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## BIBLIOMETRIC ANALYSIS OF MYOSITIS

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### Abstract

The study presents a Scientometric Analysis on Myositis. Myositis is a condition that causes inflammation of the muscles. The myositis research output was analyzed and it can see nearly 6014 bibliographic records and the contribution of myositis. The Period of study have been downloaded exclusively from Web of Science during the year 2013-2022, for the study bibliographic details such as authorship pattern, Degree of collaboration, etc., were analyzed by using Bibexcel. The most frequently cited articles focused on the classification and diagnosis of myositis, the development of new therapies and treatment options, and the use of biomarkers and genomics in diagnosis and treatment. Over all the bibliometric analysis suggests that myositis remains an active and important area of research.

**Keywords** – Bibliometric, Myositis, Scientometrics, Authorship Pattern, Degree of collaboration.

### INTRODUCTION

Bibliometric is a set of methods used to study or measure texts and information. Citations analysis and content analysis are commonly used bibliometric methods. While bibliometric methods are most often used in the field of library and information science, bibliometric has wide applications in other areas. Many research fields use bibliometric methods to explore the impact of a particular paper. Bibliometric are now used in quantitative research assessment exercises of academic output which is starting to threaten practice-based research. The UK government is considering using bibliometric in its research excellence framework a process that will assess the quality of the research output of UK universities and based on the assessment results, allocate research funding.

The application of the quantitative technique to libraries was until recently known as statistical bibliography. It was coined by Hulme in 1923. Pritchard used the term bibliometric in 1969 to describe all studies which seek to quantify the whole of written communication. He defined bibliometric as ‘the application of mathematics and statistical method to books and other media of communication’. Fairthorne defined bibliometric as, “the quantitative treatment of the properties of recorded discourse and behavior about it.”

Hawkins interpreted Bibliometrics as ‘quantitative analysis of the Bibliographic feature of a body of literature’. Potter defined it as ‘the study and measurement of the publication patterns of all forms of written communication and their authors’. According to Sengupta Bibliometrics is ‘the organization, classification and quantitative evaluation of publication patterns of all macro and micro communication along with their authorships by mathematical and statistical calculus’. Schraden looks upon Bibliometrics

as the 'Science of recorded discourse' which uses specific methodologies, mathematical and scientific, methods in its research in a controlled study of communication. It is the body of literature bibliography quantitatively or numerically or statistically analyzed or a statistical bibliography, a bibliography in which measurements are used to document and explain the regularity of communication phenomena'.

## MYOSITIS

Myositis is a condition that causes inflammation of the muscles. There are different types of myositis, which may be the result of an infection, injury, medication, or autoimmune disease. Myositis is a group of conditions that share the common feature of chronic muscle inflammation, resulting in muscle weakness and damage.

In the late 19th century, polymyositis and dermatomyositis were described by different scientists. In 1916, Stertz was the first who described the association between dermatomyositis and malignancy. In 1975, Anthony Bohan and James B. Peter were the first physicians who classified polymyositis and dermatomyositis into 5 subtypes which were used for decades. By 1990, multiple myositis-specific auto antibodies (MSA) were discovered and described. These myositis-specific auto antibodies (MSA) targeting different cytoplasmic rib nucleoproteins and they are used by Love et al. to classify polymyositis and dermatomyositis. In 1991, Love et al proposed another classification of idiopathic inflammatory myopathy based on myositis-specific auto antibodies. It's more common in women and tends to affect people aged 30 to 60.

There are three types of myositis here, they are:

- 1) Polymyositis
- 2) Dermatomyositis
- 3) Juvenile myositis

### TYPES

#### POLYMYOSITIS

Polymyositis is a rare disease that affects proximal, or core, muscles, such as the back hips, and neck. This muscle weakness can appear in a matter of days or become apparent over several months.

#### DERMATOMYOSITIS



Dermatomyositis also affects the proximal muscle. However, DM causes skin rashes and other skin-related symptoms as well



#### JUVENILE MYOSITIS

Juvenile myositis affects children younger than then 18 years of age. The condition includes juvenile

polymyositis and juvenile Dermatomyositis.



