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Scientometric Analysis of Endocrinology Research Publications (1993-2012) : A Global Prospective

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ABSTRACT

The present study discuss on Scientometric analysis of Endocrinology research publication during 1993-2012: A Global prospective. This study reveals that, year wise research output shows that on increasing and digress during the study period. Document wise output shows that Erratum type has more number of records in Endocrinology research and next position has articles. Journal of Clinical Endocrinology and Metabolism has 27.20 per cent of records. Single authors Contributions are less compare with Collaborative authors contributions. Further this study found that Martino, E. has published more number of publications in Endocrinology research during the study period.

KEYWORDS Endocrinology, Scientometric analysis, Hormones, Metabolism.

Introduction

Endocrinology is the study of hormones; but what are hormones? The question is for more difficult to answer today than it was a few decades ago. The classic definition is that hormones are chemical substances produced by specialized tissues and secreted into blood. Where they are carried to target organs (Bolander, Jr Franklyn. F,2004). Accordingly, the practice of endocrinology is intimately linked to a conceptual framework for understanding hormone secretion, hormone action, and principles of feedback control systems. The endocrine system is evaluated primarily by measuring hormone concentrations, there by arming the clinician with valuable diagnostic information. The specialty of endocrinology encompasses the study of glands and the hormones the produce (Jameson, J. Larry (2006).

Materials and Methods

The data were collected from Scopus database; the study period is during (1993-2012). The search string were used 'Endocrinology' in the Title, further the Abstract and Keyword field were used to extract publications related to Endocrinology. A total of 2875 publications, the data were retrieved, downloaded and analysed by using the Microsoft Office Excel spreadsheet.

Objectives

The following objectives of the study are;

- To find growth of Endocrinology research
- To identify document wise research publication
- To find top most productivity authors
- To examine distribution of top most productivity countries
- To identify top most productive institutions in Endocrinology research.

Analysis and Interpretation

Figure 1 Year wise research output on Endocrinology

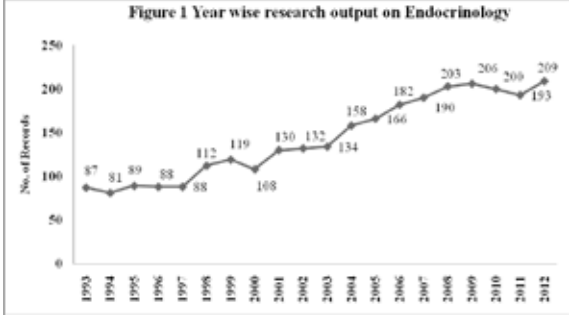


Figure 1 show that, year wise research output in endocrinology research, in the year 2012 has occupies first with position published 209 records, 2009 have occupies second position with 206 records, in the year 2008 have occupies third place with 203 records, followed by in 2010 has 200 records, in 2011 has 193 records, 2007 has 190 records, in 2006 has 182 records, in 2005 has 166 records, 2004 has 158 records, in 2004 has 158 records, in 2003 has 134 records, 2002 have published 130 records, in the year 2000 has published 108 records, in 1999 has 119 records, 1998 has published 112 records, in 1997 and 1996 has 88 records each year, in 1995 has published 89 records, 1993 has 87 records and in the year 1993 has published 81 records. It could be noted that among the study period, it has showing increasing and decreasing in year wise research output.

Table 1 Document type wise research output in endocrinology research

Sl. No.	Document Type	# of Records	Percentage
1	Erratum	782	27.20
2	Article	659	22.92
3	Review	410	14.26
4	Conference Paper	404	14.05
5	Editorial	333	11.58
6	Short Survey	122	4.24
7	Note	105	3.65
8	Letter	39	1.36
9	Book Chapter	15	0.52
11	Book	6	0.21
	Total	2875	100.00

Table 1 shows that, document wise endocrinology research output, among the eleven document types, Erratum have first position with 782 records, Article has second position with 659 records, Review has third position with 410 records, followed by Conference Paper has 404 records, Editorial has 333 records, Short Survey has 122, Note has 105, Letter has 39, Book Chapter has 15 records, and Book has 6 records with eleventh position.

