Scientometric Analysis of Research Paper Published on Journal of Thoracic Oncology during 2006-2015

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Abstract - **This Scientometric analysis based on total 13888 research publications published in the Journal of Thoracic Oncology (JTO) during the selected ten years between 2006 and 2015. Source and citation data have been downloaded from the Web of Science (WoS) database of Thomson–Reuters. Histcite software is used to analysis the dataset; the analysis covers parameters like most productive authors, word frequency, document type, ranking of institution and countries. Additionally the citespace software is utilized to analysis the article for knowledge mapping.**
Keywords: Citation, Citespace, Content analysis, Histcite, Most Productive Author, Oncology, Scientometric analysis.

I. INTRODUCTION

Scientometrics is one of the qualitative as well as quantitative studies in the field of Library and Information Science. In this present study examined the scientometric analysis of research papers published in the journal of thoracic oncology (JTO), which has been recognized as one of the important journals in the field of oncology. As spoken in the scope of JTO, it has been recognized as an official journal of the international association for the study of lung cancer, is the essential instructive and informational publication for topics relevant to detection, prevention, diagnosis, and treatment of thoracic malignancies. Scientometrics analysis has been utilized by many research scholars to investigate conceptual network in different discipline in the most recent couple of decades. For this study, we have chosen a few of them and displayed here.

Velmurugan and Radhakrishnan, (2016) [1] in their report analyzed growth pattern and recent research trends of Phytochemistry. Senthilkumar R, Muthukrishnan M, (2016)[2] in their report analyzed the authorship patterns and collaborative research of oncology research output in India. Senthilkumar R, Muthukrishnan M, (2016) [3] this paper presents bibliometric analyses of 14553 articles published in pediatric blood and cancer (PBC) during 2005-2015. Santosh A Navalur, R Balasubramani, (2015) [4] this study, analyzes the global research output in the field of E-learning.

Singhai Monika & Gautam J. N, (2015) [5] in this paper presents bibliometric analyses of article published in Indian journal of cancer during 2005-2009. Ravikumar, Agrahari,

& Singh, (2014)[6] this paper reports a co-word analysis of the journal Scientometrics (2005–2010). Yao et al., (2014) [7]this study aims to review and analysis the global progress in HSR and the current quantitative trends. McKerlich, Ives, & McGreal, (2013) [8]the present paper examines the intellectual structure of HRM: a bibliometric analysis of the journal HRM, 1985 to 2005. Biglu, Eskandari, & Asgharzadeh, (2011) [9] the present paper observes scientometric analysis of nanotechnology in MEDLINE during a period of 10 years 2001-2010. Rajendran, Jeyshankar, & Elango, (2011) [10]in their report Scientometric analysis of 633 research articles published in Journal of Scientific and Industrial Research has been carried out. Tsay, (2011) [11]this study is to explore the journal bibliometric characteristics of the Journal of Information Science (JIS). Van Eck & Waltman, (2011) [12] this article looks at text mining and visualization using VOS viewer. Dixit, S Katare, (2007) [13] this study, a bibliometric analysis of the 'Journal of the Indian Society for Cotton Improvement' (1995-2004). Willett, (2007) [14] this paper reviews the articles published in the Journal of Molecular Graphics and Modelling. Eaton, Ward, Kumar, & Reingen, (1999) [15] this study examines the relation between author productivity and the network structure of the journals from 1977 to 1996.

II. OBJECTIVES

Scientometric methods were used to analysis the research publications published in the Journal of Thoracic Oncology (JTO) during the selected ten years between 2006 and 2015. The objectives of the present study are:

1. Find out the keyword frequency and document type of the research publications.
2. Analysis the ranking of contributors of articles.
3. Analyses the most productive author and institutions.

III. DATA ANALYSIS

This analysis has been made in the Journal of Thoracic Oncology (JTO) which fall under the framed period. A total of 13888research publications was downloaded from the Web of Science (WoS) database by Thomson Reuters. The

search string used "Journal of Thoracic Oncology" in the Publication Name" field for the year 2006-2015 to retrieve the data. Further the records analyzed by using Histcite and Citespace software application.

