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SHILPA B S

Kuvempu University, shilpabsmc@gmail.com

Padmamma S

Kuvempu University, spadmamma2010@gmail.com

Arun Kumara T S

Kuvempu University, tsarunkumarmsc@gmail.com

Walmiki Ramesh H

Kuvempu University, walmiki_rh@rediffmail.com

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MAPPING OF SCIENTIFIC ARTICLES ON LEUKEMIA: A SCIENTOMETRIC STUDY

Shilpa B. S¹., Dr. Padmamma S², Arun Kumara T. S³ and Dr. R.H. Walmiki⁴

¹Research Scholar, Department of Library and Information Science, Kuvempu University, Shankaraghatta, Shimoga, Karnataka, India Email: shilpabsmc@gmail.com

²Professor, Department of Library and Information Science, Kuvempu University, Shankaraghatta, Shimoga, Karnataka, India Email: spadmamma2010@gmail.com

³Research Scholar, Department of Library and Information Science, Kuvempu University, Shankaraghatta, Shimoga, Karnataka, India Email: tsarunkumarmc@gmail.com

⁴Dr. R.H.Walmiki Librarian (I.C), University Library, Kuvempu University, Shimoga, Karnataka, India Email: walmiki_rh@rediffmail.com

Abstract

The study analyses the Leukemia research publications in India during 2009 to 2018 based on the Web of Science database. The objectives of the study were to perform a scientometric analysis of all Leukemia research publications by Indian scientist. The parameters studied include growth of publications, document-wise distribution of records, country-wise distribution of publications, identification of most prolific authors, highly preferred journals and highly productive institutions. The result showed that 16794 of records were published in 2016 and 575 of records were published in India. Most of the articles were published in the form of articles, meeting abstracts, review and letter. USA was the most productive country on Leukemia. The study also found that only 4 authors were contributed above 100 numbers of articles and the author Bakhshi a with 121 publication has occupied the first position. The All India Institute of Medical Sciences was top most contributed institution on Leukemia research with 349 records.

Keywords: Scientometrics, Leukemia, Cancer, Web of Science, WoS, India

Introduction

Scientometric is a branch of the science, 'Science of Science'. Scientometric is a scientific discipline, which performs reproducible measurements of scientific activity. Now days, scientometric is one of the truly interdisciplinary research field extended to almost all scientific fields (Simran Gupta, 2018). In this mapping study, the authors have discussed, analyzed and calculated different scientometric aspects by using scientometric tools such as the degree of collaboration, collaborative index and average author per paper. Over the past years there is large number of research articles were published based on scientometric studies. The scientometric study will facilitate to library acquisition. There are number of publications are published in the form of books, research articles in journals, book chapters, reviews, conference papers etc. Based on scientometric studies the librarian will buy the best book at the least price. In recent years due to environmental causes the people around the world are facing several health problems. Among them, the cancer is the most dangerous and deadly disease and Leukemia is one type of cancer. According to World Health Organization Cancer is the second leading cause of death globally, and is responsible for an estimated 9.6 million deaths in 2018. Globally, about 1 in 6 deaths is

due to cancer (World Health Organization, 2019). In the past years a large number of scientometric studies are done on different types of cancers. Like; scientometric study on Colorectal cancer, breast cancer, uterus cancer, lung cancer etc. Hence we conducted the scientometric study on Leukemia research to analyze the various aspects like; year-wise publication, document-wise distribution of records, country-wise publications, most productive authors, highly preferred journals, most contributed institution on Leukemia research during the period 2009 to 2018.

