Open Access Blood Research & Transfusion Journal
ISSN: 2575-8934

Juniper Publishers
key to the Researchers

Research Article
Volume 2 Issue 4 - August 2018
DOI: 10.19080/OABTJ.2018.02.555594

Open Acc Blood Res Trans J

Global Thalassemia Research: A Scientometric Assessment of Publications Output during 2008-17

Gupta BM[1] and Ritu Gupta[2]*

[1]*Formerly with National Institute of Science Technology and Development Studies, New Delhi, India*

[2]*Formerly with S.V. University, Tirupathi, India*

Submission: August 03, 2018; **Published:** August 31, 2018

***Corresponding author:** Ritu Gupta, Formerly with S.V. University, Tirupathi, India; Email: ritu7648@gmail.com

Abstract

The present study examined 1030 global publications on thalassemia research during 2008-17, as indexed in Scopus database, with a view to understand their growth rate, global share, citation impact, international collaborative papers share, distribution of publications by broad subjects, productivity and citation profile of top organizations and authors, preferred media of communication and bibliographic characteristics of high cited papers. The annual and cumulative global publication output on thalassemia research decreased from 133 to 98 and 558 to 472, witnessing -1.63% during 2008-17 and -15.41% growth from 2008-12 to 2013-17. The citation impact per paper of global publications in thalassemia research was averaged to 10.18 during 2008-17, however, decreasing from 15.45 CPP during 2008-12 to 3.96 CPP during 2013-17. Among 75 participating countries, the top 10 countries global publication share ranged from 3.50% to 17.86% during 2008-17, with highest publication share (17.86%) coming from U.K., followed by Italy (14.47%), USA (9.61%), India (8.93%), etc. during 2008-17. 81.65% of the cumulative global publication share comes from top 10 countries during 2008-17, showing increase from 80.11% to 83.47% from 2008-12 to 2013-17. Three out of 10 countries have scored relative citation index more than the average of 1.34: USA (2.62), Italy (1.75) and U.K. (1.71) during 2008-17. Medicine, among four broad subjects, contributed the largest publications share of 86.89%, followed by biochemistry, genetics & molecular biology (17.86%), pharmacology, toxicology & pharmaceutics (2.82%) and immunology & microbiology (2.04%) during 2008-17. Beta Thalassemia accounted for the highest global share (57.38% share), followed by Alpha Thalassemia (19.13% share), Haemoglobin E Thalassemia (5.92% share), etc. during 2008-17. Among 396 organizations and 594 authors contributing to global thalassemia research, the 10 most productive global organizations and authors together contributed 27.28% and 15.05% respectively as their share of global publication output and 56.46% and 24.77% respectively as their share of global citation output during 2008-17. Amongst 996 journal papers (in 369 journals) in global thalassemia research, the top 15 most productive journals contributed 34.74% share of total journal publication output during 2008-17. Only eight publications were found to be high cited, as they registered citations from 118 to 694 during 2008-17 and they together received 1949 citations, which averaged to 243.625 citations per paper.

Keywords: Thalassemia research; Global publications; Scientometrics; BIbliometrics

Introduction

Thalassemias (also known as Mediterranean anemia) are described a group of inherited or genetic blood disorders. Thalassemia causes the body to make fewer healthy red blood cells and less hemoglobin than normal. Hemoglobin is an iron-rich protein in red blood cells. In thalassemia cases, where insufficient haemoglobin is present in the blood, oxygen does not reach all the parts of body properly. It causes starvation of oxygen in various organs and thereby increasing their inability to function properly. Thalassemia is inherited that means at least one parent is a carrier of the disease; it's either genetic mutation or deletion of main gene fragments. If only one parent is a carrier, patient develops thalassemia minor, wherein there are no symptoms or may develop minor symptoms like minor anemia. In cases where both parents are carriers of the trait, the patient develops serious form the disease called thalassemia major (almost 25 per cent of the cases) [1-3].

People who have thalassemia can have mild or severe anemia (uh-NEE-me-uh). Anemia is caused by a lower than normal number of red blood cells or not enough hemoglobin in the red blood cells. Anemia can result in feeling tired and pale skin. There may also be bone problems, an enlarged spleen, yellowish skin, dark urine, and among children slow growth [1-3].