TABLE 1 DOCUMENT TYPE OF PAPERS IN JTO IN TEN SELECTED YEARS

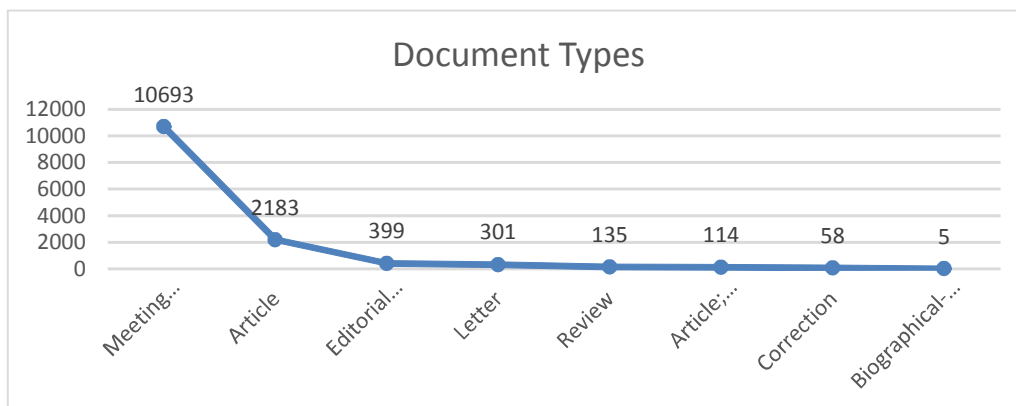| S.No.	Document Type	Records	%	TLCS	TGCS
1	Meeting Abstract	10693	77	115	1417
2	Article	2183	15.7	3044	39401
3	Editorial Material	399	2.9	169	1807
4	Letter	301	2.2	44	549
5	Review	135	1	346	5039
6	Article; Proceedings Paper	114	0.8	211	2631
7	Correction	58	0.4	1	16
8	Biographical-Item	5	0	0	0

Fig.1 Document types of papers in JTO in ten selected years

The data presented in Table 1and Fig.1 which gives the types of document wise distribution of publication and their citation information. It is clearly noticed from the table that the major source of records published in the form of meeting abstracts 10693 (77%), followed by articles and editorial material with 2183 (15.7%) and 399 (2.9%) having global citation scores of 39401 and 1807, local citation scores of 3044 and 169 respectively.

Table 2 shows the ranking of contributors of articles. During the rank run down the authors who have contributed 85 articles or more are measured into account to avoid a very long list. It was observed that there is a total of 34534 of authors for 13888publications and it shows the top 15 most productive authors during, 2006-2015. Hirsch FR contributed 124 articles and followed by Park K118 articles, Shepherd FA 114 articles, Rosell R112 articles, Novello S107 articles. Others have contributed less than 100 articles during the period of study.

A Citation Map is a visual presentation that shows the citation relationships (cited references and citing articles)

between Citation Map of the most productive authors who published 124 articles with 216 TLCS and 2502 TGCS. His article "Epidermal Growth Factor Receptor Inhibition in Lung Cancer Status 2012" Journal of Thoracic Oncology 8 (3): 373-384 reached 53 citations. The above map, the most productive author is shown in the middle of the Citation map panel. To the right side of the authors (forward mapping view) cite the original paper (citing articles). To the left side of the authors (backward mapping view) are cited by the most productive author (cited references).

In all, 102 countries participated in research during 2006 to 2015, of which contributions of top 20 countries are listed in Table 3 and Graph 03. The major contribution to research comes from USA 4476 (32.2%) with a global citation score (GCS) of 24510 (48.2%) followed by Japan 1846 (13.3%) with GCS of 9145 (18.0%), Peoples R China 1072 (7.7%) with GCS of 2677 (5.3%), UK 931 (6.7%) with GCS of 7321 (14.4%) Australia 845 (6.1%) with GCS of 3115 (6.1%) and the rest below 6%. India is in 17th position among the top 20 most productive countries with its global citation score of 394 (0.8%) during 2005 to 2015.

