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Global Research output on Eosinophilia Literature: A Scientometric Analysis

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Abstract

The study analyses that research output on eosinophilia from 1998-2017 on different parameters including the literature growth, year -wise cited records, number of authors & h-index. The relative growth rate (RGR) and doubling time (Dt), the time series analysis for articles, contribution of various subject fields, highest research productivity of journals and their citation with impact factor and keyword analysis. The higher numbers of publications 793 were published in 2016, the scientists most preferred journals are Journal of Allergy and Clinical Immunology, Journal of immunology, American Journal of Respiratory and Critical Care Medicine. The high frequency keywords were: Eosinophilia (3175), Asthma (1365), Eosinophilic (1335) and Syndrome (1303). The Web of science database has been used to retrieve the data for 20 years (1998-2017) by searching different relevant keywords in its combined title, abstract and keywords fields.

Keywords: Eosinophilia, Allergy, Scientometric, Disease, Asthma

1. Introduction

The effectiveness of scientific research performance could be realized only through a proper communication system. Thus science and scientific communication are so interrelated that one influences the other for the generation of information. Among scientists and social scientists, it is widely accepted that public research performed in academic and governmental research institutions are driving force behind high technological and economic growth. It is true that research makes an important

contribution to the economic growth of a nation. Such research output is used as the yardstick for measuring the quality and quantity of research done in a country. It is interesting to note that during the last few years, bibliometric / scientometric tools and techniques have been increasingly used and being used to evaluate the research performance of the scientists and the growth of various disciplines of science.

Human beings come across many problems through Eosinophilia. The seriousness of the disease is based on the level of the infection of “Eosinophilia”. The type one Eosinophilia is “Primary eosinophilia” and the type two Eosinophilia is “Secondary eosinophilia”. The anomaly in hematopoietic stem cell will lead to the increase of eosinophil’s in the blood leads to an “eosinophilia”, which is called Primary eosinophilia. Due to allergy, the cytokines drive a reactive process and increase the Eosinophil in the blood, leads to the secondary type of Eosinophilia. The allergy may be caused either by drug or by environment pollution. Some food may also cause allergy which leads to “Eosinophilia”. Therefore, people who are all utilizing such grains and fruits are affected by Eosinophilia. Chronic usage of same categorized vegetables, packed food, tin food, non vegetarian food may be a cause for allergic, which destines to “Eosinophilia”. Thus, there is a scarcity of studies on the global research output of eosinophilia literature. The necessity of undertaking a comprehensive study on eosinophilia research literature from leading databases like Web of Science covering a long period of time is visible and felt.

2. Review of Literature

Chithiraivel and Jeysankar (2019) have analyzed the eosinophilia research output carried out during the year 1998-2017 with 267 publications; two and more authored papers constitute majority of the contribution and degree of collaboration had a maximum value of 7.14. The result shows that research development activities are increasing in eosinophilia research in India.

Jeysankar and Grace (2016) analyzed the publishing pattern of ecology literature during 1964 - 2013. The Scopus database is used to retrieve the data in the field of Ecology in India and 1165 records were found during the study period. The literature growth was studied through relative growth rate and doubling time. Authorship pattern

was identified as multiple authored contributions are gradually increasing after the year 1984 which is evidenced by the collaboration rate of authors in every decade.

Caforio et al., (2013) have explained that the data are no universally accepted guidelines for the diagnosis of EM but as the disease becomes better recognized so will its characterization. The Japanese Circulation Society Task Force Committee on Acute and Chronic Myocarditis published helpful guidelines for the diagnosis and treatment of EM; essential diagnostic features include eosinophilia $> 500/\mu\text{L}$, cardiac symptoms, elevated cardiac enzymes, electrocardiogram (ECG) changes, and cardiac dysfunction on ultrasonography, especially in the setting of unremarkable coronary angiography. Definitive diagnosis requires an endomyocardial biopsy.

Ardanuy (2013) has provided an overview of studies that have used citation analysis in the field of humanities in the period 1951 to 2010. The work is based on an exhaustive search in databases particularly those in library and information science and on citation chaining from papers on citation analysis.

Lancho Barrantes, (2012) have observed that the scientometric studies have, by and large, focused on the features of the hard sciences rather than the soft sciences. Prior research has been highly centered on natural science disciplines and not many studies have dealt with the social sciences. This applies to Africa as well. However, attempts to investigate the features and tendencies in the social sciences are gradually emerging.

Liu, Baughman and Myocarditis (2012) have explained that the myocarditis refers to heart muscle inflammation secondary to direct external antigen exposure such as viruses, bacteria, parasites, and drugs or to autoimmune activation against self-antigens. Traditionally the diagnosis of myocarditis was based on the histological Dallas criteria on endomyocardial biopsy which mandates the visualization of inflammatory cells and myocardial necrosis on the same microscopic section; if concomitant necrosis is not detected the diagnosis of myocarditis is considered borderline.

Rochester and Vakkri (2003) have studied international and national trends in LIS research based on research articles in a core collection of journals. They described the trends in LIS research by comparing distribution of topics, subtopics, approaches and methods in national LIS studies in Australia, China, Finland, Spain, Turkey and the

United Kingdom and relate them to international trends. The comparison has shown a remarkable variation of emphases and trends in research in the countries examined.

Saferstein (2001) has explained that the forensic science refers to the application of principles and methods of specialized scientific and technical knowledge to criminal and civil legal questions and presenting the finding in an unbiased and objective way in courts of law. “Forensic science is the application of science to those criminal and civil laws that are enforced by police agencies in a criminal justice system”.

Vellaichamy and Jeysankar (2018) highlighted quantitatively the growth and development of world literature on hemophilia in terms of publications output as per SCOPUS database (2003-2017). During 2003-2017 a total of 13503 papers were published by the scientists in the field of hemophilia. The average number of publications published per year was 900. The highest number of publications (1095) was published in 2012. Out of 13503 contributions, only 18.48% (2495 papers) of single authored and rest of 11008 papers (81.52%) were multi authored. The yearly analysis of data shows that there is a rapid growth of literature from 2011 onwards. There were 126 countries involved in the research in this field. USA is the top producing country with 3986 authorships (29.52%) followed by United Kingdom with 1438 authorships (10.65%). Still, in an international sense, relative productivity of India is low and requires more focused research and development.