About Cancer

The cancer is deadly disease which is caused due to uncontrolled growth of the cells and forms from the extra mass tissue known as tumour. The loss of apoptotic nature by the cells in their metabolic pathway leads to cancer. Cigarette smoking, tobacco intake, alcohol intake, poor diet and exposure to UV rays lead to cancer. Different organs can be effect by cancer cells like lungs, kidney, eyes, heart, brain etc. Cancer cells also spread in blood stream and causes blood cancer. The person who works in the chemical factories, nuclear reactors, drainage system and mining are most prone to cancer. The most cancer causing agents are aluminium, arsenic, radon, lead and lead compounds, titanium dioxide, Ethidium Bromide, Cobalt with tungsten carbide, Welding fumes and Indium phosphide. Treatments such as surgery, chemotherapy and radiation therapy, bone marrow transplantation are used to treat cancer in different stages (Vanitha Pudata, 2011). Many cancers form solid tumors, which are masses of tissue. Cancers of the blood, such as leukemias, generally do not form solid tumors. Cancerous tumors are malignant, which means they can spread into, or invade, nearby tissues. In addition, as these tumors grow, some cancer cells can break off and travel to distant places in the body through the blood or the lymph system and form new tumors far from the original tumor. Unlike malignant tumors, benign tumors do not spread into, or invade, nearby tissues. Benign tumors can sometimes be quite large, however. When removed, they usually don't grow back, whereas malignant tumors sometimes do. Unlike most benign tumors elsewhere in the body, benign brain tumors can be life threatening (National Cancer Institute, 2019).

Cancer Stages

There are different types of staging systems for different cancers, but the most common is the numbered cancer stage system, which identifies 5 possible stages:

Stage 0: Cancer cells that are still in the location where they started and have not spread

Stage 1: Localized cancer that has spread into nearby tissues. It has not yet spread to lymph nodes or other areas.

Stage 2: Cancer has spread to a regional area or into nearby tissues or lymph nodes.

Stage 3: More advanced regional spread than Stage 2.

Stage 4: Cancer has spread to distant parts of the body. This stage is often referred to as metastatic cancer, or a cancer that has spread to other areas of the body (Start Centre for Cancer Care, 2019).

Types of Cancers

The most commonly diagnosed types of cancer include:

- Bladder cancer
- Breast cancer
- Colon and rectal cancer
- Endometrial cancer
- Kidney cancer
- Leukemia

- Liver cancer
- Lung cancer
- Melanoma
- Non-Hodgkin lymphoma
- Non-melanoma skin cancer
- Pancreatic cancer
- Prostate cancer
- Thyroid cancer (Health, 2019)

What is Leukemia?

Leukemia is one of the cancers related to blood or bone marrow. The Bone marrow produces blood cells. Leukemia can happen when there is a problem with the production of blood cells. It usually affects the leukocytes, or white blood cells. It is most likely to affect people over the age of 55 years, but it is also the most common cancer in those aged less than 15 years. Acute leukemia develops quickly and worsens rapidly, but chronic leukemia gets worse over time (Medical News Today, 2019).

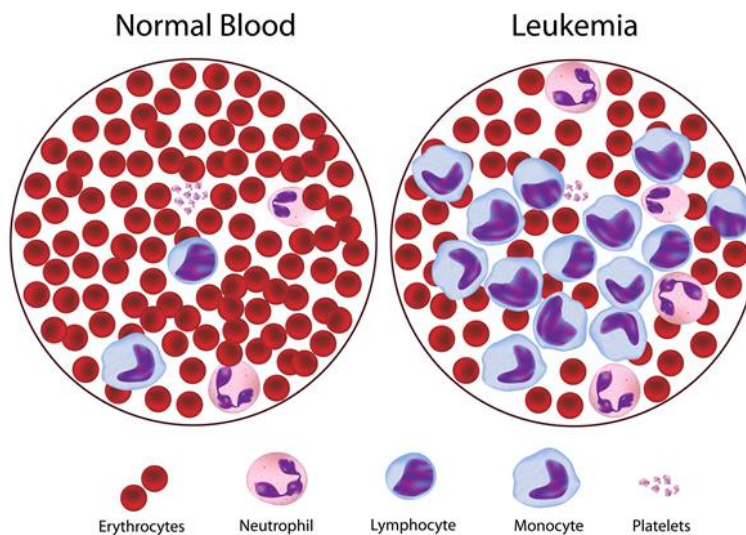


Figure 1: Image of Leukemia Disease

Erythrocyte

Erythrocyte is a type of blood cell that is made in the bone marrow and found in the blood. Erythrocytes contain a protein called haemoglobin, which carries oxygen from the lungs to all parts of the body. (National Cancer Institute, 2019).