TABLE 2 RANKING OF CONTRIBUTORS OF ARTICLES

| S.No.	Rank	Contributor	Records	TLCS	TGCS
1	1	Hirsch FR	124	216	2502
2	2	Park, K	118	53	483
3	3	Shepherd FA	114	147	1586
4	4	Rosell R	112	114	1703
5	5	Novello S	107	25	255
6	6	Govindan R	99	72	895
7	7	Yamamoto N	98	28	608
8	8	Nakagawa K	97	46	767
9	9	Tsao MS	94	43	629
10	10	Asamura H	93	285	2891
11	11	Wu YL	89	29	373
12	12	Ahn MJ	87	47	442
13	12	Socinski MA	87	36	666
14	13	Gandara DR	85	47	681
15	13	Kris MG	85	69	777
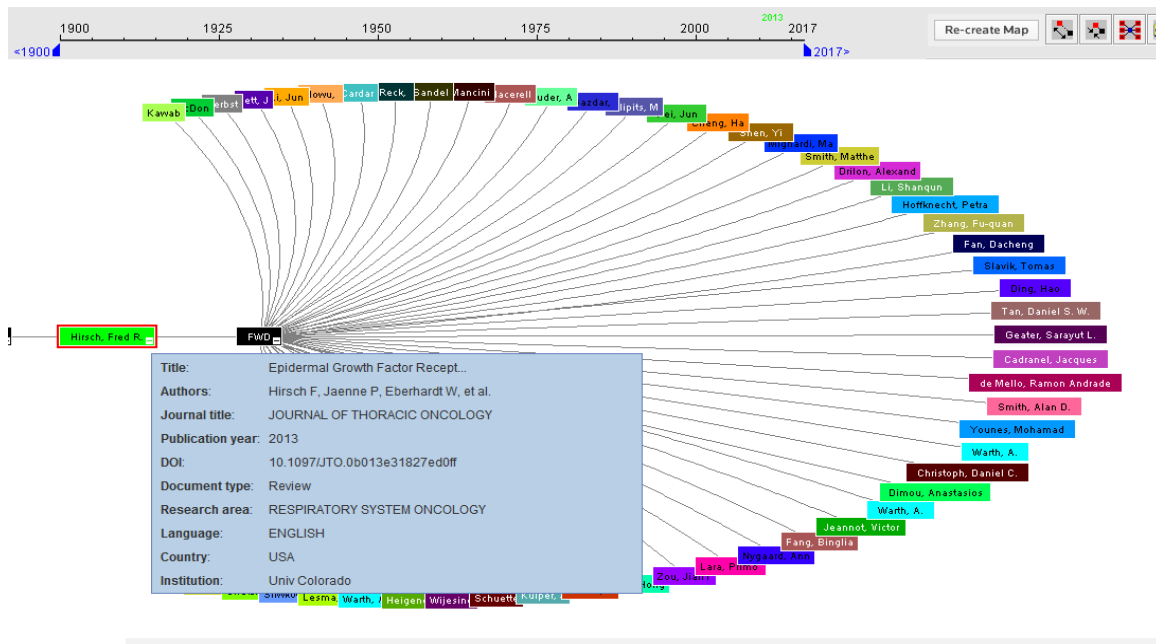
Fig.2a   A paper and other papers using web of science mapping tool and techniques
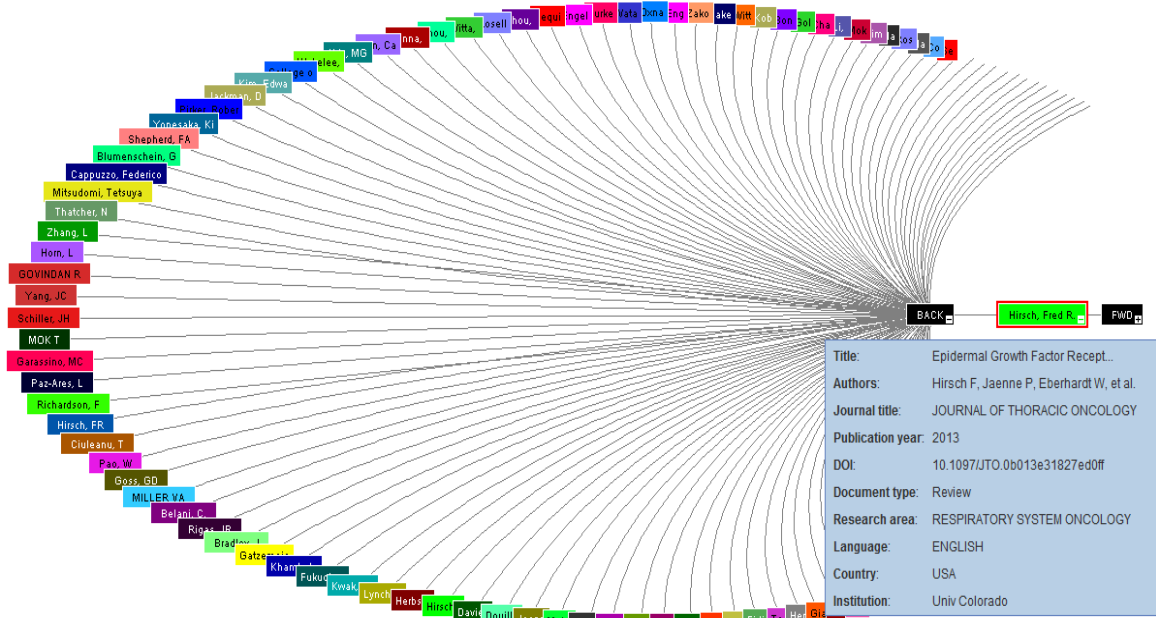
Fig.2b Citation Map of Most Productive Author with Forward and Backward Views