## REVIEW OF LITERATURE

**Zhu, Y., Chang, T., et al (2022)** have explained that Tendinopathy is a tendon disease that often occurs in athletes. Many studies have revealed that exercise therapy is beneficial for the non-operative management of tendinopathy. However, the general aspect of bibliometric analysis of this global research topic associated with exercise and tendinopathy is lacking. The present study aimed to make a bibliometric analysis of worldwide development tendencies and research hotspots in exercise and tendinopathy research from 2001 to 2020. Using the Web of Science, articles and reviews published between 2001 and 2020 were retrieved from the Science Citation Index Expanded database. Cite Space was used to analyze the relationship among publications, countries, institutions, journals, authors, references, and keywords.

**Wang, K.T., et al (2022)** the present Cytokine storms are violent inflammatory immune responses that reveal the devastating effect of immune deregulation and the critical role of an effective host immune response. The scientometric analysis summarizes the literature on cytokine storms in recent decades and provides a valuable and timely approach to tracking the development of new trends. This review summarizes the pathogenesis and treatment of diseases associated with cytokine storms comprehensively based on scientometric analysis. Field distribution, knowledge structure, and research topic evolution correlated with cytokine storms are revealed, and the occurrence, development, and treatment of diseases relevant to cytokine storms are illustrated.

**Bu, Y., Wu, H., Deng, R., & Wang, Y. (2021)** Sphingosine kinase 1 (SphK1) is a key enzyme that catalyzes the conversion of sphingosine (Sph) to sphingosine 1-phosphate (S1P), so as to maintain the dynamic balance of sphingolipid-rheostat in cells and participate in cell growth and death, proliferation and migration, vasoconstriction and remodeling, inflammation and metabolism in a scientometric way. The normal expression of SphK1 maintains the balance of physiological and pathological states, which is reflected in the regulation of inflammatory factor secretion, immune response in traditional immune cells and non-traditional immune cells, and complex signal transduction. However, abnormal SphK1 expression and activity are found in various inflammatory and immune related-diseases, such as hypertension, atherosclerosis, Alzheimer's disease, inflammatory bowel disease and rheumatoid arthritis.

**Teng, C. L., Chew, W. Z., (2020)** this study is related to a scientometric study. To assess the content, authorship, and study design of rheumatologic and immune related disease in a bibliometric study and the publications written by Malaysian authors or about rheumatologic conditions in Malaysia. The Malaysian Medical Repository (My Med R), a web-based database of Malaysian health and medical publications, and Scopus were searched to retrieve rheumatologic publications from Malaysia, for the period 1950 until 30 June 2019. The type and number of publications in each rheumatologic subject are analyzed and the overall trend of publication numbers and citations were analyzed. 547 publications were found for the period studied. The median number of citations per paper was 5, but unlike the number of publications, there was only a slight increase in the number of citations with time. 84.5% of the papers were cited at least once.

**Moreir, Alvaro, Loquai,(2019)** to characterized the bibliometric analysis on clinical presentation, laboratory and histopathology characteristics and assess the treatment and outcome of neuromuscular side-effects of check point therapy. The side-effect registry and the institutional database from ten skin cancer centers were queried for reports on myositis and neuromuscular side-effects induced by check point inhibitors. In total, 38 patients treated with ipilimumab, tremelimumab, nivolumab and pembrolizumab for metastatic skin cancer were evaluated and characterized.

## RESEARCH DESIGN

Research is a statistics and bibliography process of achieving certain goals on a topic. According to Jahoda, "Research Design" is the arrangement of conditions for the collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. Simply called a blueprint of research or advancing planning of research. The research design is the arrangement of conditions from collecting and analysis of data in a material that aims to combine with relevance to the research and purpose of the myositis procedure.

## OBJECTIVES

- ❖ To know the year-wise distribution of articles
- ❖ To classify the authorship pattern of the contribution
- ❖ To find out the degree of collaboration
- ❖ To analyze the relative growth rate and doubling time
- ❖ To know key word wise Distribution
- ❖ To know the Zipf's Law: a frequency of word
- ❖ To an analysis of the Exponential growth rate and Doubling time
- ❖ To classify the Time Series Analysis

## METHODOLOGY

The data for the study were retrieved from a Web of Science database, which is the scientific and indexing services maintained by Clarivate Analytics. The myositis research output was analyzed. It can see nearly 6014 bibliographic records and the contribution of myositis. Records during the period of study have been downloaded exclusively from Web of Science during the year 2013-2022, for the study bibliographic details such as author wise, document type, collaboration, etc., were analyzed by using Bibexcel. Bibexcel is a software package used for bibliographic analysis and information visualization. The collected data were analyzed with Bib excel software.