Haemoglobin is made up of two types of proteins, Alpha globin and Beta globin. In thalassemia, a defect occurs in a gene that controls production of one of these proteins. The main forms of thalassemia are:

(i) Alpha-thalassemia: It is a major serious disease in which no alpha globins are formed and thereby anemia begins even before the birth of the baby. Pregnant mother carrying the baby is herself at serious risk of pregnancy and delivery complications. This form is generally incompatible

with life;

(ii) Beta-thalassemia: Thalassemia major (Cooley 's anemia) causes severe life-threatening anemia. Other symptoms include paleness, poor appetite, frequent infections, enlargement of organs and jaundice. This is a serious form that requires regular blood transfusions. Thalassemia intermedia is a less severe form in which blood transfusions are not required;

(iii) Delta-thalassemia: Just like beta-thalassemia, in this mutation affect ability of the gene to produce delta chains and

(iv) Combined haemoglobinopathies: Thalassemia can exist in combination with other haemoglobinopathies;

(a) Haemoglobin E/thalassemia is clinically similar to Beta-thalassemia major or thalassemia intermedia. It is common in Thailand, parts of India and Cambodia;

(b) Haemoglobin S/thalassemia is clinically similar to sickle-cell disease with feature of spleen enlargement too. It is common in African and Mediterranean countries;

(c) Haemoglobin C/thalassemia causes moderately severe anemia with spleen enlargement and is common in African and Mediterranean countries and

(d) Haemoglobin D/thalassemia is common in northwest parts of India and Pakistan [1, 4].

Treatment depends on the type and severity. Treatment for those with more severe disease often includes regular blood transfusions, iron chelation, and folic acid. Iron chelation may be done with deferoxamine or deferasirox. Occasionally, a bone marrow transplant may be an option. Complications may include iron overload from the transfusions with resulting heart or liver disease, infections and osteoporosis. If the spleen becomes overly enlarged, surgical removal may be required [1].

As of 2013, thalassemia occurs in about 280 million people, with about 439,000 having severe disease. It is most common among people of Italian, Greek, Middle Eastern, South Asian and African descent. Males and females have similar rates of disease. It resulted in 16,800 deaths in 2015, down from 36,000 deaths in 1990. Those who have minor degrees of thalassemia, similar to those with sickle-cell trait, have some protection against malaria, explaining why they are more common in regions of the world where malaria exists [1].

Literature review

There is no specific bibliometric study on Thalassemia research output so far. However, there are few bibliometric studies focusing on overall blood diseases. Among such studies, Daneshmand, Forouzandeh, Azadi and Cheraghzadeh Dezfuli [5] examined quantitative and qualitative evaluation of hematological research output in five Islamic countries; Iran, Turkey, Malaysia, Saudi Arabia and Egypt; which have the most scientific productions from 1996-2013. Gupta [6] analyzed the heredity blood disorders research output, using Scopus database during 2002-11 on different parameters including the global publications share and citation quality of top 10 leading countries, India's growth, citation impact, share of international collaborative papers, contribution of major collaborative partner countries, contribution of various subject fields and by type of heredity blood disorder, pattern of research communication in most productive journals, productivity and citation profile of top Indian institutions and authors and characteristics of high cited papers.

Objectives

Based on publications covered and indexed in Scopus database, the present study analysed the global Thalassemia research during 2008-17. In particular, the study analyses the growth rate in global publications; global publication output and citation impact of world and top 10 most productive countries; its broad publication distribution by broad subject areas; its leading organizations and authors, in terms of publication output and citation impact; its leading media of communication, particularly the most productive journals and bibliographical characteristics of its 8 highly cited papers.

Methodology

Few quantitative and qualitative bibiometric indicators have been used in this study to measure the performance of global Thalassemia research output. The basic publication data for the present study was retrieved and downloaded from the Scopus database for 10 years during 2008-17. For retrieving publication data from the Scopus database, the authors have used the Keyword such as "THALASSAEMIA " in "Keyword" tag or ''Article Title'' tag and further restricting the search to the period 2008-17 in "date range tag" for searching the global publication data on Thalassemia and this becomes the main search string. When the main search string with restricted to individual top 10 most productive countries name in "country tag", the publication data on the individual country in Thalassemia research were obtained. The search string is further refined, as provided in Scopus database, by restricting to "subject area tag", "country tag", "source title tag", "journal title name" and "affiliation tag", to get information on the distribution of publications by subject, collaborating countries, author-wise, organization-wise and journal-wise, etc. For citation data, citations to publications were also collected from the date of publication till 4 July 2018.