TABLE 3 PUBLICATION OUTPUT OF TOP 20 COUNTRIES

S.No	Country	Records	%	TLCS	TGCS
1	USA	4476	32.2	2044	24510
2	Japan	1846	13.3	817	9145
3	Peoples R China	1072	7.7	158	2677
4	UK	931	6.7	702	7321
5	Australia	845	6.1	227	3115
6	Canada	834	6	577	6580
7	Italy	810	5.8	267	3526
8	South Korea	770	5.5	238	2645
9	France	616	4.4	307	3409
10	Spain	580	4.2	153	2444
11	Germany	564	4.1	179	2978
12	Netherlands	557	4	376	4075
13	Unknown	506	3.6	76	552
14	Belgium	346	2.5	264	2714
15	Taiwan	247	1.8	86	1189
16	Poland	217	1.6	51	832
17	India	215	1.5	36	394
18	Switzerland	203	1.5	69	942
19	Turkey	197	1.4	25	255
20	Denmark	172	1.2	38	807

CiteSpace, v. 4.2.R1 (32-bit)
September 15, 2016 11:39:26 AM IST
C:\Users\admin\Desktop\JTP Citespace\Data
Timespan: 2006-2015 (Slice Length=3)
Selection Criteria: Top 50 per slice
Network:. N=71, E=247 (Density=0.0994)
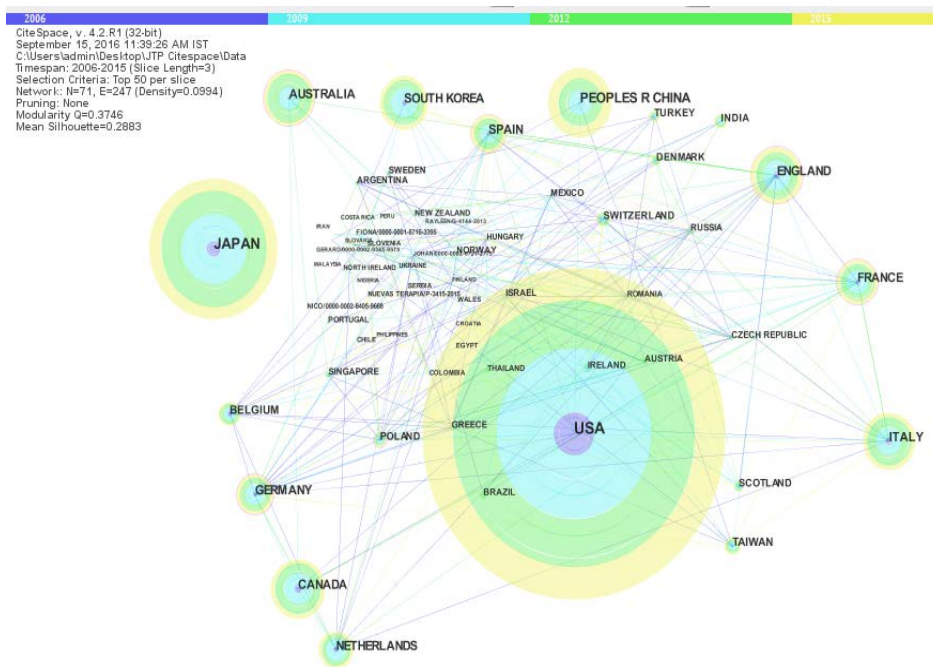Pruning: None
Modularity Q=0.3746
Mean Silhouette=0.2883

