, Perdomo W, Cedano H, Khawaja U, Thomas A, Rudinskaya A. Statin induced necrotizing autoimmune myopathy without concurrent statin use: yet another sequela of covid-19? *J Am Coll Cardiol.* 2022;79(9):3337.
15. Potential implications of six American Indian patients with myopathy, statin exposure and anti-HMGCR antibodies. *Rheumatol. Oxford Academic.* Available at: <https://academic.oup.com/rheumatology>. Accessed on 12 August 2024.
16. Combined central retinal vein and cilioretinal artery occlusion in the setting of intravenous immunoglobulin administration - Jonathan Cin-Bon Tsui, Gordon Scott Crabtree. 2021. Available at: <https://journals.sagepub.com>. Accessed on 16 August 2024.
17. Webster P, Wiemer N, Al Harash A, Marshall C, Khatoon N, Lucke M. Challenges in Treating Statin-Associated Necrotizing Myopathy. *Case Rep Rheumatol.* 2021;2021:8810754.
18. Nemati M, Srai M, Rudrangi R. Statin-induced autoimmune myopathy. *Cureus.* 2021 Feb 26;13(2):13576.
19. Cha D, Wang F, Mukerji B, Mukerji V. Statin-induced necrotizing autoimmune myositis: diagnosis and management. *Cureus.* 2021;13(3):13787.
20. Safi T, Wagner H. Two cases of statin-induced immune-mediated necrotizing myopathy. *Lakartidningen.* 2021;118:21110.
21. Aijaz A, Lara FVD, Singh A, Ahuja S, Miyakawa L, Kim B. Statin-induced necrotizing autoimmune myopathy: a rare but serious cause of respiratory failure in the critically ill. *Chest.* 2021;160(4):728.
22. Sharma P, Timilsina B, Adhikari J, Parajuli P, Dhital R, Tachamo N. Statin-induced necrotizing autoimmune myopathy: an extremely rare adverse effect from statin use. *J Community Hosp Intern Med Perspect.* 2019;9(6):503–6.
23. Khan B, Newton L. E033 Statin-induced necrotizing autoimmune myopathy with anti HMG-CoA reductase antibodies. *Rheumatol.* 2019;58(3):kez110-32.
24. Saleh Y, Herzallah K, Hassanein M, Chang HT. Statin-induced necrotizing autoimmune myopathy: An uncommon complication of a commonly used medication. *J Saudi Heart Assoc.* 2019;31(4):269–72.
25. J DGD, Im CB. Proprotein convertase subtilisin/kexin type 9 antibody and statin-associated autoimmune myopathy. *Ann Intern Med.* 2019;171(1):237.
26. Pogosky AK, Dalal DS, DeNucci TD, Rupawala AH. Tu1548 – Statin-associated autoimmune myopathy: an unusual cause of persistent transaminasemia. *Gastroenterology.* 2019;156(6):34-8.
27. Dixit A, Abrudescu A. A case of atorvastatin-associated necrotizing autoimmune myopathy, mimicking idiopathic polymyositis. *Case Rep Rheumatol.* 2018;1:5931046.
28. Villa L, Lerario A, Calloni S, Peverelli L, Matinato C, DE Liso F, et al. Immune-mediated necrotizing myopathy due to statins exposure. *Acta Myol Myopathies Cardiomyopathies Off J Mediterr Soc Myol.* 2018;37(4):257–62.
29. Caughey GE, Gabb GM, Ronson S, Ward M, Beukelman T, Hill CL, et al. Association of statin exposure with histologically confirmed idiopathic inflammatory myositis in an Australian population. *JAMA Intern Med.* 2018;178(9):1224–30.
30. Selva-O’Callaghan A, Alvarado-Cardenas M, Pinal-Fernández I, Trallero-Araguás E, Milisenda JC, Martínez MÁ, et al. Statin-induced myalgia and myositis: an update on pathogenesis and clinical recommendations. *Expert Rev Clin Immunol.* 2018;14(3):215–24.

31. Khambhati J, Allard -Ratick Marc, Stahl E, Tahhan AS, Sandesara P. A severe case of statin-associated autoimmune myopathy. *J Am Coll Cardiol*. 2017;69(11):2240.
32. Sweidan AJ, Leung A, Kaiser CJ, Strube SJ, Dokukin AN, Romansky S, et al. A case of statin-associated autoimmune myopathy. *Clinical Medicine Insights: Case Reports*. 2017;23;10:1179.
33. Hussenbux A, Hofer M, Steuer A. Statin-induced necrotizing autoimmune myopathy: importance of early recognition. *Br J Hosp Med Lond Engl* 2005. 2017;78(6):352–3.
34. Tiniakou E, Christopher-Stine L. Immune-mediated necrotizing myopathy associated with statins: history and recent developments. *Curr Opin Rheumatol*. 2017;29(6):604–11.
35. Gilyarevskii RS. Publication activity as an indicator of scientific performance. *Sci Tech Inf Process*. 2014;41:170–7.
36. Open access vs. closed access | ZB MED – Informationszentrum Lebenswissenschaften. Available at: <https://www.publisso.de/en/advice/publishing-advice-faqs/open-access-vs-closed-access>. Accessed on 25 February 2024.
37. Donthu N, Kumar S, Mukherjee D, Pandey N, Lim WM. How to conduct a bibliometric analysis: An overview and guidelines. *J Bus Res*. 2021;133:285–96.
38. Agnihotram DG. Standard statistical methods and calculation of sample size in Medical education research. Available at: <https://www.pimr.org.in/Gopinath-vol-6-issue-1-2018.PDF>. Accessed on 17 March 2024.
39. What are Bibliometrics? - Bibliometrics - Research Guides at Embry-Riddle Aeronautical University. Available at: <https://guides.erau.edu/bibliometrics>. Accessed on 13 August 2024.
40. Bordons M, Zulueta MA. Evaluation of the scientific activity through bibliometric indices. *Revista espanola de cardiologia*. 1999;52(10):790-800.
41. Mammen AL. Statin-Associated Autoimmune Myopathy, *N Engl J Med*. 2016;374:664-9.
42. Manoj KL, George RJ. Bibliometric analysis for medical research. *Indian J Psychol Med*. 2023;45(3):277–82.

Cite this article as: Besekar S, Jogdand S, Dhankikar S, Arewar A, Bhosle M, Besekar D. Bibliometric analysis on the publications of the statins-associated autoimmune myopathy: a comprehensive review. *Int J Basic Clin Pharmacol* 2025;14:102-8.