(KEY(THALASSAEMIA) OR TITLE(THALASSAEMIA)) AND PUBYEAR > 2007 AND PUBYEAR < 2018

Analysis

The world has published 1030 publications on thalassemia research in 10 years during 2008-17, which decreased from 133 publications in 2008 to 98 publications in 2017, registering annual average growth rates of -1.63%. The cumulative growth of world publications on thalassemia research decreased from 558

How to cite this article: Ritu Gupta, Gupta BM. Global Thalassemia Research: A Scientometric Assessment of Publications Output during 2008-17. Open Acc Blood Res Trans J. 2018; 2(4): 555594. DOI: 10.19080/OABTJ.2018.02.555594.

during 2008-12 to 472 publications during 2013-17, witnessing a growth rate of -15.41%. The average citation per publication (CPP) registered by global publications on thalassemia research was 10.18 during 2008-17, which decreased from 15.45 CPP during 2008-12 to 3.96 CPP during 2013-17. Of the total global publications, 73.40% (756) have appeared as articles, 10.97% (113) as reviews, 6.99% (72) as letters, 2.43% (25) as book chapters, 1.75% (18) as conference papers, 1.65% (17) as notes, 1.26% (13) as editorials, 0.58% (6) as short surveys, 0.49% (5) as erratum, 0.39% (4) as articles in press and 0.10% (1) as book (Table 1).

Table 1: World Literature on Thalassemia Annual and Cumulative Research Output: Growth and Citation Impact, 2008-17.

Publication Period	World		
	TP	TC	CPP
2008	133	2229	16.76
2009	98	1486	15.16
2010	101	2425	24.01
2011	115	1358	11.81
2012	111	1121	10.1
2013	95	631	6.64
2014	110	542	4.93
2015	76	411	5.41
2016	93	172	1.85
2017	98	114	1.16
2008-12	558	8619	15.45
2013-17	472	1870	3.96
2008-17	1030	10489	10.18
TP=Total Papers; TC=Total Citations; CPP=Citations Per Paper			

Global publication share & citation impact of top 10 most productive countries

The global thalassemia research output originated in 75 countries during 2008-17, of which 43 countries contributed 1-5 papers each, 5 countries 6-10 papers each, 20 countries 11-50 papers each, 5 countries 51-100 papers each and 2 countries 101-83 papers each during 2008-17. Table 2 lists the output of top 10 most productive countries in thalassemia research during 2008-17. The cumulative publication and citation share of 10 most productive countries in thalassemia research was 81.65% and more than 100% of the world publication and citations output during 2008-17. Individually, the global publication share of these 10 countries varied from 3.50% to 17.86% during 2008-17, with highest publication share (17.86%) coming from U.K., followed by Italy (14.47%), USA (9.61%), India (8.93%), Greece (6.60%), Malaysia and Thailand (5.73% and 5.44%), Pakistan, and Australia (4.85% and 4.66%) ,and Iran (3.50%) during 2008-17.The global publication share showed increase in Greece, U.K., Italy, Iran and USA (from 0.08% to 1.09%), as against decrease in Malaysia, India, Thailand, Australia and Pakistan (from 0.02% to 1.48) from 2008-11 to 2012-17. U.K., Italy and USA together accounts for 41.94% and 80.94% share of global publications and citations output, while 7 other countries together have global publication and citation share from 39.71% to 28.64% during 2008-17. Among top 10 countries, USA registered the highest citation impact per paper of 26.66, followed by Italy (17.79), U.K. (17.40), Greece (12.0), Thailand (8.96), Australia (9.63), Iran (8.75), Malaysia (5.73), India (5.50) and Pakistan (3.14) during 2008-17. Three out of 10 countries have scored relative citation index more than the average of 1.34: USA (2.62), Italy (1.75) and U.K. (1.71) during 2008-17.

Table 2: Publication Output, Global Publication Share & International Collaborative Publications of Top 10 Most Productive Countries in Thalassemia Research during 2008-17.

S.No	Country Name	Number of Papers			Share of Papers			TC	CPP	ICP	%ICP	RCI
		2008-12	2013-17	2008-17	2008-12	2013-17	2008-17	2008-17				
1	U.K.	103	81	184	18.46	17.16	17.86	3201	17.4	88	47.83	1.71
2	Italy	84	65	149	15.05	13.77	14.47	2650	17.79	48	32.21	1.75
3	USA	54	45	99	9.68	9.53	9.61	2639	26.66	73	73.74	2.62
4	India	43	49	92	7.71	10.38	8.93	506	5.5	15	16.3	0.54
5	Greece	42	26	68	7.53	5.51	6.6	816	12	21	30.88	1.18

How to cite this article: Ritu Gupta, Gupta BM. Global Thalassemia Research: A Scientometric Assessment of Publications Output during 2008-17. Open Acc Blood Res Trans J. 2018; 2(4): 555594. DOI: 10.19080/OABTJ.2018.02.555594.