Fig.3 Mapping and Cluster on Publication Output of Top 20 Countries

TABLE 4 RESEARCH OUTPUT AND CITATION RESULT OF TOP TWENTY INSTITUTIONS

S. No.	Institution	TP	%	TLCS	TGCS	ACPP
1	Memorial Sloan Kettering Cancer Center	373	2.7	695	7193	19.28
2	Uni. of Texas MD Anderson Cancer Center	315	2.3	165	1880	5.97
3	University of Colorado Boulder	277	2	222	2153	7.77
4	National Cancer Centre	217	1.6	335	2986	13.76
5	Mayo Clinic	197	1.4	118	2164	10.98
6	University of Toronto	185	1.3	144	1836	9.92
7	University of Turin	183	1.3	113	974	5.32
8	Peter MacCallum Cancer Centre	176	1.3	77	1195	6.79
9	Dana Farber Cancer Institute	172	1.2	110	1264	7.35
10	Massachusetts Gen Hospital	161	1.2	94	1374	8.53
11	University of Chicago	161	1.2	73	1027	6.38
12	Sungkyunkwan University	158	1.1	93	844	5.34
13	Princess Margaret Hospital	150	1.1	110	1170	7.80
14	Duke University	141	1	128	1244	8.82
15	Washington University	139	1	94	1124	8.09
16	NCI	138	1	63	641	4.64
17	Institute Gustave Roussy	131	0.9	38	530	4.05
18	Harvard University	130	0.9	81	1251	9.62
19	Seoul National University	127	0.9	99	969	7.63
20	University of Pennsylvania	124	0.9	14	198	1.60
		3655	26.3	2866	32017	159.66

TP =Total Papers, TGCS = Total Global Citation Score, ACPP = Average Citations per Paper

The top twenty productive institutions involved in oncology research have published 124 and more articles each during 2006 – 2015. The publications outline of these twenty institutions with their research articles, Local Citation Score, Global Citation Score and Average Citations per Paper are presented in Table 4 and Graph 4. These twenty research institutions involved in oncology research together have contributed 3655 (26.3%) articles, with an average of 182 articles per institution. Only seven research institutions have shown higher publications (more than 182) share than the total average. The average citation per paper recorded by the total research articles of these twenty institutions is 7.98 during the selected ten years between 2006 and 2015 and only eight institutions have enrolled higher effect than the above average. Amongst these eight research institutions, the highest impact of 19.28 citations per paper was scored by the Memorial Sloan Kettering Cancer Center followed by National Cancer Centre (13.76 citations per article), Mayo Clinic (10.98 citations per article), University of Toronto (9.92 citations per article), Harvard University (9.62 citations per article), Duke University(8.82 citations per article), Massachusetts Gen Hospital (8.53 citations per article) and Washington University (8.09 Citations Per article).
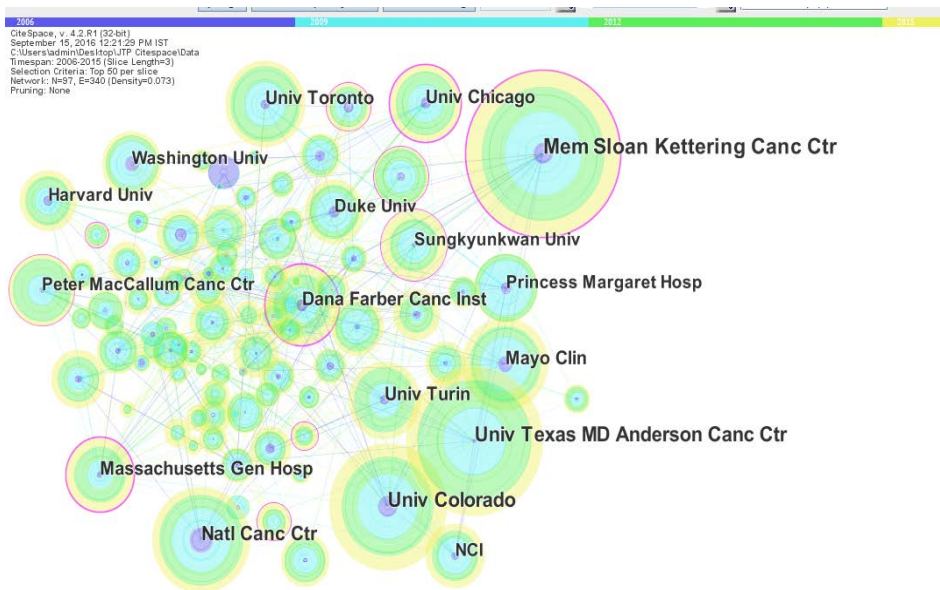