3. Objectives

The purpose of the present study is to undertake a comprehensive study of global research efforts in the field of eosinophilia to examine the following objectives:

- To analyze Global and National level eosinophilia research output using various scientometric indicators.
- To identify the source wise and year wise distribution of eosinophilia research output.
- To examine the exponential growth rate, RGR, Dt and Time Series Analysis of eosinophilia literature output during the study period and
- To identify the core research areas and Highest Citation with Impact Factor journals.

4. Methodology

The records published during 1998-2017 in the field of eosinophilia which are covered in the web of science database was searched and bibliographic details like author, title, publication type, address of contributors, sources etc. were collected. The retrieved records were converted into HistCite for the purpose of analysis. The data was analyzed in terms of growth rate and core journal in the field of eosinophilia. Relative growth rate (RGR) and Doubling time (Dt) of eosinophilia literature have also been calculated.

5. Data Analysis and Interpretation

Web of Science is the largest abstract and citation database of research literature and quality web only journals. The study period 1998 to 2017 is selected as the database is available. A total of 12118 records were downloaded and analyzed by using the HistCite software application analyzed and tabulated for making observations as per the objectives of the study.

Table 1: Literature Output on Eosinophilia Research: Year- wise Evaluation

S. No	Years	Records	%	TCS	%	Rank
1	1998	444	3.66	20159	7.10	20
2	1999	563	4.65	20565	7.24	13
3	2000	514	4.24	20209	7.12	17
4	2001	508	4.19	20755	7.31	18
5	2002	520	4.29	19603	6.91	16
6	2003	545	4.50	20725	7.30	15
7	2004	480	3.96	19016	6.70	19
8	2005	553	4.56	16581	5.84	14
9	2006	564	4.65	16074	5.66	12
10	2007	575	4.75	14500	5.11	10
11	2008	567	4.68	13131	4.63	11
12	2009	618	5.10	14613	5.15	8
13	2010	611	5.04	12372	4.36	9

14	2011	641	5.29	11445	4.03	7
15	2012	675	5.57	10985	3.87	6
16	2013	706	5.83	10151	3.58	5
17	2014	765	6.31	9021	3.18	2
18	2015	749	6.18	7374	2.60	3
19	2016	793	6.54	4689	1.65	1
20	2017	727	6.00	1912	0.67	4
Total		12118	100.00	283880	100.00	

During the study period 1998 to 2017 (Twenty Years), 12118 records were downloaded from the database of Web of Science for the analysis of research productivity on “Eosinophilia”. According to the publication output from the Table 1 reveals that the total number of records published were 12118 at an average of 606 records per year. The Total Citation Scores received from 12118 research publications were 283880 at an average citation score of 14194 respectively. The number of research publications increased year by year, which started with 444 (3.66%) in the year of 1998 and soars to 793 (6.54%) records in the year 2016. The research growth started slowly, but has grown steadily and attained to the record count of 12118 in the year 2017, which may grow and grow annually in the near future. The year 2016 has highest number of publications 793(6.54%) with 4689 Total Citation Scores and being a first position among years output for 20 years. This is followed by the year 2014 which has 765 (6.31%) records and it stood in the second position of publishing with 9021 TCS scored. The year 2015 has 749 (6.18%) publications and occupies the third position along with 7374 TCS measured. The year 1998 has 444 publications with 20159 TCS; it stood with the lowest publications in the study period.

The year 2001 which was responsible for 508(4.19%) number of research publications secured the most Total Citation Scores of 20755(7.31%). The year 2003 which was responsible for the publication of 545 records secured the second highest Total Citation Scores of 20725. The third place of the maximum secured Total Citation Scores was credited for the year1999 for a Total Citation Scores of 20565 for a total number of publications of 563. Throughout the year from 1998 to 2017, the three years

2001, 2003, 1999 were the more prolific years which shared the first three places for securing more Total Citation Scores.