6	Malaysia	25	34	59	4.48	7.2	5.73	246	4.17	6	10.17	0.41
7	Thailand	26	30	56	4.66	6.36	5.44	502	8.96	22	39.29	0.88
8	Pakistan	27	23	50	4.84	4.87	4.85	157	3.14	8	16	0.31
9	Australia	23	25	48	4.12	5.3	4.66	462	9.63	22	45.83	0.95
10	Iran	20	16	36	3.58	3.39	3.5	315	8.75	7	19.44	0.86
	Total	447	394	841	80.11	83.47	81.65	11494	13.67	310	36.86	1.34
	World Total	558	472	1030				10489	10.18			

Subject-wise distribution of research output

As per the Scopus database classification, the global thalassemia research output is distributed across four sub-fields during 2008-17. Among 4 sub-fields, medicine registered the highest publications share (86.89%), followed by biochemistry, genetics & molecular biology (17.86%), pharmacology, toxicology & pharmaceutics (2.82%) and immunology & microbiology (2.04%) during 2008-17. The publication activity, as seen through activity index from 2008-12 to 2013-17, witnessed decrease in medicine (from 104.36 to 95.66), as against increase in biochemistry, genetics & molecular biology (from 94.30 to 107.65), pharmacology, toxicology & pharmaceutics (from 63.65 to 144.19) and immunology & microbiology (from 52.74 to 157.20) from 2008-12 to 2013-17. Biochemistry, genetics & molecular biology registered the highest citation per paper of 9.83 among four subjects, followed by medicine (9.75), biochemistry, genetics & molecular biology (9.38), pharmacology, toxicology & pharmaceutics (9.38) and immunology & microbiology (6.43) during 2008-17 (Table 3).

Table 3: Global Research Output by Type of Thalassemia Research during 2008-17.

S.No	Subject*	Number of Papers (TP)			Activity Index		Total Citations	CPP	%TP
		2008-12	2013-17	2008-17	2008-12	2013-17	2008-17		
1	Medicine	506	389	895	104.36	95.66	8730	9.75	86.89
2	Biochemistry, Genetics & Molecular Biology	94	90	184	94.3	107.65	1809	9.83	17.86
3	Pharmacology, Toxicology & Pharmaceutics	10	19	29	63.65	144.19	272	9.38	2.82
4	Immunology & Microbiology	6	15	21	52.74	157.2	135	6.43	2.04
	World Output	558	468	1030			10489		
*CPP=Citation per Paper									

Type of thalassemia research

Of the type of thalassemia global research output, Beta Thalassemia accounted for the highest publication output and global share (591 papers, 57.38% share), followed by Alpha Thalassemia (197 papers, 19.13% share), Haemoglobin E Thalassemia (61 publications, 5.92% share), etc. during 2008-17 as seen in Table 4. The global publication share increased in case of Alpha Thalassemia and Delta Thalassemia, as against decrease in case of Beta Thalassemia, Haemoglobin E Thalassemia, Haemoglobin S Thalassemia, Haemoglobin C Thalassemia and Haemoglobin D Thalassemia from 2008-12 to 2013-17. Haemoglobin D Thalassemia registered the highest citation impact per paper of 25.41, followed by Haemoglobin C Thalassemia (16.69), Haemoglobin E Thalassemia (15.54), Haemoglobin S Thalassemia (13.96), Alpha Thalassemia (12.79), Delta Thalassemia (11.62) and Beta Thalassemia (11.24) during 2008-17.

Table 4: Global Research Output by Type of Thalassemia Research during 2008-17.