Neutrophils

Neutrophils are a type of white blood cell. In fact, most of the white blood cells that lead the immune system's response are neutrophils. There are four other types of white blood cells. Neutrophils are the most plentiful type, making up 55 to 70 percent of your white blood cells. (Health Line, 2019).

Lymphocytes

Lymphocyte is a type of white blood cell that is of fundamental importance in the immune system because lymphocytes are the cells that determine the specificity of the immune response to infectious microorganisms and other foreign substances (Encyclopaedia Britannica, 2019).

Monocytes

Monocytes are a type of white blood cell. Like other white blood cells, monocytes are important in the immune system's ability to destroy invaders, but also in facilitating healing and repair. Monocytes are formed in the bone marrow and are released into peripheral blood, where they circulate for several days. (Verywell Health, 2019).

Platelets

Platelets are tiny blood cells that help your body form clots to stop bleeding. If one of your blood vessels gets damaged, it sends out signals that are picked up by platelets. The platelets then rush to the site of damage and form a plug, or clot, to repair the damage (University of Rochester Medical Center, 2019).

Causes of Leukemia

Although the exact cause of leukemia has still not been identified, some factors which put people at a higher risk of leukemia are:

- Maternal fetal transmission
- Hair dyes
- Smoking
- Artificial ionizing radiation
- Viruses - HTLV-1 (human T-lymphotropic virus) and HIV (human immunodeficiency virus)
- Benzene and some petrochemicals
- Alkylating chemotherapy agents used in previous cancers (Practo, 2019).

Symptoms of Leukemia

Leukemia symptoms vary, depending on the type of leukemia. Common leukemia signs and symptoms include:

- Fever or chills
- Persistent fatigue, weakness
- Frequent or severe infections
- Losing weight without trying
- Swollen lymph nodes, enlarged liver or spleen
- Easy bleeding or bruising
- Recurrent nosebleeds
- Tiny red spots in your skin
- Excessive sweating, especially at night
- Bone pain or tenderness (Mayo Clinic, 2019)

The types of leukemia

The onset of leukemia can be acute (sudden onset) or chronic (slow onset). In acute leukemia, cancer cells multiply quickly. In chronic leukemia, the disease progresses slowly and early symptoms may be very mild.

Leukemia is also classified according to the type of cell. Leukemia involving myeloid cells is called myelogenous leukemia. Myeloid cells are immature blood cells that'd normally become granulocytes or monocytes. Leukemia involving lymphocytes is called lymphocytic leukemia. There are four main types of leukemia:

- Acute lymphocytic leukemia (ALL)
- Acute myeloid leukemia (AML)
- Chronic lymphocytic leukemia (CLL)
- Chronic myeloid leukemia (CML)
- Hairy cell leukemia (HCL) (Cancer Treatment Centers of America, 2019)

Risk Factors for Leukemia

Different types of leukemia have different risk factors. One risk factor may not increase the risk for all types of leukemia. Not all risk factors for the different types of leukemia are listed below.

- Radiation
- Radiation therapy and chemotherapy
- Smoking
- Benzene
- Formaldehyde
- Family cancer syndromes (Canadian Cancer Institute, 2019).

Treatment for Leukemia

There are a number of different medical approaches to the treatment of leukemia. Treatment will typically depend upon the type of leukemia, the patient's age and health status, as well as whether or not the leukemia cells have spread to the cerebrospinal fluid. The genetic changes or specific characteristics of the leukemia cells as determined in the laboratory can also determine the type of treatment that may be most appropriate.

- Chemotherapy
- Biological therapy
- Targeted therapy
- Radiation therapy
- Stem cell transplantation
- Interferon therapy
- Surgery (Medicine Net, 2019).

Literature Review

Padmamma and Walmiki (2016) conducted a scientometric study of articles contributions on Uterus cancer. The authors revealed that a total 3197 records spanning over the year 2006 to 2016. This study showed that overall majority of the researchers used journal articles and majority of the articles were published in English language only. The large numbers of records are published by USA, followed by Canada and the highest number 902 records covered in the field of oncology. Among the 10 years the year 2014 is published highest number of records and was most productive with 434. Santha Kumar and Kaliyaperumal (2015) study analysed the scientometric study on mobile technology. His study showed that majority of the publications produced by multiple authors and the most prolific author is Kim. USA has contributed maximum number of publications compared to other countries and India stood 16th ranking in