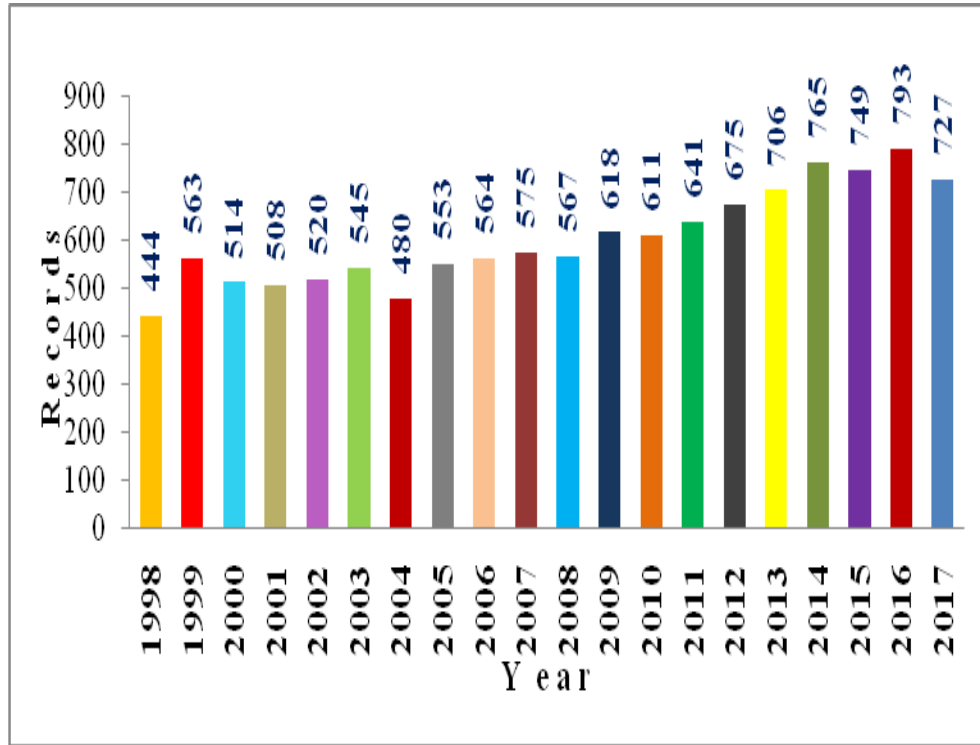


Figure 1: Year-wise Productivity of Eosinophilia Research

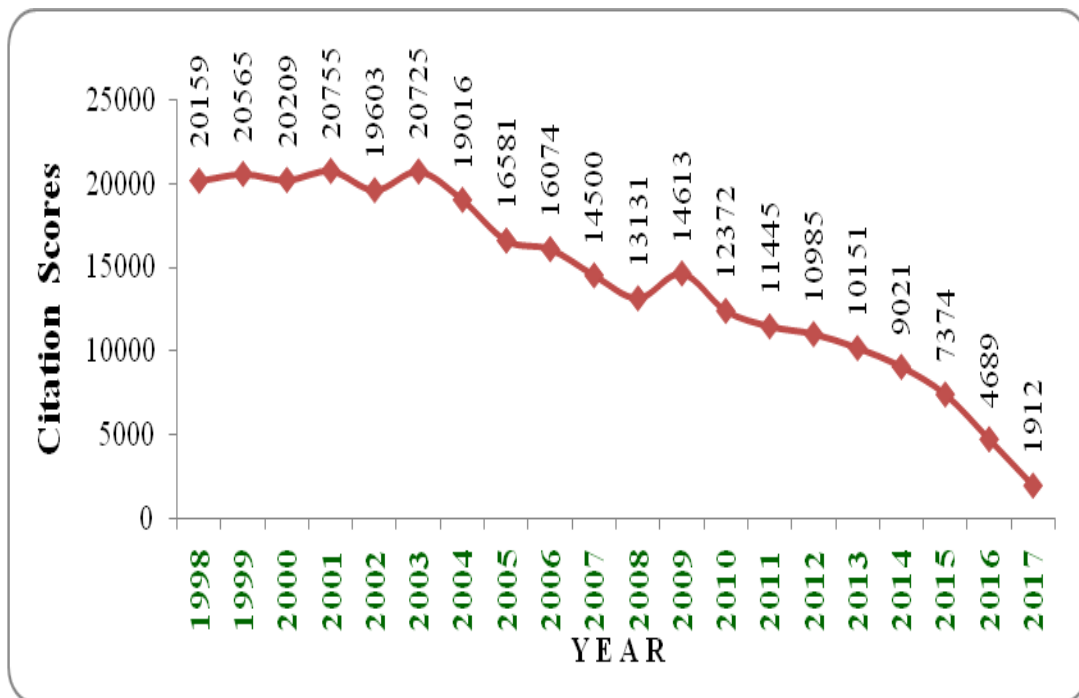


Figure 2: Year- wise Citation Scores on Eosinophilia Research

Table 2: Distribution of Year -wise Cited Records, Number of Authors & H-index in Eosinophilia Productivity

S. No	Year	Records	CR	ACRPA	NA	AAPA	H-index
1	1998	444	14094	31.74	2361	5.32	69
2	1999	563	17037	30.26	2860	5.08	76
3	2000	514	16743	32.57	2652	5.16	72
4	2001	508	16725	32.92	2668	5.25	75
5	2002	520	15741	30.27	2870	5.52	70
6	2003	545	17130	31.43	3054	5.60	72
7	2004	480	15778	32.87	2603	5.42	68
8	2005	553	18971	34.31	3223	5.83	67
9	2006	564	17970	31.86	3100	5.50	60
10	2007	575	17910	31.15	3186	5.54	62
11	2008	567	18101	31.92	3195	5.63	56
12	2009	618	20558	33.27	3433	5.56	58
13	2010	611	18419	30.15	3607	5.90	53
14	2011	641	19534	30.47	3794	5.92	47
15	2012	675	22662	33.57	4095	6.07	47
16	2013	706	20320	28.78	4143	5.87	46
17	2014	765	24112	31.52	4836	6.32	42
18	2015	749	23848	31.84	4820	6.44	38
19	2016	793	25978	32.76	4895	6.17	28
20	2017	727	22946	31.56	4942	6.80	16
TOTAL		12118	384577	635.22	70337	114.9	1122
Mean		605.9	19228	31.76	3517	5.74	56

CR - Cited References; **NA** - Number of Authors; **ACRPA** – Average cited records per article; **AAPA** – Average Author per article.

Table 2 reveals the values of h- index, Total Cited References and its average values, number of authors and its average authors per article, and its mean values are calculated based on year wise eosinophilia research publications output. It could be noticed that from the above Table 2, totally 12118 records were produced by 70337 authors during the study period of 20 years with h-index values and its current value is 56 on eosinophilia research. Totally 3, 84, 577 references are cited by other scientists and its mean value is 19228 for every year of sampling period and 635.22 citations they

are scored per article. The year 1999 (76) having the highest h- index which is followed by the years 2001(75) was placed second. The year 2000 and 2003 (72) had same h-index values and the year 2017 (16) had very lowest h-index value. 70, 337 authors have contributed for eosinophilia research output during sampling period and its mean value is 3517 per year and the average author per article is 114.9. The year 2016, has got the highest cited references (25978) with 793 records, which is followed by the years 2014 (24112) and 2015 (23848) during the period. The year 2017 has contributed the highest number of authors (4942) on eosinophilia research publication, which is followed by the year 2016 (4895), 2014 (4836) and 2015 (4820) respectively.