S.No.	Type of Thalassemia	Number of Papers			Share of Papers			TC	CPP
		2008-12	2013-17	2008-17	2008-12	2013-17	2008-17	2008-17	
1	Alpha Thalassemia	99	98	197	17.74	20.94	19.13	2520	12.79
2	Beta Thalassemia	337	254	591	60.39	54.27	57.38	6640	11.24
3	Delta Thalassemia	4	9	13	0.72	1.92	1.26	151	11.62
4	Haemoglobin E Thalassemia	37	24	61	6.63	5.13	5.92	948	15.54
5	Haemoglobin S Thalassemia	16	10	26	2.87	2.14	2.52	363	13.96
6	Haemoglobin C Thalassemia	16	13	29	2.87	2.78	2.82	484	16.69
7	Haemoglobin D Thalassemia	14	3	17	2.51	0.64	1.65	432	25.41
		558	468	1030				10489	
TC=Total Citations; CPP=Citations Per Paper									

How to cite this article: Ritu Gupta, Gupta BM. Global Thalassemia Research: A Scientometric Assessment of Publications Output during 2008-17. Open Acc Blood Res Trans J. 2018; 2(4): 555594. DOI: 10.19080/OABTJ.2018.02.555594.

Profile of top 10 most productive organizations

396 organizations participated in global thalassemia research, of which 306 organizations contributed 1-5 papers each, 44 organizations 6-10 papers each, 37 organizations 11-20 papers each, 7 organizations 21-30 papers each and 2 organizations 31-45 papers each. The productivity of 10 most productive organizations in global thalassemia research varied from 19 to 45 publications and together contributed 27.28% (281 publications) publication share and 56.46% (5922) citation share to its cumulative publications output during 2008-17. The scientometric profile of these 10 organizations is presented in Table 5.

Table 5: Scientometric Profile of Top 10 Most Productive Global Organizations in Thalassemia Research during 2008-17.

S.No	Name of the Organization	TP	TC	CPP	HI	ICP	%ICP	RCI
1	University College London, U.K.	45	1009	22.42	16	28	62.22	2.2
2	Mahidol University, Thailand	34	390	11.47	12	16	47.06	1.13
3	University of Oxford, U.K.	30	534	17.8	11	17	56.67	1.75
4	Universita degli Studi di Milano, Italy	29	821	28.31	13	17	58.62	2.78
5	Weatherall Institute of Molecular Medicine, U.K.	28	884	31.57	12	16	57.14	3.1
6	University of Athens, Greece	27	414	15.33	10	10	37.04	1.51
7	King's College, London	24	368	15.33	9	7	29.17	1.51
8	IRCCS Foundation, Rome, Italy	23	601	26.13	10	13	56.52	2.57
9	American University Beirut Medical Centre, Lebanon	22	477	21.68	9	14	63.64	2.13
10	Ospedale Maggiore Policlinico Milano, Italy	19	424	22.32	8	5	26.32	2.19
	Total of 15 organizations	281	5922	21.07	11	143	50.89	2.07
	Total of World	1030	10489	10.18				
	Share of top 15 organizations in World's total	27.28	56.46					

TP=Total Papers; TC=Total Citations; CPP=Citations Per Paper; HI=h-index; ICP=International Collaborative Papers; RCI=Relative Citation Index

a) Four organizations have registered higher publications output than the group average of 28.10: University College London, U.K. (45 papers), Mahidol University, Thailand (34 papers), University of Oxford, U.K. (30 papers) and Universita degli Studi di Milano, Italy (29 papers) during 2008-17;

b) Six organizations have registered more than the average citation per publication (21.07) Weatherall Institute of Molecular Medicine, U.K. (31.57), Universita degli Studi di Milano, Italy (28.31), IRCCS Foundation, Rome, Italy (26.13), University College London, U.K. (22.42), Ospedale Maggiore Policlinico Milano, Italy (22.32) and American University Beirut Medical Centre, Lebanon (21.68) during 2008-17;

c) Six organizations have achieved more than the average share of international collaborative publications (50.89%): American University Beirut Medical Centre, Lebanon (63.64%), University College London, U.K. (62.22%), Universita degli Studi di Milano, Italy (58.62%), Weatherall Institute of Molecular Medicine, U.K. (57.14%), University of Oxford, U.K. (56.67%) and IRCCS Foundation, Rome, Italy (56.52%) during 2008-17;

d) Six organizations have registered the relative citation index more than average (2.07): Weatherall Institute of Molecular Medicine, U.K. (3.10), Universita degli Studi di Milano, Italy (2.78), IRCCS Foundation, Rome, Italy (2.57), University College London, U.K. (2.20), Ospedale Maggiore Policlinico Milano, Italy (2.19) and American University Beirut Medical Centre, Lebanon (2.13) during 2008-17.

Profile of top 10 most productive authors

594 authors participated in global thalassemia research, of which 518 authors contributed 1-5 papers each, 59 authors 6-10 papers each, 16 authors 11-20 papers each and 1 author 27 papers. The productivity of 15 most productive authors in global thalassemia research varied from 12 to 27 publications and together contributed 15.05% (155 publications) publication share and 24.77% (2598) citation share to its cumulative publications output during 2008-17. The scientometric profile of these 10 authors is presented in Table 6.