terms of productivity. Lakshmi and Raja (2015) used Web of Science database to study the Leukemia research literature in India. Their study showed that the relative growth rate and doubling time were decreasing trend except 2014. This study revealed that linear regression has - 581088.48 value. The most productive journal is pediatric blood & cancer and least productive journal in top 20 was Annals of Hematology. The high frequency keyword in this study was Leukemia and this also depicts that the most productive author is pediatric Bakhshi Sameer with 64 papers. Jeyshankar and Ramesh Babu (2013) studied the scientometric analysis of Leukemia research output during the year 1960 to 2011. From this study it is found that 2120 research papers were published during the period. The study showed that the increasing trend in the entire block year periods with an exception to 1982 to 1986 which showed the declining trend. Relative growth rate and doubling time both were in fluctuation trend. Majority of the researcher preferred journal form to publish their articles. This revealed that future trend on leukemia will have increasing trend in the year 2015 and may gain an increasing trend in 2020. Single authored publications recorded smaller number when compared to the other categories of authorship. This paper also showed that top ranked journal's list, in this the Journal of leukemia were placed in the first position. Gupta and Adarsh Bala (2013) used Scopus international database to study the Bone Marrow research in India. Their study showed that the Indian publications output in bone marrow research consisted of 2613 papers during 2003 to 2012, which increased from 174 papers in 2003 to 397 papers in 2012, witnessing an annual average growth rate of 10.04%. The average citation impact per paper registered by Indian publications in bone marrow research was 2.84 during 2003 to 2012, which decreased from 3.53 during 2003 to 2007 to 2.47 during 2008 to 2012. Mehrdad Moghimi et al. (2013) conducted a scientometric analysis of 20 years of research on Breast reconstruction surgery.

Objectives of the study

1. To ascertain the Leukemia research output in world and India during 2009 to 2018.
2. To study the document-wise publications productivity.
3. To analyse the country-wise publications.
4. To identify the most prolific authors in the field of Leukemia.
5. To determine the core journals which published the articles related to Leukemia.
6. To find out the most common key word used while publication.
7. To study the institution-wise distribution of publications.

Methodology

The required data for this study is retrieved and downloaded from Web of Science core collection database maintained by Thomson Reuters. The period of study is 10 years (2009 to 2018). To collect the necessary data using basic search strategy i.e. key word "Leukemia" as a topic; time span from 2009 to 2018. A record of 1,44,600 covering various document types was shown then refined the records using country/territory. The selected country as 'India' resulting in search result of 3980 records, related to Leukemia. All the bibliographic details were retrieved in text file format for further analysis. MS Excel, Histcite software package were used to analyses the collected data.

Data analysis and interpretation

Table 1: Global and Indian Output in oncology Research, 2009-2018

Year	Global Output	%	Cum Global Output	Cum %	Indian Output	%	Cum Indian Output	Cum %	India's share in %
2009	11818	8.17	11818	8.17	229	5.75	229	5.75	1.94
2010	12798	8.85	24616	17.02	269	6.76	498	12.51	2.10
2011	12826	8.87	37442	25.89	295	7.41	793	19.92	2.30
2012	13541	9.36	50983	35.26	309	7.76	1102	27.69	2.28
2013	14431	9.98	65414	45.24	357	8.97	1459	36.66	2.47
2014	14995	10.37	80409	55.61	452	11.36	1911	48.02	3.01
2015	16627	11.50	97036	67.11	530	13.32	2441	61.33	3.19
2016	16794	11.61	113830	78.72	575	14.45	3016	75.78	3.42
2017	16733	11.57	130563	90.29	477	11.98	3493	87.76	2.85
2018	14037	9.71	144600	100.00	487	12.24	3980	100.00	3.47
Total	144600	100			3980	100			2.75

India's Leukemia research output during the period 2009 to 2018 is compared to the world output in the Table 1 the growth was very slow during 2009 to 2018. In World output it is found that maximum number of records 16794 was published during the year 2016 and in India's output the maximum number of records 575 was published also in the same year. India's share through the world output highest in the year 2018 with 3.47%, it is shows that the Indian researcher's interest becoming added for publications on Leukemia.

