



A Bibliometric Study of Research Output of BRICS on Eye Neoplasm

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Abstract

This study is conducted to assess chronological growth of research publications on eye neoplasm, along with authorship pattern, highly cited papers, most prolific authors and journals on the subject. The bibliographical information of research publications on eye neoplasm has been retrieved from PubMed database. An advanced search was conducted in PubMed database to collect bibliographical data of publications on eye neoplasm from BRICS published during 1 January 2010 to 31 December 2015. A total of 791 papers were contributed by BRICS on eye neoplasm during 2010 to 2015. About 318 (40.20%) articles were contributed by more than five authors. China has dominated over other four countries by contributing highest number of publications (360 papers) and Indian authors have grabbed first three ranks by contributing highest number of papers.

Keywords: Bibliometric, Eye Neoplasm, Eye Cancer, BRICS

1. Introduction

Eye neoplasm can be defined as tumors or cancer of the eye. Eye cancer is an uncommon tumor that can affect any part of the eye and it can be either congenital or acquired. Tumors can appear on the iris, cornea, conjunctiva, eyelid, orbit, and also inside the eye in structures such as the retina, ciliary body, choroid, and optic disc. Tumors in the eye and nearby tissue can be benign tumors such as dermoid cysts or a malignant tumor like rhabdomyosarcoma and retinoblastoma. Eye neoplasms can be primary (starts within the eye) and metastatic cancer (spread to the eye from another organ)⁷. Lung cancer and breast cancer are two most common cancers that spread to the eye from another organ. Eye tumors can even spread the optic nerve, the brain and the rest of the body, therefore early diagnosis and treatment are extremely important. Treatment for eye cancer varies by the type, size and aggressiveness of the tumor, and other factors. Treatment may include surgery, radiation therapy, freezing or heat therapy, or laser therapy. This study applies bibliometric techniques to map out growth trends of literature on eye neoplasm.



2. Objectives

This study presents bibliometric analysis of research publications of BRICS on eye neoplasm to study following aspects:

- Year-wise growth of research publications on eye neoplasm
- Authorship pattern and most prolific authors on the subject
- Highly cited papers on eye neoplasm and
- Most prolific journals on the subject

3. Methodology

PubMed, a free search engine maintained by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine (NLM) was used to retrieve the bibliographical information of research publications on eye neoplasm. An advanced search was conducted in PubMed database to collect bibliographical information of journal articles on eye neoplasm from BRICS published during 2010-2015.

4. Analysis and Results

Table 1
Year-wise Contribution of BRICS

Year	Name of Country					Total Publications
	Brazil	Russia	India	China	South Africa	
2010	11	2	34	46	1	94 (11.88%)
2011	14	0	45	42	2	103 (13.02%)
2012	13	1	55	65	1	135 (17.07%)
2013	13	3	54	61	1	132 (16.69%)
2014	10	0	68	71	6	155 (19.60%)
2015	10	4	79	75	4	172 (21.74%)
Total	71 (8.98%)	10 (1.26%)	335 (42.35%)	360 (45.51%)	15 (1.90%)	791

Table 1 depicts that BRICS have contributed 791 papers on eye neoplasm during 2010-2015. The publication output of BRICS on eye neoplasm has increased from 94 papers in 2010 to 172 papers in 2015. China has contributed 360 (45.51%) of the total 791 papers from BRICS on eye neoplasm, followed by India with 335 (42.35%) papers. Brazil and South Africa has contributed 71 and 15 publications. Among BRICS, Russia has contributed least number (1.26%) of papers on eye neoplasm.

Table 2
Authorship Pattern

Years	Authorship Pattern					
	Single Author	Two Authors	Three Authors	Four Authors	Five Authors	Six or more Authors
2010	1	2	17	17	18	39
2011	2	10	11	21	14	45
2012	1	11	17	28	19	59
2013	-	7	25	29	19	52
2014	3	15	21	34	30	52
2015	7	16	18	29	31	71
Total	14	61	109	158	131	318
Percentage	1.77%	7.71%	13.78%	19.98%	16.56%	40.20%

The above table reveals that 318 (40.20%) articles were contributed by more than five authors, followed by 158 (19.98%) articles by four authors. About 16.56% papers were contributed by five authors and 13.78% by three authors. Nearly 7.71% articles have been written in joint authorship. Only 1.77% papers were contributed by single authors on eye neoplasm from BRICS. The findings make it clear that there are collaborative research efforts and scientific groups working on the subject. To calculate the degree of authorship collaboration, formula given by Subramanyamis used (1983):

$$C = \frac{Nm}{Nm + Ns} C = \frac{777}{777 + 14} = 0.98$$

[C=degree of authorship collaboration, Nm= Number of multiple-authored papers Ns=number of single-authored papers]