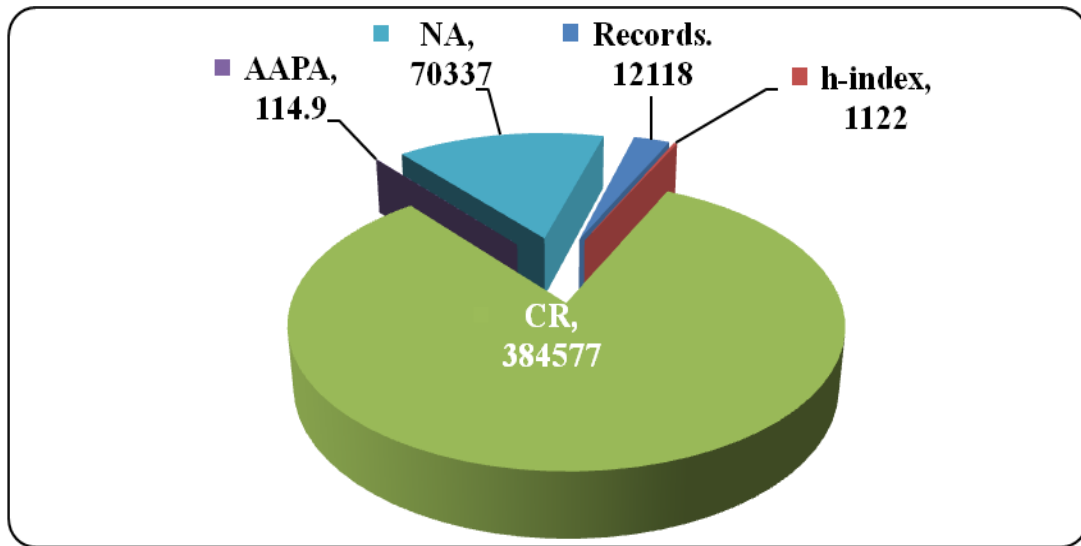


Figure 3: Distribution of Year- wise CR, Number of Authors and H-index

Table 3: Relative Growth Rate and Doubling Time of Eosinophilia Research Output

Year	R. o/p	Cum. o/p	$\log_e I^p$	$\log_e 2^p$	Rt(P)	Dt(P)
1998	444	444	-	6.095		
1999	563	1007	6.095	6.914	0.819	0.846
2000	514	1521	6.914	7.327	0.413	1.678
2001	508	2029	7.327	7.615	0.288	2.406
2002	520	2549	7.615	7.843	0.228	3.039
2003	545	3094	7.843	8.037	0.194	3.572
2004	480	3574	8.037	8.181	0.144	4.813
2005	553	4127	8.181	8.325	0.144	4.813
2006	564	4691	8.325	8.453	0.128	5.414

2007	575	5266	8.453	8.569	0.116	5.974
2008	567	5833	8.569	8.671	0.102	6.794
2009	618	6451	8.671	8.771	0.1	6.930
2010	611	7062	8.771	8.862	0.091	7.615
2011	641	7703	8.862	8.949	0.087	7.966
2012	675	8378	8.949	9.033	0.084	8.250
2013	706	9084	9.033	9.114	0.081	8.556
2014	765	9849	9.114	9.195	0.081	8.556
2015	749	10598	9.195	9.268	0.073	9.493
2016	793	11391	9.268	9.340	0.072	9.625
2017	727	12118	9.340	9.402	0.062	11.177
Total	12118				3.307 (0.17)	117.517 (5.9)

The analysis of growth rate in eosinophilia research output is one of the important aspects of discussion. This analysis aims to identify the trends and growth of prospects in the present research. However, increase in the literature of eosinophilia has made it extremely difficult for scientists to keep in touch with the recent advances in their fields. Hence the provisions of information to information seekers are the prime duty of library professionals, who have to meet the information needs of scientists in various disciplines and policy making.

Table 3 envisages data of relative growth rate and doubling time for total research output on eosinophilia research. The analysis of eosinophilia research output at International visual aid provides the following facts: It is observed that its relative growth rates have contradicted progressively from 0.819 in 1999 to 0.062 in 2017. The overall mean of the RGR is 0.17. Doubling time has rapidly increased from 0.846 in the year 1999 to 11.177 in the year 2017. The mean Doubling time value for the time period is 5.9.

Relative growth rate has shown affluence movement, which means the rate of increase is low in terms of segment, and this has been highlighted by doubling time for publications, which is more than the relative growth rate. Hence the second hypothesis (The relative growth rate of total scientific publications shows a declining trend and the doubling time for publications reflects an increasing trend; There is extensive level of

increase in the growth of eosinophilia research output, indicating the progressive of research performance) noted in chapter 3 has been validated.

Time series forecasting is the use of a model to predict future values based on previously observed values. A straight-line equation is adopted as statistical measure to forecast the trend pattern as suggested by Daya Sridhar. The equation of a straight line is $Y = a + b X$, where X is the time period, say year and Y is the value of the item measured against time, a is the Y intercept and b, the co-efficient of X, indicating the slope of the line. To find a and b, the following ‘normal’ equations are solved.

$$\Sigma Y = aN + b\Sigma X$$

$$\Sigma XY = a\Sigma X + b\Sigma X^2$$

Where N is the number of observation in the series or N = no. of data items.

- ❖ Time Series Analysis for Articles
- ❖ Time Series Analysis for Joint authors
- ❖ Time Series Analysis for Single Authors

Table 4: Time Series Analysis for Articles in Eosinophilia Research

S. No	Year	Records (Y)	X	X ²	XY
1	1998	367	-9.5	90.25	-3486.5
2	1999	433	-8.5	72.25	-3680.5
3	2000	419	-7.5	56.25	-3142.5
4	2001	404	-6.5	42.25	-2626
5	2002	423	-5.5	30.25	-2326.5
6	2003	432	-4.5	20.25	-1944
7	2004	369	-3.5	12.25	-1291.5
8	2005	425	-2.5	6.25	-1062.5
9	2006	417	-1.5	2.25	-625.5
10	2007	400	-0.5	0.25	-200
11	2008	436	0.5	0.25	218
12	2009	448	1.5	2.25	672
13	2010	460	2.5	6.25	1150
14	2011	464	3.5	12.25	1624
15	2012	493	4.5	20.25	2218.5
16	2013	498	5.5	30.25	2739
17	2014	544	6.5	42.25	3536
18	2015	520	7.5	56.25	3900

19	2016	501	8.5	72.25	4258.5
20	2017	455	9.5	90.25	4322.5
Total		$\Sigma Y=8908$	$\Sigma X=0$	$\Sigma X^2=665$	$\Sigma XY=4253$

Straight Line equation $Y_c = a + bX$

Since $\Sigma x = 0$

$$a = \Sigma Y/N = 8908/20 = 445.4; b = \Sigma XY/\Sigma x^2 = 4253/665 = 6.4$$

Estimated literature in 2025 is when $X = 2025 - 2008 = 17$

$$= 445.4 + 6.4 * 17 = \mathbf{554.2}$$

Estimated literature in 2030 is when $X = 2030 - 2008 = 22$

$$= 445.4 + 6.4 * 22 = \mathbf{586.2}$$

Table 4 expects the future publications of Articles on Eosinophilia research output. It is estimated that the publication of Articles will contribute 554.2 in 2025 and 586.2 in 2030.