Table 2: Form-wise distribution of records

Document Type	Records	Percentage	Cumulative records	Percentage
Article	2597	65.25	2597	65.25
Meeting Abstract	557	13.99	3154	79.25
Review	428	10.75	3582	90.00
Letter	254	6.38	3836	96.38
Editorial Material	107	2.69	3943	99.07
Article; Proceedings Paper	21	0.53	3964	99.60
Review; Book Chapter	5	0.13	3969	99.72
Article; Book Chapter	4	0.10	3973	99.82
Article; Retracted Publication	4	0.10	3977	99.92
Correction	2	0.05	3979	99.97
Article; Early Access	1	0.03	3980	100.00
Total	3980	100.00		

Table No. 2 shows the document-wise distribution of publications. It shows that most of scholarly communications of research output in the form of articles a total 2597 (65.25%), followed by meeting abstract 557 (13.99), review 428 (10.75), letter 254 (6.38), editorial materials 107 (2.69%), proceeding paper 21 (0.53%), review: book chapter 5 (0.13%), article: book chapter and article retracted publications are 4 (0.10%) each, correction 2 (0.05%), and article; early access 1 (0.03%) out of total publications in 10 years period of this study.

Table 3: Most productive countries and their publications (Top 25)

Sl. No.	Country	Records	Percentage
1	USA	50669	35.04
2	Peoples R china	16231	11.23
3	Germany	13945	9.64
4	Italy	11295	7.81
5	England	9368	6.48
6	Japan	9353	6.47
7	France	8626	5.97
8	Canada	5964	4.12
9	Spain	5300	3.67
10	Netherlands	4478	3.1
11	Australia	4126	2.85
12	India	3979	2.75
13	South korea	3835	2.65
14	Sweden	2939	2.03
15	Switzerland	2840	1.96
16	Brazil	2669	1.85
17	Poland	2542	1.76
18	Turkey	2382	1.65
19	Austria	2218	1.53
20	Belgium	2215	1.53
21	Israel	2042	1.41
22	Taiwan	1949	1.35
23	Czech Republic	1887	1.31
24	Iran	1729	1.2
25	Denmark	1636	1.13

It is seen from the Table No. 3 that the country with the greatest output in term of research on Leukemia is USA with 50669 (35.04%) records, followed by China and Germany with a total of 16231 (11.23%) and 13945 (9.64) publications respectively. Subsequent positions are occupying by Italy 11295 (7.81%), England 9368 (6.48%), Japan 9353 (6.47%) and France 8626 (5.97%) the remaining countries publications are less than 5% of total research output in this study period. India is on 12th position with a total number of 3979 (2.75%) publications.

Table 4: Most productive authors (Top 25)

Sl.No.	Author	Records	TLCS	TGCS	H Index
1	Bakhshi S	121	78	430	12
2	Kumar A	120	85	718	14
3	Sharma A	112	70	569	14
4	Varma N	102	49	339	10
5	Malhotra P	98	54	151	6
6	Bansal D	89	85	318	9
7	Kumar R	88	37	297	9
8	Kumar S	83	74	687	14
9	Trehan A	80	75	280	9
10	Marwaha RK	75	118	375	10
11	Gupta R	73	27	219	7
12	Kumar L	73	66	384	9
13	Mathews V	72	66	537	13

14	Varma S	71	28	125	6
15	George B	68	63	925	14
16	Gujral S	66	33	106	5
17	Saxena R	64	30	124	6
18	Srivastava A	59	69	461	12
19	Singh A	58	10	268	7
20	Raina V	53	32	141	6
21	Mahapatra M	52	9	69	5
22	Balasubramanian P	51	60	399	10
23	Sharma P	51	17	441	6
24	Subramanian PG	50	34	130	6
25	Sharma S	49	58	398	7

TLCS= Total Local Citation Score, TGCS= Total Global Citation Score

Table No.4 enumerates the top 20 prolific authors in research on Leukemia based on their highest publications over the period of 10 years. It is also analysis the total local citation scores, total global citation score and h-index value. Only 4 authors have contributed above 100 number of articles. Bakhshi S with 121 publications has occupied the 1st place, followed by Kumar A with 120 publications, Sharma A with 112 publications, Varma N with 102 publications and Sharma S have occupy the 25th place with 49 publications among top 25 authors. But according to the h-index list of top 25 authors, Kumar A, Sharma A, Kumar S and George B placed in first position with 14 h-index value each and Mahapatra M placed in the last position with 5 h-index value.