Table 6: Top 10 Most Productive Authors in Global Thalassemia Research, 2008-17.

S.No	Name of the Author	Affiliation of the Author	TP	TC	CPP	HI	ICP	%ICP	RCI
1	M.D. Coppellini	Fondazione IRCCS ca Granda, University of Milan, Italy	27	731	27.07	11	15	55.56	2.66
2	V.De Sanctis	Quisisana Hospital Ferrara, Italy	17	65	3.82	5	7	41.18	0.38
3	S. Fucharoen	Mahidol University, Thailand	16	261	16.31	10	8	50	1.6

How to cite this article: Ritu Gupta, Gupta BM. Global Thalassemia Research: A Scientometric Assessment of Publications Output during 2008-17. Open Acc Blood Res Trans J. 2018; 2(4): 555594. DOI: 10.19080/OABTJ.2018.02.555594.

4	E. George	Universiti Putra Malaysia Selangor, Malaysia	16	62	3.88	4	0	0	0.38
5	A.T. Taher	American University Beirut Medical Centre, Lebanon	16	300	18.75	7	10	62.5	1.84
6	R. Galanello	Ospedale Regionale MIcrocitemia, Universita di Cagliari, Italy	14	347	24.79	9	7	50	2.43
7	S.L. Thein	King's College London, U.K.	13	194	14.92	6	6	46.15	1.47
8	S. Daar	Sultan Qaboos University, Muscat. Oman	12	267	22.25	5	9	75	2.19
9	A.Kattamis	Children University Hospital of Athens, Greece	12	160	13.33	8	5	41.67	1.31
10	A.Maggio	U.O.C. Ematologia II Con Talassemio, AOV Cervello, Italy	12	211	17.58	6	3	25	1.73
		Total of 10 authors	155	2598	16.76	7.1	70	45.16	1.65
		Total of the World	1030	10489	10.18				
		Share of 10 authors in World output	15.05	24.77					
TP=Total Papers; TC=Total Citations; CPP=Citations Per Paper; HI=h-index; ICP=International Collaborative Papers; RCI=Relative Citation Index									

a) Four authors have registered higher publications output than the group average of 15.5: C. M.D. Coppellini (27 papers), V. De Sanctis (17 papers), E. George and A.T. Taher (16 papers each) during 2008-17;

b) Five authors have registered more than the average citation per publication (16.76) of all authors: M.D. Coppellini (27.07), R. Galanello (24.79), S. Daar (22.25), A.T. Taher (18.75) and A.Maggio (17.58) during 2008-17;

c) Six authors have achieved more than the average share of international collaborative publications (45.16%) of all authors: T S. Daar (75.0%), A.T. Taher (62.50%), M.D. Coppellini (55.56%), S. Fucharoen and R. Galanello (50.0% each) and S.L. Thein (46.15%) during 2008-17;

d) Five authors registered the relative citation index more than average (1.65) of all authors: M.D. Coppellini (2.66), R. Galanello (2.43), S. Daar (2.19), A.T. Taher (1.84) and A. Maggio (1.73) during 2008-17.

Medium of communication

996 journal papers were published in 369 journals in global thalassemia research, of which 337 journals contributed 1-5 papers each, 20 journals 6-10 papers each, 8 journals 11-20 papers each, 2 journals 21-30 papers each, and 33-123 papers each. The 15 most productive journals in global thalassemia research contributed from 8 to 123 papers and together contributed 34.74% share (346 papers) to the total journal publication output during 2008-17. The publication share of these top 15 most productive journals increased from 34.33% to 35.22% from 2008-12 to 2013-17. The most productive journal (with 123 papers) was *British Journal of Haematology*, followed by *European Journal of Haematology* (33 papers), *Blood Transfusion* (23 papers), *Cochrane Database of Systematic Reviews* (23 papers), *Journal of Clinical & Diagnostic Research* (19 papers), *International Journal of Laboratory Haematology* (18 papers), etc. during 2008-17 (Table 7).

Table 7: List of Top 15 Most Productive Journals in Global Thalassemia Research during 2008-17.