Table 2 Sources wise research output in endocrinology

Sl. No.	Source Type	# of Records	Percentage
1	Journals	2828	98.37
2	Book Series	26	0.90
3	Books	21	0.73
	Total	2875	100.00

Table 2 indicates that, sources wise research output in endocrinology. Among the three sources journals has occupies with 98.37 percent of records, followed by Book Series has 26 records, and Books has 21 records.

Table 3 top ten countries in endocrinology research output

Sl. No.	Country	# of Records	Percentage of 2875
1	United States	538	18.71
2	Germany	170	5.91
3	United Kingdom	163	5.67
4	France	103	3.58
5	Spain	70	2.43
6	Canada	68	2.37
7	Italy	64	2.23
8	Australia	59	2.05
9	Japan	54	1.88
10	Switzerland	45	1.57

Table 3 shows that, top ten countries contributing endocrinology research. 2875 records were published by 69 countries, among the 69 countries United States have occupies first position with 538, Germany has Second position with 170 records, United Kingdom has contributing 163 records, followed by France has 103 records, Spain has 70 records, Canada has 68 records, Italy has 64 records, Australia has 59 records, Japan has 54 records and Switzerland has tenth position with 45 records in endocrinology research. The remaining 59 countries were published less than 45 records in endocrinology research publications. India have published 9 records in endocrinology research, India has occupies twenty seventh position.

Table 4 top ten sources published in endocrinology research

Sl. No.	Source Title	# of Records	Percentage of 2875
1	Journal of Clinical Endocrinology and Metabolism	264	9.18
2	Endocrinology	140	4.87
3	European Journal of Endocrinology	83	2.89
4	Molecular Endocrinology	77	2.68
5	General and Comparative Endocrinology	74	2.57
6	Clinical Endocrinology	74	2.57
7	Molecular and Cellular Endocrinology	72	2.50
8	Journal of Endocrinological Investigation	69	2.40
9	American Journal of Physiology Endocrinology and Metabolism	68	2.37
10	Journal of Endocrinology	68	2.37

Totally 2875 records were published in Endocrinology by 515 sources. Table 4 indicates that, only top ten source in endocrinology research publications, 'Journal of Clinical Endocrinology and Metabolism' has occupies first place with 264 records, 'Endocrinology' has second place with 140 records, and 'European Journal of Endocrinology' has third position with 83 records. Followed by 'Molecular Endocrinology' has published 77 records it has fourth place, 'General and Comparative Endocrinology' and 'Clinical Endocrinology' has fifth and sixth position, 'Molecular and Cellular Endocrinology' has 72 records, 'Journal of Endocrinological Investigation' has 69 records, 'American Journal of Physiology Endocrinology and Metabolism' has ninth position and 'Journal of Endocrinology' has occupies with tenth position with 68 records. The remaining 505 records were published less than 68 records.

Table 5 top ten productive authors

Sl. No.	Authors name	# of Records	Percentage of 2875
1	Martino, E.	37	1.29
2	Laron, Z.	20	0.70
3	Wilson, C.	12	0.42
4	Dores, R.M.	11	0.38
5	Lehnert, H.	10	0.35
6	Savage, M.O.	10	0.35
7	Garber, A.J.	9	0.31
8	Lyte, M.	8	0.28
9	Schreiber, V.	8	0.28
10	Burger, H.G.	8	0.28

Table 5 indicates that, top ten authors' contributions in Endocrinology research. Totally 2875 records were published by 1033 authors in Endocrinology research during the study period of 1993-2012. Martino, E. have occupies first position with 37 records, Laron, Z. has 20 with second position, Wilson, C. has third position with 12 records, followed by Dores, R.M. has 11 records, Lehnert, H. and Savage, M.O. has 10 records each Garber, A.J. has 9 records, and Lyte, M., Schreiber, V., and Burger, H.G. has occupies eighth, ninth and tenth position.