**TOPIC: MYOSITIS PERIOD: 2013-2022**

## SOURCE OF DATA

Web of Science database is an online subscription based scientific citation indexing service maintained by Clarivate Analytics that provides a comprehensive citation search as the primary source of data.

## SOFTWARE PACKAGE USED

To retrieve the data and analyze the following software tools have been used: **Bibexcel, Microsoft Excel and VOS viewer**

## TOOLS APPLIED

Statistical tools and techniques to serve the fundamental purpose of the descriptive and differential analysis the following techniques were used in the study.

- Percentage
- Relative growth rate and doubling time
- Degree of collaboration
- Authorship Pattern
- Exponential growth rate
- Time series analysis

## DATA ANALYSIS

In this chapter, the investigator has presented the collected data and its interpretation by using statistical tools calculated with the help of Microsoft Excel.

**Table 1: Year-Wise Distribution**

S.No	Publication Year	Record Count	percentage
1.	2013	420	7.09%
2.	2014	482	7.49%
3.	2015	450	8.02%
4.	2016	502	8.36%
5.	2017	583	9.72%
6.	2018	623	10.37%
7.	2019	671	11.17%
8.	2020	680	11.32%
9.	2021	796	13.25%
10.	2022	807	13.33%
<b>Total</b>		<b>6014</b>	<b>100%</b>

Table 1 shows that out of 6014 articles in the journals, the highest number of 807 (13.33%) articles were published in 2022 followed by 796 (13.25%) articles published in 2021 followed by 680(11.32%) articles published in 2020, the lowest number of articles 420(7.09%) were published in 2013.



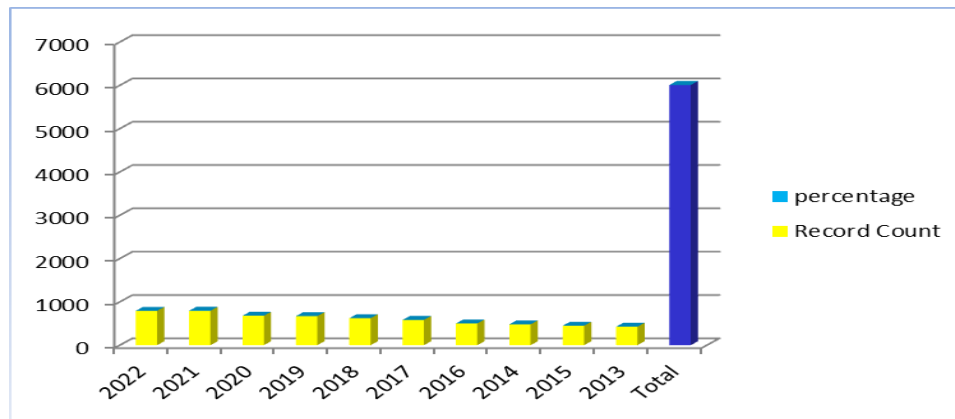


Figure1: Year wise Distribution

Table 2: Authorship pattern

Year	Single author	Two author	Three author	Four author	Five author	More than five author	Total
2013	22	49	50	65	45	189	420
2014	23	46	62	60	59	232	482
2015	19	51	58	52	67	203	450
2016	10	62	74	60	71	225	502
2017	22	42	60	67	58	334	583
2018	-	4	10	10	7	592	623
2019	2	13	15	12	15	614	671
2020	3	14	14	12	17	620	680
2021	7	20	21	31	30	687	796
2022	3	17	21	23	37	706	807
<b>Total</b>	<b>111</b>	<b>318</b>	<b>385</b>	<b>392</b>	<b>406</b>	<b>4402</b>	<b>6014</b>

Table 2 examine the year-wise authorship pattern, highest number of papers were published in the year 2014, with 482 authors contributing this year, followed by the year 2015,450 authors contributed in the year. The lowest author produced in the year 2013, 420 authors contributed in the year.