Table 5: Analysis of Source -Wise Distribution of Eosinophilia Research Output

S. No	Document Types	Records	%	TC	%
1	Articles	8908	73.51	235611	83.00
2	Meeting Abstracts	985	8.13	146	0.05
3	Reviews	978	8.07	34320	12.09
4	Letters	509	4.20	2135	0.75
5	Editorial Materials	399	3.29	3359	1.18
6	Article; Proceedings Paper	300	2.48	7799	2.75
7	Corrections	24	0.20	7	0.00
8	Review; Book Chapters	6	0.05	462	0.16
9	Article; Book Chapters	3	0.02	19	0.01
10	News Items	3	0.02	6	0.00
11	Article; Retracted Publications	2	0.02	15	0.01
12	Reprint	1	0.01	1	0.00
Total		12118	100.00	283880	100.00

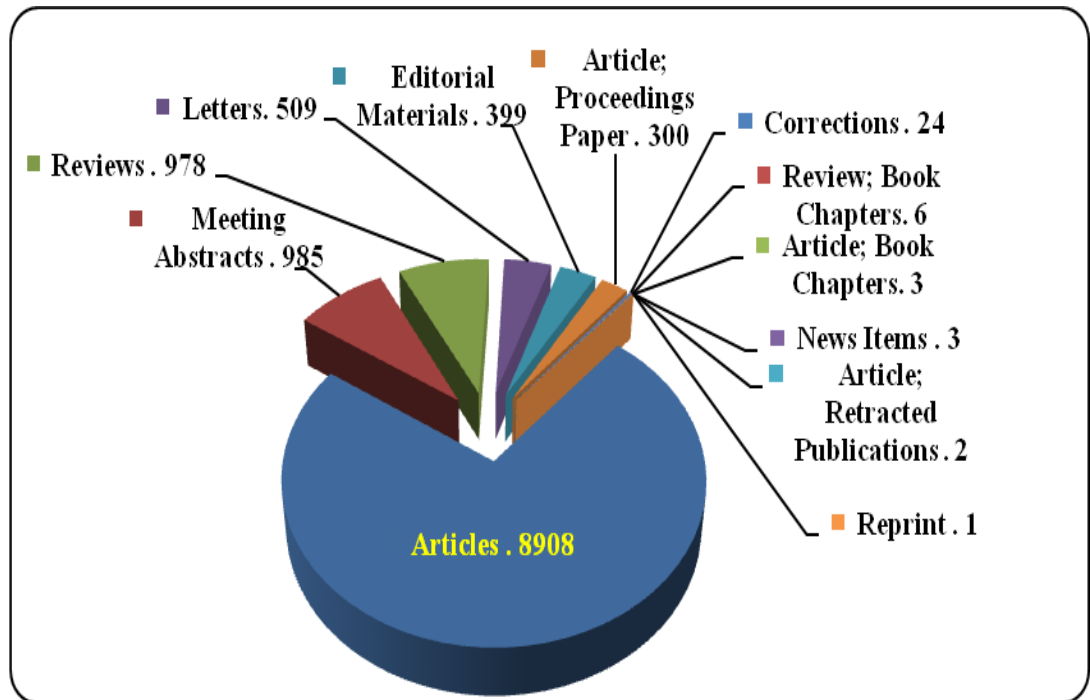


Figure 4: Distribution of Sources in Eosinophilia Research Productivity

The researcher has obtained from the Table 5 exposed that the Articles from journal sources captured the first position for highest 8908 (73.51%) number of publications, these articles have 83 percent of (235611) Total Citation Scores scaled. Next to that, the source of Meeting Abstracts with research publication output takes 985 (8.13%) records along with 146 for TCS, followed by the source of Reviews output takes 978 (8.07%) along with 34320 TCS and Letters have 509 (4.20%) records along with 2135 TCS respectively. The Editorial Materials have 399 (3.29%) records and Article; Proceedings Papers have 300 (3.48%) records. It is quite interesting note that the source of Reprint has very less record (1) with TCS (1).

Table 6: Showing Highest Research Productivity (Top 50) Journals (Totally 1797 Journals)

S. No.	Journals	Country	Records	%	TCS
1	Journal of Allergy and Clinical Immunology	USA	491	11.06	23515
2	Journal of Immunology	USA	371	8.36	24390
3	American Journal of Respiratory and Critical Care Medicine	USA	281	6.33	17811

4	Allergy	UK	250	5.63	5297
5	Clinical and Experimental Allergy	UK	220	4.96	6786
6	Annals of Allergy Asthma & Immunology	USA	165	3.72	1371
7	European Respiratory Journal	France	159	3.58	5455
8	International Archives of Allergy and Immunology	Switzerland	146	3.29	2268
9	Blood	USA	120	2.70	5304
10	Internal Medicine	USA	109	2.46	718
11	American Journal of Respiratory Cell and Molecular Biology	USA	104	2.34	4158
12	Chest	USA	96	2.16	2900
13	PLOS One	USA	96	2.16	1471
14	British Journal of Dermatology	UK	84	1.89	1868
15	Journal of the American Academy of Dermatology	USA	80	1.80	1114
16	Gastroenterology	USA	79	1.78	2956
17	Thorax	UK	74	1.67	3812
18	American Journal of Gastroenterology	USA	67	1.51	2143
19	Journal of Dermatology	Japan	58	1.31	394
20	American Journal of Tropical Medicine and Hygiene	USA	55	1.24	833
21	European Journal of Immunology	Germany	55	1.24	1870
22	Allergy and Asthma Proceedings	USA	54	1.22	557
23	Clinical and Experimental Immunology	UK	54	1.22	1100
24	Annales De Dermatologie Et De Venereologie	Netherlands	53	1.19	427
25	International Immunopharmacology	USA	53	1.19	1323
26	Respiratory Medicine	USA	53	1.19	1171
27	Journal of Asthma	UK	52	1.17	498
28	Respiratory Research	USA	50	1.13	1124
29	Alimentary Pharmacology & Therapeutics	USA	49	1.10	969
30	Journal of Experimental Medicine	USA	49	1.10	7856
31	Journal of Investigational Allergology And Clinical Immunology	Spain	49	1.10	647
32	Immunology and Allergy Clinics of North America	USA	48	1.08	1133
33	Clinical and Experimental Dermatology	USA	45	1.01	545
34	Respirology	Japan	44	0.99	414
35	International Journal of Dermatology	USA	43	0.97	487
36	American Journal of Hematology	USA	42	0.95	593
37	Infection and Immunity	USA	42	0.95	1463
38	Leukemia & Lymphoma	Israel	42	0.95	355
39	Revue De Medecine Interne	France	42	0.95	237
40	Pediatric Allergy And Immunology	German	40	0.90	917
41	Clinical Infectious Diseases	USA	39	0.88	959