Table 6 Single Vs Multi authored papers

Sl. No.	Year	Single authored	Percentage	Multi authored	Percentage	Total
1	1993	45	1.57	42	1.46	87
2	1994	35	1.22	46	1.60	81
3	1995	36	1.25	53	1.84	89
4	1996	28	0.97	60	2.09	88
5	1997	39	1.36	49	1.70	88
6	1998	52	1.81	60	2.09	112
7	1999	67	2.33	52	1.81	119
8	2000	49	1.70	59	2.05	108
9	2001	71	2.47	59	2.05	130

Sl. No.	Year	Single authored	Percentage	Multi authored	Percentage	Total
10	2002	61	2.12	71	2.47	132
11	2003	63	2.19	71	2.47	134
12	2004	76	2.64	82	2.85	158
13	2005	72	2.50	94	3.27	166
14	2006	74	2.57	108	3.76	182
15	2007	64	2.23	126	4.38	190
16	2008	75	2.61	128	4.45	203
17	2009	78	2.71	128	4.45	206
18	2010	87	3.03	113	3.93	200
19	2011	83	2.89	110	3.83	193
20	2012	89	3.10	120	4.17	209
	Total	1244	43.27	1631	56.73	2875

Table 6 indicates the proportion of single author Vs multi authored papers in Endocrinology research publications. Total 2875 records were published in Endocrinology research, 43.27 per cent of records have published single authored distribution and the rest 56.73 per cent of them are multi authored distribution on Endocrinology. Compared with the single author works, multi authored contributions are very high. The keen observation of the table 6 indicates that, multi authored distribution is very high level compared to single author contribution of the Endocrinology research output. Concluded from table 6, overall output of author's contribution of single author level as well as at multi authored level is increasing and decreasing trend.

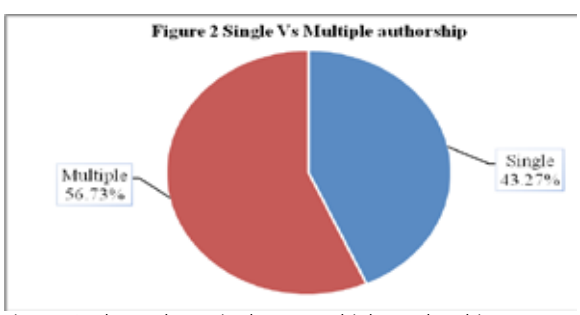


Figure 2 show that, single Vs multiple authorship pattern, multiple authors papers were high with 56.73 percentage and single authors papers are 43.27 percentages in endocrinology research.

Table 7 top ten authors' affiliations in endocrinology research

Sl. No.	Authors' affiliation	No. of Records	% of 2875
1	Universita di Pisa	41	1.43
2	University of Pittsburgh School of Medicine	14	0.49
3	Mount Sinai School of Medicine	14	0.49
4	University of California, San Francisco	13	0.45
5	Erasmus University Medical Center	13	0.45
6	Harvard Medical School	12	0.42
7	Hapitaux universitaires de Genave	12	0.42
8	Brigham and Women's Hospital	12	0.42
9	Katholieke Universiteit Leuven	12	0.42
10	UC Davis	11	0.38

Table 7 shows that, top ten authors affiliation in endocrinology research during 1993-2012. Universita di Pisa has occupies the first position with 41records in endocrinology research among the institutions. Followed by University of Pittsburgh School of Medicine and Mount Sinai School of Medicine has published each 14 records, University of California, San Francisco, and Erasmus University Medical Center has published 13 records each. Harvard Medical School, Hapitaux universitaires de Genave, Brigham and Women's Hospital, and Katholieke Universiteit Leuven has 12 records each, and UC Davis has published 11 records. The remaining institutions were published less than 11 records.