Table 3: Degree of Collaboration

Year	Single Author	Multiple Authors	Total	Degree of Collaboration
2013	22	398	420	1.06

2014	23	459	482	1.05
2015	19	431	450	1.04
2016	10	492	502	1.02
2017	22	561	583	1.03
2018	-	623	623	0
2019	2	669	671	1
2020	3	677	680	1
2021	7	789	796	1
2022	3	804	807	1
<b>Total</b>	<b>111</b>	<b>5903</b>	<b>6014</b>	<b>9.2</b>

**DC=NM/NM+NS**

Where DC= Degree of Collaboration  
 NM=Number of Multiple Authored Paper  
 NS= Number of Single Authored papers.

Table 3 clearly explained the degree of collaboration. DC range starts from 1.06 and gradually decreased to 1 in the year 2022. The overall Degree of Collaboration is 9.2.

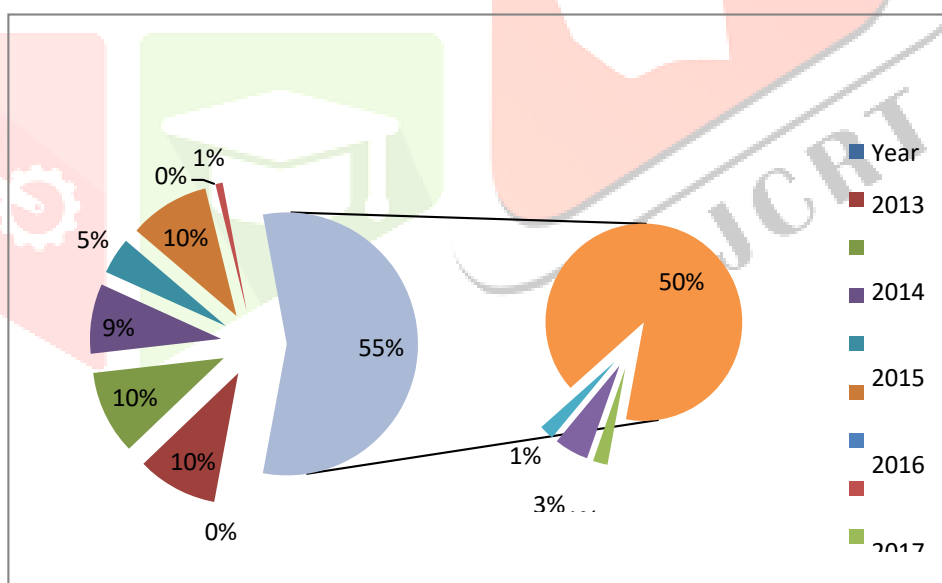


Figure 2: Degree of Collaboration

Table 4: Relative Growth Rate and Doubling Time

Year	Total	Cumulative	W1	W2	RGR= (W2-W1)	Mean	DT	Mean
2013	420	426		6.05	-		-	
2014	482	908	6.18	6.81	0.63	1.27	1.1	0.64

2015	450	1358	6.11	7.21	1.1		0.63	
2016	502	1860	6.22	7.53	1.31		0.53	
2017	583	2444	6.37	7.80	1.43		0.48	
2018	623	3067	6.43	8.02	1.59		0.44	
2019	671	3738	6.51	8.22	1.71	1.88	0.41	0.40
2020	680	4418	6.52	8.39	1.87		0.37	
2021	796	5214	6.68	8.56	1.88		0.37	
2022	807	6014	6.66	8.70	2.04		0.34	
<b>Total</b>	<b>6014</b>					<b>3.15</b>		<b>1.04</b>

$$RGS=(W2-W1)$$

W1=logw1 (natural log of the initial number of publications)

W2=logw2 (natural log of the initial number of publications)

$$DT=0.693/RGR$$

Table 4 explained the relative growth rate of the total contribution published gradually increased. The growth rate in 0.63 in 2014, which is increased to 2.04 in 2022 at the same time doubling time decreased from 1.1 to 0.34 in the year of 2014 to 2022.