42	Journal of Virology	USA	39	0.88	1638
43	European Journal of Dermatology	UK	38	0.86	566
44	Journal of Allergy and Clinical Immunology-In Practice	USA	38	0.86	264
45	Journal of The European Academy of Dermatology and Venereology	Switzerland	38	0.86	437
46	American Journal of Physiology-Lung Cellular and Molecular Physiology	USA	37	0.83	1262
47	Laryngoscope	USA	37	0.83	888
48	Vaccine	Japan	37	0.83	776
49	Archiveso Dermatology	USA	36	0.81	1084
50	American Journal of Rhinology & Allergy	USA	35	0.79	413
Total			4438	100.00	146537

Among all the above journals (1797), top 50 journals which are familiar contribute for 36.62% (4438) of research outputs. A Large number of publications 491 (11.06%) are published by the journal “Journal of Allergy and Clinical Immunology” with 23515 TCS and the journal “Journal of Immunology” published 371(8.36%) publications with 24390 TCS scaled. This is followed by “American Journal of Respiratory and Critical Care Medicine”, “Allergy”, and “Clinical and Experimental Allergy” with 281, 250 and 220 publications with 17811, 5297 and 6786 got the Total citations scores respectively. More than fifty percent of the Journal publications are from the country USA and only 11 journals have produced more than 100 publications and the remaining below 100 publications.

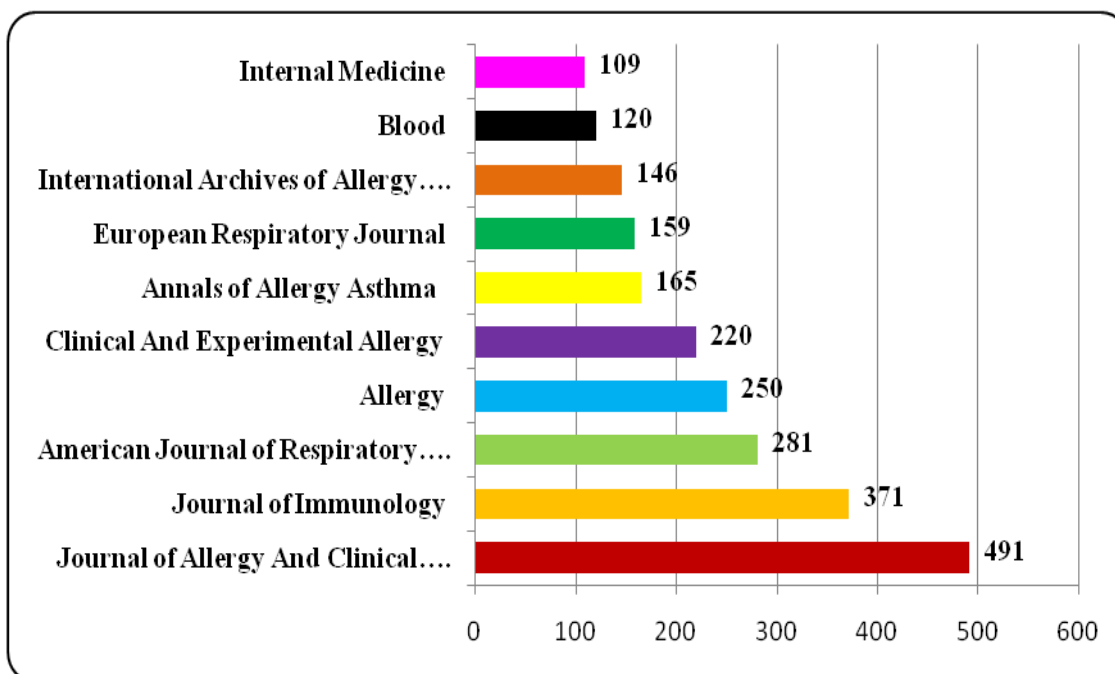


Figure 5: Showing Highest Research Productivity (top 10) Journals

Table 7: Showing Journals according to Highest Citation with Impact Factor (top 50)

S. No.	Journals	Records	TCS	IF
1	Journal of Immunology	371	24390	4.856
2	Journal of Allergy and Clinical Immunology	491	23515	13.258
3	American Journal of Respiratory and Critical Care Medicine	281	17811	15.24
4	Journal of Experimental Medicine	49	7856	10.790
5	Clinical And Experimental Allergy	220	6786	5.158
6	New England Journal of Medicine	34	5939	79.258
7	European Respiratory Journal	159	5455	12.242
8	Blood	120	5304	13.164
9	Allergy	250	5297	6.048
10	Journal of Clinical Investigation	26	4286	13.251
11	American Journal of Respiratory Cell & Molecular Biology	104	4158	3.79
12	Thorax	74	3812	9.655
13	Lancet	20	3036	53.254
14	Gastroenterology	79	2956	20.877
15	Chest	96	2900	7.132

16	Proceedings of The National Academy of Sciences of The United States of America	27	2328	9.661
17	Immunity	14	2312	19.734
18	International Archives of Allergy & Immunology	146	2268	2.437
19	Science	3	2200	37.205
20	American Journal of Gastroenterology	67	2143	10.383
21	American Journal of Surgical Pathology	34	2047	5.145
22	European Journal of Immunology	55	1870	5.179
23	British Journal of Dermatology	84	1868	6.129
24	Journal of Virology	39	1638	4.663
25	Leukemia	27	1575	12.104
26	Clinical Gastroenterology & Hepatology	22	1522	7.896
27	Journal Of Pharmacology & Experimental Therapeutics	32	1495	3.867
28	PLOS ONE	96	1471	2.766
29	Infection And Immunity	42	1463	3.731
30	Nature Medicine	6	1390	32.621
31	Annals of Allergy Asthma & Immunology	165	1371	2.599
32	Journal of Pediatric Gastroenterology & Nutrition	35	1325	2.799
33	International Immunopharmacology	53	1323	3.118
34	American Journal of Physiology-Lung Cellular & Molecular Physiology	37	1262	4.092
35	Respiratory Medicine	53	1171	3.230
36	Immunology & Allergy Clinics of North America	48	1133	3.694
37	Respiratory Research	50	1124	3.841
38	Journal of The American Academy of Dermatology	80	1114	6.898
39	Clinical & Experimental Immunology	54	1100	3.409
40	American Journal of Pathology	27	1084	4.069
41	Archives of Dermatology	36	1084	8.107
42	International Immunology	23	1052	3.403
43	Alimentary Pharmacology & Therapeutics	49	969	7.357
44	Nature Reviews Immunology	2	963	39.932
45	Clinical Infectious Diseases	39	959	9.117
46	Journal of Leukocyte Biology	31	936	4.289
47	American Journal of Medicine	15	933	5.003
48	Pediatric Allergy & Immunology	40	917	4.137
49	British Journal of Hematology	24	907	5.67
50	Laryngoscope	37	888	2.471