S.No	Name of the Journal	Number of Papers		
		2008-12	2013-17	2008-17
1	British Journal of Haematology	68	55	123
2	European Journal of Haematology	24	9	33
3	Blood Transfusion	13	10	23
4	Cochrane Database of Systematic Reviews	3	20	23
5	Journal of Clinical & Diagnostic Research	1	18	19
6	International Journal of Laboratory Haematology	12	6	18
7	Indian Journal of Medical Research	10	7	17
8	Pediatric Endocrinology Reviews	0	15	15
9	Acta Haematologica	8	4	12
10	Eastern Mediterranean Health Journal	9	3	12
11	Journal of Medical Screening	7	5	12

How to cite this article: Ritu Gupta, Gupta BM. Global Thalassemia Research: A Scientometric Assessment of Publications Output during 2008-17. Open Acc Blood Res Trans J. 2018; 2(4): 555594. DOI: 10.19080/OABTJ.2018.02.555594.

12	Journal of Pakistan Medical Association	8	4	12
13	Rivista Italiana Di Medicana Dell Adolescenza	10	0	10
14	Medical Journal of Malaysia	7	2	9
15	Blood Cells Molecules & Diseases	4	4	8
	Total of 15 Journals	184	162	346
	Total of World	536	460	996
	Share of 15 journals in World journal output	34.33	35.22	34.74

Highly cited papers

There were 8 highly cited papers, which have received citations from 118 to 694 during 2008-17. These 8 highly cited papers together received 1949 citations, leading to average citation per paper of 243.625.

a) Of the 8 highly cited papers, all involved the participation of two or more organizations (of which 3 national collaborative and 5 international collaborative).

b) Among high cited papers, the largest participation, was with from U.K. (6 papers), followed by USA (3 papers), Italy (2 papers), Canada, Germany, Greece, Lebanon and Netherlands (1 paper each).

c) Among 8 highly cited papers, 4 appeared as articles, 3 as reviews and 1 as conference paper.

d) The 8 highly cited papers involved the participation of 99 authors and 60 organizations.

e) These 8 highly cited papers were published in 6 journals, of which 3 papers in *British Journal of Haematology* and 1 paper each in *European Journal of Haematology, Journal of Cardiovascular Magnetic Resonance, The Lancet,* Nature and *Orphanet Journal of Rare Diseases.*

Summary

1030 global publications on thalassemia research, as indexed in Scopus database, were published during 2008-17 and they decreased from 133 to 98 in the year 2008 to the year 2017, registering -1.63% growths per annum. Their cumulative global publication output on thalassemia research decreased from 558 to 472, witnessing -15.41% growth from 2008-12 to 2013-17. The citation impact per paper of global publications in thalassemia research was averaged to 10.18 during 2008-17, however, decreasing from 15.45 CPP during 2008-12 to 3.96 CPP during 2013-17.

The global publication share of the top 10 most productive countries among 75 participating countries in thalassemia research varied from 3.50% to 17.86% during 2008-17, with highest publication share (17.86%) coming from U.K., followed by Italy (14.47%), USA (9.61%), India (8.93%), Greece (6.60%), Malaysia and Thailand (5.73% and 5.44%), Pakistan, and Australia (4.85% and 4.66%) ,and Iran (3.50%) during 2008-17. Together these top 10 countries contributed 81.65% global share and more than 100% of the world publication and citations output during 2008-17. The global publication share, however increased from 80.11% to 83.47% from 2008-12 to 2013-17. The global publication share showed increase in Greece, U.K., Italy, Iran and USA (from 0.08% to 1.09%), as against decrease in Malaysia, India, Thailand, Australia and Pakistan (from 0.02% to 1.48) from 2008-11 to 2012-17. Three out of 10 countries have scored relative citation index more than the average of 1.34: USA (2.62), Italy (1.75) and U.K. (1.71) during 2008-17.

Medicine, contributed the largest publications share of 86.89% in thalassemia research, followed by biochemistry, genetics & molecular biology (17.86%), pharmacology, toxicology & pharmaceutics (2.82%) and immunology & microbiology (2.04 during 2008-17. As per the Scopus database classification, the global thalassemia research output is distributed across four sub-fields during 2008-17. The publication activity showed decrease in medicine, as against increase in biochemistry, genetics & molecular biology, pharmacology, toxicology & pharmaceutics and immunology & microbiology from 2008-12 to 2013-17. Among seven subjects, biochemistry, genetics & molecular biology registered the highest citation per paper of 9.83 among four subjects, followed by medicine (9.75), biochemistry, genetics & molecular biology (9.38), pharmacology, toxicology & pharmaceutics (9.38) and immunology & microbiology (6.43) during 2008-17 .