**Table: 5 Keyword Wise Distribution**

S.No	Words	Recs	Percent	TLCS	TGCS
1	Myositis	2431	44.2	6858	16879
2	Patients	871	15.8	3219	12214
3	Inflammatory	830	15.1	4027	10989
4	Dermatomyositis	678	12.3	4539	12231
5	Association	663	12.1	2671	9696
6	Disease	620	11.3	2168	8802
7	Antsy	560	10.2	2737	8595
8	Body	547	9.9	2464	4473
9	Muscle	524	9.5	1301	5792
10	Inclusion	523	9.5	2392	4295

**TCLS**–Total Local Citation Score

**TGLS**–Total Global Citation Score

Table 5 shows that top 10 keywords and their corresponding statistics from a dataset related to Myositis. The most frequent words include Myositis, Patients, and Inflammatory, while Dermato myositis and Association also rank high.



**Table 6: Zipf's Law: Frequency of Word**

S. No	Words	Frequency (f)	Rank (r)	Log f	Log r	r*f=c	Log c
1	Myositis	2431	1	3.39	0.00	2431	3.39
2	Patients	871	2	2.94	0.3	1742	3.24
3	Inflammatory	830	3	2.92	0.48	2490	3.4
4	Dermatomyositis	678	4	2.83	0.6	2712	3.43
5	Association	663	5	2.82	0.7	3315	3.52
6	Disease	620	6	2.79	0.78	3720	3.47
7	Anty	560	7	2.75	0.85	3920	3.59
8	Body	547	8	2.74	0.9	4376	3.64
9	Muscle	524	9	2.72	0.95	4716	3.67
10	Inclusion	523	10	2.72	1	5230	3.72

Table 6 analyses are made to find the frequency of keyword using Zipf's law by following steps in Bib excel. Here the keyword used for the search strategies are analyzed and thee top 10 were listed in this table. The keyword "Myositis" stands in the first place with 2431 records. "Patients" stands in the second place with 871 records, "Inflammatory" stands in the third place with 830 records, and soon.

**Table 7 Exponential Growth Rate**

S. No	Year	Total	Exponential Growth Rate
1.	2013	420	<b>0</b>
2.	2014	482	<b>1.13</b>
3.	2015	450	<b>0.93</b>
4.	2016	502	<b>1.11</b>
5.	2017	583	<b>1.16</b>
6.	2018	623	<b>1.07</b>
7.	2019	671	<b>1.08</b>
8.	2020	680	<b>1.01</b>
9.	2021	796	<b>1.17</b>
10.	2022	807	<b>1.00</b>
<b>Total</b>		<b>6014</b>	<b>9.66</b>

Table 7 shows the exponential growth rate of publications in myositis during the year 2013 -2022 (10 years). The highest growth rate of 1.17 was found during 2021 with 796 publications. Followed by the year 2022 the growth rate is 1.00 with 807 publications. The lowest growth rate is 0.93 with 450 publications in the year 2015. It is also found that the exponential growth rate was found to be 9.66 and the average growth rate has a positive value showing the increasing trend in the Myositis research.