Table 5: Top 25 most productive journals

Sl. No.	Journal	Records	Percentage	TLCS
1	Pediatric blood & cancer	274	6.88	54
2	Indian journal of hematology and blood transfusion	193	4.85	59
3	Indian journal of pathology and microbiology	90	2.26	36
4	Blood	82	2.06	17
5	Leukemia & lymphoma	77	1.93	75
6	Indian journal of cancer	71	1.78	22
7	Indian journal of pediatrics	59	1.48	29
8	Plos one	56	1.41	0
9	European journal of medicinal chemistry	51	1.28	57
10	Journal of pediatric hematology oncology	51	1.28	71
11	Journal of cancer research and therapeutics	50	1.26	11
12	Journal of clinical and diagnostic research	49	1.23	1
13	Indian pediatrics	46	1.16	32
14	Journal of clinical oncology	46	1.16	25
15	Indian journal of medical and paediatric oncology	45	1.13	10
16	Asian pacific journal of cancer prevention	41	1.03	36
17	Haematologica	41	1.03	2
18	Annals of oncology	32	0.80	0
19	Pediatric hematology and oncology	31	0.78	23
20	RSC advances	30	0.75	14
21	Medicinal chemistry research	28	0.70	4
22	International journal of laboratory hematology	27	0.68	0

23	Indian journal of medical research	26	0.65	23
24	Journal of evolution of medical and dental sciences-JEMDS	26	0.65	0
25	Bioorganic & medicinal chemistry letters	25	0.63	25
Total		1547	38.87	

TGCS= Total Global Citation Score

Table No. 5 Depicts that the list of most preferred journals to publish their research papers. It is identified that the Pediatric blood & cancer is the most preferred journal with 274 (6.88%) records of the total periodical literature output available during the period. Second is Indian journal of hematology and blood transfusion with 193 (4.85%), followed by Indian journal of pathology and microbiology with 90 (2.26%) and the journal Blood is in fourth most preferred with 82 (2.06%). Remaining Institutions are having less than 2% of total periodical literature.

Table 6: Key word-wise distribution of publications (Top 25)

Sl. No.	Word	Records	TLCS	TGCS
1	Leukemia	1638	801	7099
2	Acute	1091	518	3354
3	Myeloid	680	330	3836
4	Lymphoblastic	546	265	1477
5	Chronic	492	184	3205
6	Cell	484	201	3496
7	Cancer	431	185	8206
8	Patients	364	130	1700
9	Cells	362	268	4515
10	India	281	224	928
11	Synthesis	227	101	2970
12	Case	209	36	259
13	Activity	203	126	2145
14	Imatinib	196	97	2261
15	Leukaemia	196	110	798
16	Children	182	81	729
17	Novel	182	149	1598
18	Human	177	106	1788
19	Therapy	167	63	1263
20	Evaluation	161	102	1447
21	Experience	160	88	268
22	Analysis	159	69	1454
23	Expression	154	64	888
24	Treatment	154	61	625
25	Childhood	153	188	702

TLCS= Total Local Citation Score, TGCS= Total Global Citation Score

Table No.6 presents the top 25 keywords used by the researchers in their publications. It is clearly seen from the table that the word Leukemia has been used 1638 times by the researchers with a Local Citation Score of 801 and a Global Citation Score of 7099. Followed by Acute with 1091 records (TLCS 518 and TGSC 3354), Myeloid with 680 records (TLCS 330 and TGSC 3836), and Lymphoblastic 546 records (TLCS 265 and TGSC 1477)