Beta Thalassemia, among different types of thalassemia research, accounted for the highest global share (57.38% share), followed by Alpha Thalassemia (19.13% share), Haemoglobin E Thalassaemia ssaemia (5.92% share), etc. during 2008-17. The global publication share increased in case of Alpha Thalassemia and Delta Thalassemia, as against decrease in case of Beta Thalassemia, Haemoglobin E Thalassemia, Haemoglobin S Thalassemia, Haemoglobin C Thalassemia and Haemoglobin D Thalassemia from 2008-12 to 2013-17.

Among 396 organizations and 594 authors contributing to global thalassemia research, the 10 most productive global organizations and authors together contributed 27.28% and 15.05% respectively as their share of global publication output and 56.46% and 24.77% respectively as their share of global citation output during 2008-17. The leading organizations in research productivity were: University College London, U.K. (45 papers), Mahidol University, Thailand (34 papers), University of Oxford, U.K. (30 papers) and Universita degli Studi di Milano, Italy (29 papers) during 2008-17. The leading organizations in terms of relative citation index were: Weatherall Institute of Molecular Medicine, U.K. (31.57), Universita degli Studi di

How to cite this article: Ritu Gupta, Gupta BM. Global Thalassemia Research: A Scientometric Assessment of Publications Output during 2008-17. Open Acc Blood Res Trans J. 2018; 2(4): 555594. DOI: 10.19080/OABTJ.2018.02.555594.

Milano, Italy (28.31), IRCCS Foundation, Rome, Italy (26.13), University College London, U.K. (22.42), Ospedale Maggiore Policlinico Milano, Italy (22.32) and American University Beirut Medical Centre, Lebanon (21.68) during 2008-17.

British Journal of Haematology was the most productive journal (with 123 papers) in global thalassemia research, followed by E*uropean Journal of Haematology* (33 papers), *Blood Transfusion* (23 papers), Cochrane Database of Systematic Reviews (23 papers), *Journal of Clinical & Diagnostic Research* (19 papers), *International Journal of Laboratory Haematology* (18 papers), etc. during 2008-17. Among the 996 journal papers (in 369 journals) in global thalassemia research, the top 15 most productive journals contributed 34.74% share of total journal publication output during 2008-17, which increased from 34.33% to 35.22% from 2008-12 to 2013-17.

There were 8 highly cited papers, which have received citations from 118 to 694 during 2008-17 and together have received 1949 citations, with an average citation per paper of 243.625. These 8 highly cited papers resulted from participation of 99 authors and 60 organizations and were published in 6 journals, of which 3 papers in British Journal of Haematology and 1 paper each in European Journal of *Haematology, Journal of Cardiovascular Magnetic Resonance, The Lancet, Nature and Orphanet Journal of Rare Diseases.*

Conclude that there is an urgent need to review the current status of epidemiology, management and control of Thalassemia disorders globally. In this context, there is a need to identify the local and regional problems, needs and priorities for improving control policies; to prepare guidelines for the control of Thalassemia disorders; fundraising to support programs for control of Thalassemia disorders and develop cost-effective approaches and interventions for the control of Thalassemia disorders.

References

1. Thalassemia. 9 July 2018. https://en.wikipedia.org/wiki/Thalassemia (Accessed on 12 July 2018).
2. What is thalassemia? 2005-2018. https://www.healthline.com/health/ thalassemia#managing-thalassemia (Accessed on 12 July 2018).
3. Thalassemias. N.d. https://www.nhlbi.nih.gov/health-topics/thalassemias (Accessed on 12 July 2018).
4. https://www.tribuneindia.com/news/trends/the-battle-of-thalassaemia/413128.html
5. Daneshmand AR, Forouzandeh H, Azadi M, Cheraghzadeh Dezfuli S (2015) A bibliometric analysis of haematological research productivity among five Islamic countries during 1996 to 2013 (a 17 years period). Iranian Journal of Blood and Cancer 7(2): 67-74.
6. Gupta BM (2012) Heredity Blood Disorders (HBD): A Scientometric Analysis of Publications Output from India during 2002-2011. J Blood Disorders & Transfusion 3:126.

DOI: 10.19080/OABTJ.2018.02.555594

How to cite this article: Ritu Gupta, Gupta BM. Global Thalassemia Research: A Scientometric Assessment of Publications Output during 2008-17. Open Acc Blood Res Trans J. 2018; 2(4): 555594. DOI: 10.19080/OABTJ.2018.02.555594.