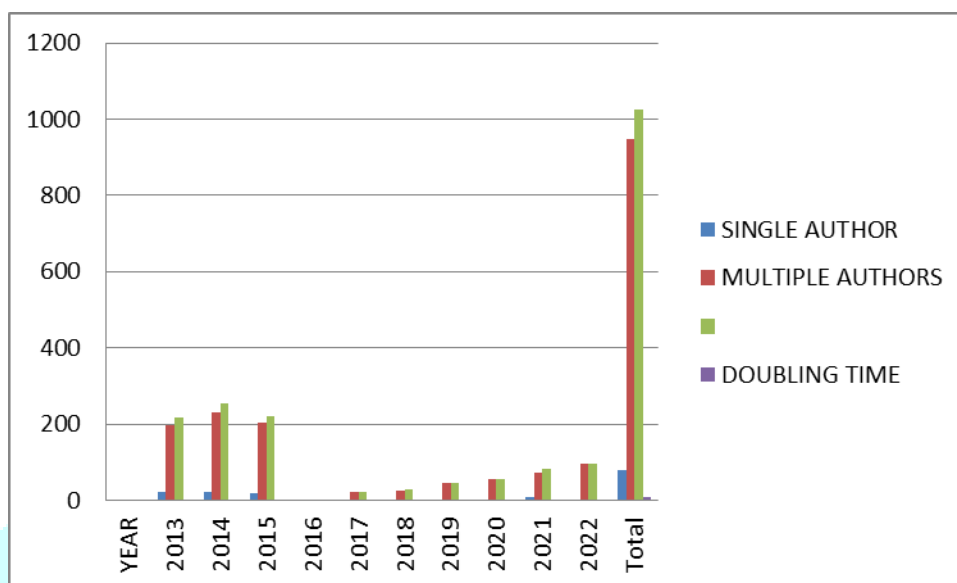


Figure 3 Exponential Growth Rate

Table 8 Time Series Analysis

Year	No. of Publications(Y)	X	X <sup>2</sup>	XY
2013	420	-1	1	-426
2014	482	-2	4	-964
2015	450	-3	9	-1350
2016	502	-4	16	-2008
2017	583	0	0	0
2018	623	1	1	623
2019	671	2	4	1342
2020	680	3	9	2040
2021	796	4	16	3184
2022	807	5	25	4000
<b>TOTAL</b>	<b>6014</b>			<b>-6428</b>

The straight-line equation is applied to arrive at estimates for future growth under the Time Series Analysis. On the application formula of time series analysis and subsequently, from the results obtained separately from the years 2025 - 2030. It is found that the future trends of growth of research articles in Myositis research India output may take on an increasing trend during the year to come. The inference from the calculations proved that the negative growth at the India level in their search literature output of Myositis.

## FINDINGS

### Year-wise distribution

The total number of records is 6,014. The highest numbers of records were published in 2022 with 807 records, and the lowest numbers of records were published in 2013 with 420 records.

### Authorship Pattern

The number of publications by the number of authors from one to more than five, for each year from 2013 to 2022. The total number of publications is 6014. The findings suggest that the majority of publications have multiple authors, with a large proportion having three or four authors. In 2013-2015, around half of the publications had three or four authors.

### Degree of Collaboration

The majority of publications are multiple-author publications. The number of single-author and multiple-author publications, as well as the total number of publications, and the degree of collaboration for each year from 2013 to 2022. The total number of publications is 6014. DC range starts from 1.06 and gradually decreased to 1 in the year 2022. The overall Degree of Collaboration is 9.2.

### Relative Growth Rate

The findings suggest that there has been a steady increase in the number of publications over the years, with a total of 6014 publications recorded. The rate of growth increased over time, with the largest increase in the number of publications observed between 2021 and 2022.

### Keyword Wise Distribution

The most frequent words and their statistics from a dataset related to Myositis. The most commonly occurring words include Myositis, Patients, Inflammatory, Dermatomyositis, and Association. These findings suggest that there is a strong focus on understanding the disease and its impact on patients, particularly in the context of inflammation and the muscular system.

### Zipf's law: Keyword Analysis

The frequency of keyword using Zipf's law by following steps in Bib excel. Here the keyword used for the search strategies are analyzed and the top 10 were listed in this table. "Myositis" stands in the first place with 2431 records.

### Exponential Growth Rate

The total number of records over the period is 6014, The highest growth rate of 1.17 was found during 2021 with 796 publications, the lowest growth rate is 0.93 with 450 publications in the year 2015.

### Time Series Analysis

It is found that the future trends of growth of research articles in Myositis research India output may take on an increasing trend during the year to come. The inference from the calculations proved that the negative growth at the India level in the research literature output of Myositis.

## CONCLUSION

This study has been highlighted for bibliographic analysis to measure various reviews such as growth of article, authorship pattern institution of distribution country wise distribution in which can be used to observations has analysis of the article. The most commonly used keywords in publications on myositis during this period were "myositis", "polymyositis", "Dermatomyositis", "inflammatory myopathy", and "autoimmune myopathy". The most frequently cited articles focused on the classification and diagnosis of myositis, the development of new therapies and treatment options, and the use of biomarkers and

genomics in diagnosis and treatment. Overall, the bibliometric analysis suggests that myositis remains an active and important area of research.

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