Table 7: Top 25 Subject-wise research output

Sl. No.	Subject-wise Categories	Records	Percentage
1	Oncology	1169	29.37
2	Haematology	1050	26.38
3	Paediatrics	491	12.34
4	Biochemistry molecular biology	335	8.42
5	Pharmacology pharmacy	302	7.59
6	Chemistry medicinal	257	6.46
7	Cell biology	188	4.72
8	Medicine general internal	180	4.52
9	Pathology	178	4.47
10	Medicine research experimental	134	3.37
11	Chemistry multidisciplinary	127	3.19
12	Biotechnology applied microbiology	115	2.89
13	Immunology	114	2.86
14	Multidisciplinary sciences	100	2.51
15	Toxicology	86	2.16
16	Genetics heredity	80	2.01
17	Biophysics	72	1.81
18	Chemistry organic	69	1.73
19	Medical laboratory technology	49	1.23
20	Dermatology	45	1.13
21	Biology	37	0.93
22	Chemistry applied	36	0.91
23	Transplantation	36	0.91
24	Reproductive biology	32	0.8
25	Clinical neurology	30	0.75

Table No.7 shows the India's subject-wise publication output in Leukemia under various subject areas. The highest publications output comes from field of Oncology with 1169 papers 29.37% share, followed by Hematology (with 1050 and 26.38% share), Pediatrics (with 491 and 12.34% share), Biochemistry molecular biology (with 335 and 8.42% share), Pharmacology pharmacy (with 302 and 7.59% share) respectively. Remaining subjects have below 300 publications.

Table 8: Institution-wise contribution (Top 25)

Sl. No.	Institution	Records	Percentage	TLCS	TGCS
1	All India Inst Med Sci	349	8.77	159	2028
2	Postgrad Inst Med Educ & Res	195	4.90	102	906
3	Tata Mem Hosp	178	4.47	65	1636
4	Christian Med Coll & Hosp	118	2.96	75	1132
5	CSIR	89	2.24	95	1234
6	Nizams Inst Med Sci	69	1.73	33	419
7	PGIMER	69	1.73	85	207
8	RegCancCtr	69	1.73	10	212
9	Indian Inst Sci	65	1.63	108	1160
10	Sir Ganga Ram Hosp	56	1.41	32	98
11	Univ Delhi	56	1.41	25	823
12	Indian Inst Integrat Med	55	1.38	38	860

13	Indian Inst Technol	53	1.33	34	783
14	Kidwai Mem Inst Oncol	48	1.21	16	460
15	Manipal Univ	47	1.18	34	519
16	CancInst WIA	46	1.16	21	123
17	Banaras Hindu Univ	45	1.13	18	680
18	Univ Texas MD Anderson CancCtr	44	1.11	40	3527
19	Indian Inst Chem Biol	42	1.06	83	572
20	Rajiv Gandhi CancInst& Res Ctr	38	0.95	15	90
21	Osmania Univ	37	0.93	18	295
22	Tata Med Ctr	37	0.93	7	139
23	King Georges Med Univ	36	0.90	12	79
24	Post Grad Inst Med Educ & Res	36	0.90	19	785
25	Panjab Univ	35	0.88	22	483

TLCS= Total Local Citation Score, TGCS= Total Global Citation Score

Table No.8 shows the institutions-wise distribution of publications; for which only top twenty-five institutions that contributors on leukemia have been shown. All India Inst Med Sci is the top most contributor on Leukemia with 349 (8.77%) records, 159 TLCS and TLGS of 2028, then followed by Postgrad Inst Med Educ & Res with 195 (4.90%) records, 102 TLCS and TLGS 2028, then next comes the Tata Mem Hosp with 178 (4.47%) records, TLCS 65 and TGCS 1636, these are the top three institutions as per the records.

Findings and Conclusion

This study deals with the scientometric analysis of Indian Leukemia research as reported in Web of Science. Except 2017 and 2018 from 2009 to 2016 there is an increasing trend in both world and India. The findings of the study reveal that most of the researchers were interested to publish their publication in the form of articles. In this study USA attains 1st position in world research output, India ranking 12th among the top 25 countries. A Bakhshi S has contributed maximum number of articles but Kumar A, Sharma A, Kumar S and George B placed in first position with 14 h-index value each. Pediatric blood & cancer is becoming core journal by producing the maximum number of articles related to leukemia. It is observed that the word Leukemia is most common key word used by the researchers for searching of information. It is also identified that the oncology and Hematology subjects have large number of articles. In top 25 institutions list All India Institute of Medical science placed in first position by producing highest number of articles.

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