The Table 7 exhibits the analysis on ranking of top 50 highly cited journals among 1797 total journals for the study period that was contributed on eosinophilia. It

could reveal that the journal, ‘Journal of Immunology’ (24390), ‘Journal of Allergy and Clinical Immunology’ (23515) and ‘American Journal of Respiratory and Critical Care Medicine’ (17811) scored first three positions both in publications productivity and citations. Few journals were in lower position in terms of publications below 100 and it got higher citations, which are, ‘Journal of Experimental Medicine’ (49), ‘New England Journal of Medicine’ (34) and ‘Journal of Clinical Investigation’ (26) have got higher citations on 7856, 5939 and 4286 respectively. It is quite interesting to note that the journals ‘Science’ and ‘Nature Medicine’ have published 3 and 6 publications during the study period and it got 2200 and 1390 citations respectively.

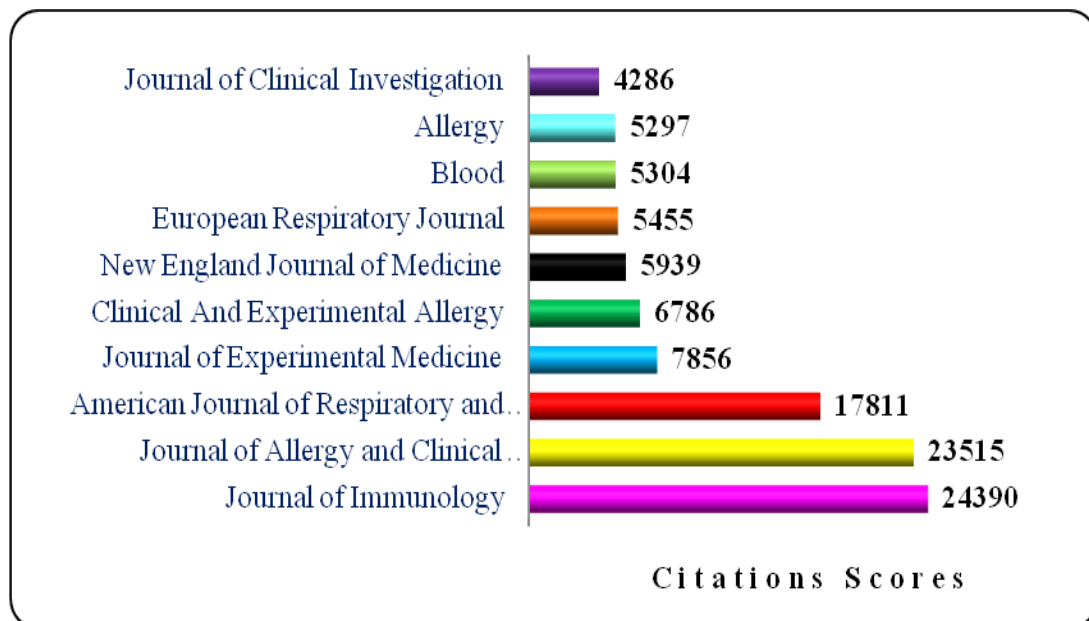


Figure 6: Showing top 10 Journals according to Highest Citations

The top 50 high productive journals have the Impact Factor from 2.437 to 79.258, the Journal ‘New England Journal of Medicine’ got the highest impact factor of 79.258; the journal of ‘Lancet’ got the impact factor 53.254 it is second position; there are 3 journals with more than the Impact Factor of 30; while 10 journals with Impact Factor between 10 to 20; remaining journals having Impact Factor less than 10. Among the top 50 high productivity research journals that contribute on eosinophilia research, while the journal ‘International Archives of Allergy & Immunology’ has the lowest impact factor of 2.437.

Table 8: Keyword Analysis on Eosinophilia Research (10929)

S. No	Word	Records	Percent	TCS
1	Eosinophilia	3175	10.45	39334
2	Asthma	1365	4.49	52601
3	Eosinophilic	1335	4.39	33312
4	Syndrome	1303	4.29	19911
5	Induced	1202	3.96	27404
6	Airway	1123	3.70	48040
7	Allergic	1073	3.53	36247
8	Inflammation	896	2.95	38868
9	Disease	882	2.90	21693
10	Patients	808	2.66	20124
11	Case	807	2.66	4993
12	Associated	769	2.53	13509
13	Drug	679	2.23	8768
14	Cell	673	2.21	19545
15	Chronic	641	2.11	18627
16	Mice	606	1.99	18523
17	Systemic	547	1.80	7738
18	Cells	538	1.77	21595
19	Pulmonary	533	1.75	15573
20	Clinical	532	1.75	11934
21	Model	512	1.69	15659
22	Treatment	509	1.68	15287
23	Report	493	1.62	3301
24	Acute	458	1.51	7278
25	Symptoms	457	1.50	5289
26	Infection	449	1.48	10850
27	Eosinophil	421	1.39	12522
28	Lung	412	1.36	13750
29	Eosinophils	387	1.27	15368
30	Children	356	1.17	10081
31	Severe	355	1.17	9978
32	Allergen	346	1.14	12389
33	Patient	345	1.14	2310
34	Dress	343	1.13	3489
35	Responses	340	1.12	12092
36	Review	335	1.10	6793
37	Role	333	1.10	13072
38	Interleukin	331	1.09	13440
39	Expression	330	1.09	11962
40	Murine	327	1.08	10745
41	Response	327	1.08	11520
42	Reaction	324	1.07	3058

43	Human	317	1.04	9750
44	Blood	315	1.04	4736
45	Effects	311	1.02	10731
46	Respiratory	308	1.01	8854
47	Hypereosinophilic	305	1.00	7145
48	Virus	286	0.94	8102
49	Churg	283	0.93	4742
50	Strauss	283	0.93	4742

Table 8 displays the analysis of keywords used in eosinophilia research output. The above Table lists the first 50 keywords that have got coverage in 200+ records. The most often used keyword is 'eosinophilia' which occurred in 3175 records with 39334 Citation Scores. This is followed by the term 'Asthma' which occurred in 1365 publications 52601 Citation Scores. The publications used the key terms such as 'Eosinophilic' (4.39%), 'Syndrome' (4.9%), 'Induced' (3.96%), and 'Allergic' (3.53%) and so on. From the above analysis, the research related keywords, Eosinophilic, Eosinophil, Eosinophils occurs single place and published in different publications.