Fig.4 Mapping and Cluster on Publication Output of Top 20 Institutions

Citespace: Parameter settings: Time span: 2005-2015 (Slice length =2), Node type: Keyword: Selection criteria (c, cc, ccv):3, 3, 20.
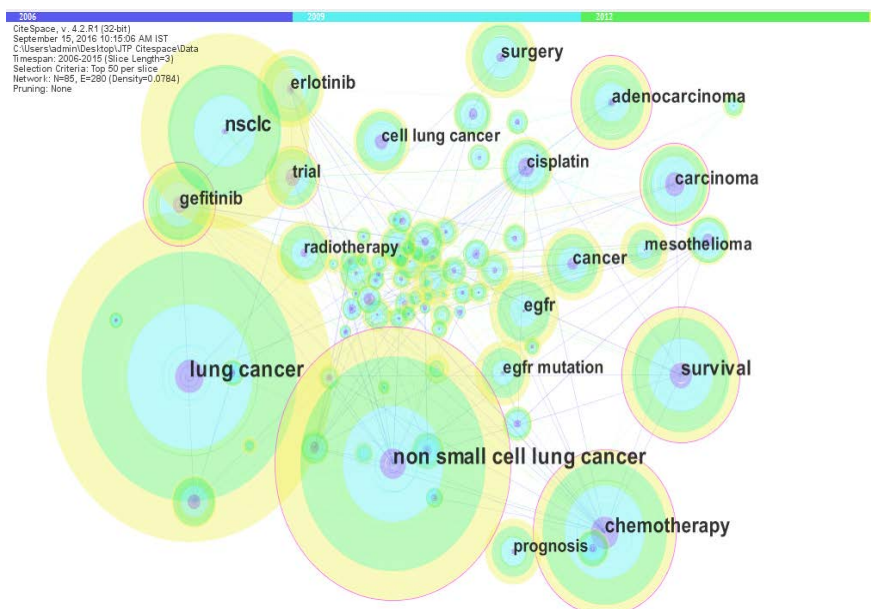

Fig.5 Mapping and Cluster on Co-Occurring Keywords (Some Cluster Places Have Been Well-Adjusted slightly to avoid covering names for next clusters)

TABLE 5 THE STATISTICS OF CO-OCCURRING KEYWORDS (RECORDS ≥ 125)

S.No.	Word	Recs	Percent	TLCS	TGCS
1	Lung	8885	64	3080	40287
2	Cancer	7580	54.6	2640	35564
3	Cell	5260	37.9	1735	24011
4	Small	4893	35.2	1730	23372
5	Non	4402	31.7	1537	20986
6	Patients	3652	26.3	882	12773
7	NSCLC	2251	16.2	168	2036
8	Advanced	1688	12.2	463	6711
9	Stage	1256	9	578	6484
10	Phase	1249	9	345	6191
11	Treatment	1165	8.4	289	4120
12	Chemotherapy	1070	7.7	254	3734
13	EGFR	975	7	293	3400
14	Analysis	925	6.7	316	4215
15	Therapy	899	6.5	202	3039
16	Clinical	895	6.4	235	2788
17	Survival	851	6.1	331	4102
18	Trial	776	5.6	202	3313
19	Radiotherapy	753	5.4	168	2163
20	Adenocarcinoma	717	5.2	355	4304

Table 5 had clearly showed the highly cited keyword.We have selected only most cited keywords for analysis (Threshold ≥ 125 citations). The result that the most productive key word Lung cancer has been used in 8885 (64%) ecords by the researchers with a global citation score of 40287 and local citation score of 3080, followed by the word ell in 5260 records with a global citation score of 24011 and local citation score of 1735. The keywords with ≥ 125 citation had been marked in visualization map as shown in Fig.5.

IV.CONCLUSION

The present study directs a scientometric analysis of journal of thoracic oncology (JTO) research publications for selected ten years between 2006 and 2015.The findings of the study are summarized as follows.

1. The major source of records published in the form of meeting abstracts 10693 (77%) followed by articles.
2. It was observed that there are a total of 34534 of authors for 13888 publications, Hirsch FR identified most productive author (contributed 124 articles).
3. The major contribution to research comes from USA 4476 (32.2%) with global citation score (GCS) of 24510 (48.2%).
4. Only seven research institutions have showed higher publications (more than 182) share than the total average.

5. The most productive key word Lung cancer has been used in 8885 (64%) records by the researchers with a global citation score of 40287 and local citation score of 3080

Based on this study, it can be concluded that, the highest impact of 19.28 citations per paper was scored by the Memorial Sloan Kettering Cancer Center.

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