Relative Growth Rate and Doubling Time

Relative Growth Rate (RGR)

The Relative Growth Rate is the increase in the number of publications/pages per unit of time. Here, one year is taken as the unit of time. The mean relative growth rate R (1-2) over a specified period of interval can be calculated from the following equation suggested by Mahapatra (1985).

$$R(1\text{-}2) = \frac{W_2 - W_1}{T_2 - T_1}$$

where,

R = Mean relative growth rate over the specific period of interval

W_1 = log w_1 (Natural log of initial number of publications/pages)

W_2 = log w_2 (Natural log of initial number of publications/pages)

T_2-T_1 = the unit difference between the initial time and final time.

Therefore,

R (a) = Relative growth rate per unit of publications per unit of time (year)

R (p) = Relative growth rate per unit of pages per unit of time (year)

Doubling Time (DT)

A direct equivalence exists between the Relative Growth Rate and Doubling Time. If the number of publications/pages of a subject doubles during a given period, then the difference between the logarithms of the numbers at the beginning and at the end of the period must be the logarithms of the number 2. This difference has a value of 0.693. Thus, the corresponding doubling time for publication and pages can be calculated by the following formula:

$$\text{Doubling time (Dt)} = \frac{0.693}{R}$$

Therefore,

$$\text{Doubling time for publications Dt (a)} = \frac{0.693}{R(a)}$$

Table 8 Relative Growth Rate (RGR) and Doubling Time (DT) of Endocrinology publication

Sl. No.	Year	No. of Records	Cumulative	W1	W2	R (a)	Mean (a) 1-2	Doubling Time	Mean dt (a) 1-2
1	1993	87	87		4.46	-			
2	1994	81	168	4.46	5.12	0.66		1.05	
3	1995	89	257	5.12	5.54	0.42		1.65	
4	1996	88	345	5.54	5.84	0.3		2.31	
5	1997	88	433	5.84	6.07	0.23		3.01	
6	1998	112	545	6.07	6.3	0.23	0.69	3.01	3.18
7	1999	119	664	6.3	6.49	0.19		3.65	
8	2000	108	772	6.49	6.64	0.15		4.62	
9	2001	130	902	6.64	6.8	0.16		4.33	
10	2002	132	1034	6.8	6.94	0.14		4.95	
11	2003	134	1168	6.94	7.06	0.12		5.78	
12	2004	158	1326	7.06	7.18	0.12		5.78	
13	2005	166	1492	7.18	7.3	0.12		5.78	
14	2006	182	1674	7.3	7.42	0.12		5.78	
15	2007	190	1864	7.42	7.53	0.11		6.30	
16	2008	203	2067	7.53	7.63	0.1	0.1	6.93	7.03
17	2009	206	2273	7.63	7.72	0.09		7.70	
18	2010	200	2473	7.72	7.81	0.09		7.70	
19	2011	193	2666	7.81	7.88	0.07		9.90	
20	2012	209	2875	7.88	7.96	0.08		8.66	
	Total	2875					0.39		5.1

Table 8 indicates the relative growth rate of research output in Endocrinology. The mean relative growth rate for the period 1993to 2002 is worked out to 0.69 and it is 0.1 for the period 2003 to 2012. The overall study period has witnessed a mean relative growth rate of 0.39. Moreover the mean doubling time for the period 1993 to 2002 is worked out value is 3.18 and for the period 2003 - 2012 which is calculated value is 7.03, and doubling time mean value 5.1 during thought the study period.

Conclusion

Conclude from the present study, year wise research output shows that on increasing and degreasing trend in Endocrinology research publication. Further it indicates that document types in Endocrinology research, Erratum have first position with 782 records, article has second position with 659 records; Review has third position with 410 records. In sources wise research output on endocrinology journals has occupies first position with 98.37 percent of records. Totally 515 sources were published 2875 records among the sources 'Journal of Clinical Endocrinology and Metabolism' has occupies first place with 264 records. In this study compare with single Vs multiple authorship pattern, the multiple authors papers were more. It found that the relative growth rate of research output in Endocrinology shows that the doubling time mean value 5.1 during thought the study period.

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