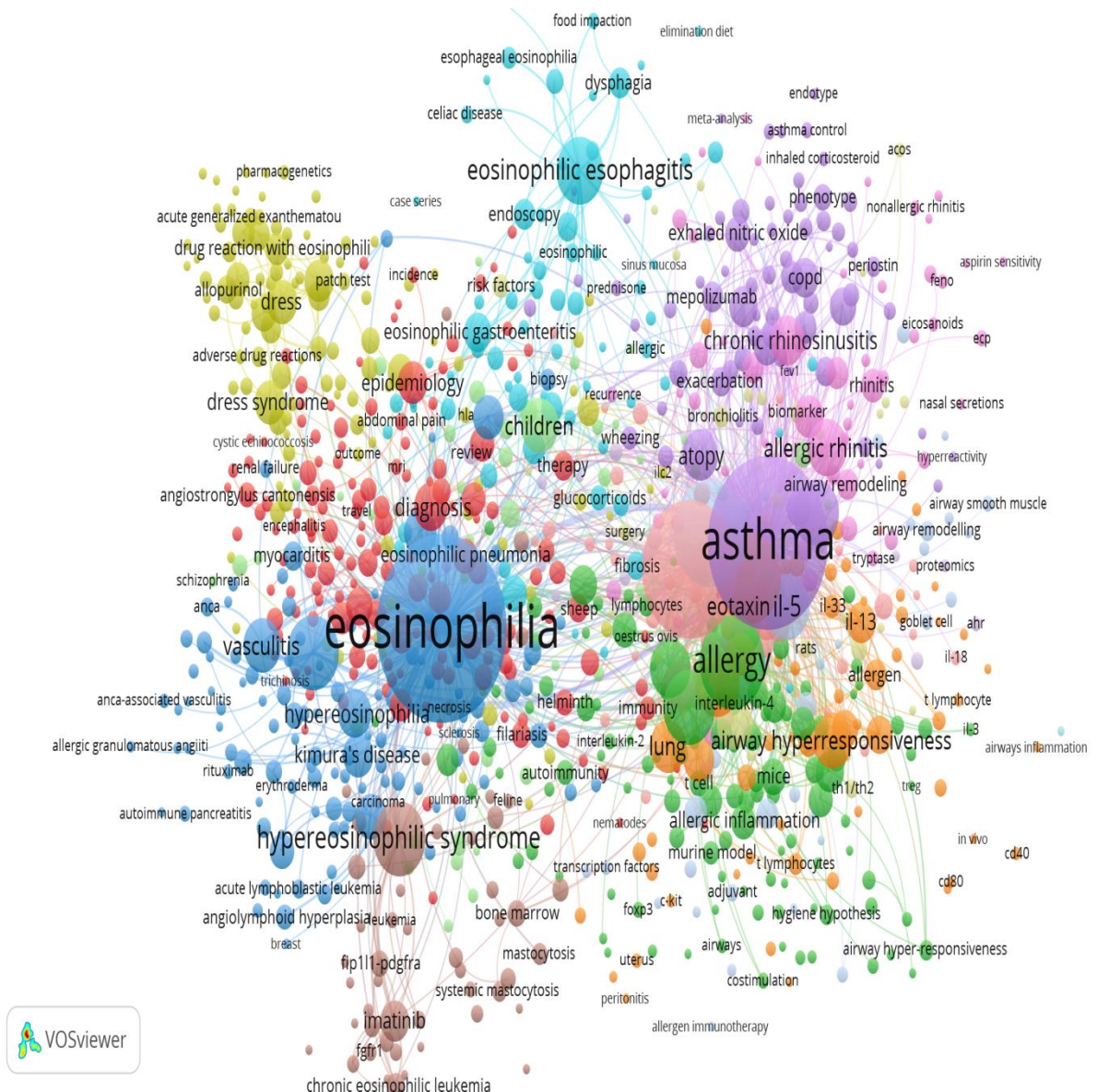


Figure 7: Co-occurrence of Keywords

6. Major Findings and Conclusion

This study has analyzed 12118 publications with 283880 global citation scores captured on Eosinophilia indexed and cited in the Web of Science database during 1998-2017. The highest number of 973 publications which received 4689 citation scores in 2016. The average number of publications per year was 606. The year 1998 has 444 publications with 20159 citations; it stood with lowest publications in the study period. Totally 3, 84, 577 references are cited by other scientists and its mean value is 19228 for every year of sampling period and 635.22 citations they are scored per article. The year

1999 having the highest h-index measured 76. The articles constituted 73.51% share (8908 Papers) of the total world publications on eosinophilia research during 1998-2017, followed by Meeting Abstracts 8.13%, (985 papers), Reviews 8.07%, (978 papers), letters 4.20 (509 papers), Editorial Materials 3.29% (399 papers) respectively.

Researchers preferred to publish in journals and the highly cited journals in the field were: *Journal of Allergy and Clinical Immunology*, USA has published the highest number of 491 publications with 23515 global citations. It's got the first position among the 1797 journals. Followed by the *Journal of Immunology*, USA has published 371 publications with 24390 citations and *American Journal of Respiratory and Critical Care Medicine*, USA has published 281 publications with 17811 citations. The research findings will be helpful to the individual researchers, the research institutions, the funding bodies and the government in taking certain decisions in respect of Eosinophilia research that needs to be conducted in particular geographical and medical environment. Though the number of Eosinophilia infected cases reported in various geographical regions is very less, the Eosinophilia research activities should be continued to explore new ways or improvise the presently used ways to curb the occurrence of the deadly contagious disease again in this earth.

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