Table 3
Most Prolific Journals

Title of the Journal	Publishing Country	No. of Papers	Scimago H-Index
Zhonghua Yan KeZaZhiChinese Journal of Ophthalmology	China	57	5
Indian Journal of Ophthalmology	India	56	43
Ophthalmic Plastic and Reconstructive Surgery	USA	28	51
Chinese Medical Journal	China	20	54
Journal of Craniofacial Surgery	USA	19	66
British Journal of Ophthalmology	UK	18	137
Orbit	UK	18	28
PLoS One	USA	16	268
Molecular Vision	USA	14	83



Arquivos Brasileiros de Oftalmologia	Brazil	13	24
BMJ Case Reports	UK	13	20
Journal of Cancer Research and Therapeutics	India	13	30
Graefe's Archive for Clinical and Experimental Ophthalmology	Germany	13	89
Total of 13 journals		298	
BRICS Total Publications		791	
Share of top 13 authors in BRICS total		37.67%	

Table 3 makes it clear that top 13 journals published 298 papers on eye neoplasm. These journals have 37.67% share in publication output of BRICS on eye neoplasm during 2010-2015. Zhonghua Yan Ke Za Zhi Chinese Journal of Ophthalmology occupied first rank with 57 papers, followed by Indian Journal of Ophthalmology (56 papers), Ophthalmic Plastic and Reconstructive Surgery (28 papers), Chinese Medical Journal (20 papers). Of these journals, 4 were published from USA, 3 from UK, 2 each from India and China and 1 each from Germany and Brazil.

Table 4
Most Productive Authors

Name of the Author	Affiliation	No. of Papers Published
S. Krishnakumar	Department of Ocular Pathology, Vision Research Foundation, Chennai, India	38
S. Kashyap	All India Institute of Medical Sciences, New Delhi, India	33
N. Pushker	All India Institute of Medical Sciences, New Delhi, India	30
B. Li	Beijing Institute of Ophthalmology, Beijing Tongren Eye Center, Beijing Tongren Hospital, China Capital Medical University, Beijing Ophthalmology & Visual Sciences Key Laboratory, Beijing, China	29
X. Xu	Beijing Institute of Ophthalmology, Beijing Tongren Eye Center, Beijing Tongren Hospital, China Capital Medical University, Beijing Ophthalmology & Visual Sciences Key Laboratory, Beijing, China	29
S.G. Honavar	LV Prasad Eye Institute, Hyderabad, Andhra Pradesh, India	28
Y. Wang	Qilu Hospital of Shandong University, Jinan, China	28
S. Sen	All India Institute of Medical Sciences, New Delhi, India	27
X. Fan	Shanghai Jiao Tong University, University School of Medicine, Shanghai, China	24
S. Bakhshi	All India Institute of Medical Sciences, New Delhi, India	22
S. Kaliki	L V Prasad Eye Institute, Hyderabad, Andhra Pradesh, India	21
B. Chawla	All India Institute of Medical Sciences, New Delhi, India	20
V. Khetan	Shri Bhagwan Mahavir Vitreo-Retinal Services and Ocular Oncology Services, Medical Research Foundation, Chennai, Tamil Nadu, India	20



S. Ge	Ninth People's Hospital; Shanghai Jiaotong University School of Medicine; Shanghai, P.R. China	20
J. Wang	Ninth People's Hospital; Shanghai Jiaotong University School of Medicine; Shanghai, PR China	20
Total		389
BRICS Total Publications		791
Share of top 15 authors in BRICS total		49.18%

The research productivity of top 15 authors from BRICS on eye neoplasms is depicted in above table. The top 15 authors have 49.18% share in publication output of BRICS on eye neoplasm during 2010-2015. Eight authors have publication output higher than the group average of 25.93: S. Krishnakumar (38 papers), S. Kashyap (33 papers), N. Pushker (30 papers), B. Li and X. Xu (29 papers each), S. G. Honavar and Y. Wang (28 papers each), S. Sen (27 papers).

Table 5
Highly Cited Papers on Eye Neoplasm

Title	Authors	Name of Journal	Google Scholar Citations	Country
Hippo-independent activation of YAP by the GNAQ uveal melanoma oncogene through a trio-regulated rho GTPase signaling circuitry.	Feng <i>et al.</i>	Cancer Cell, 2014, 25(6), p. 831-45	192	China
Mutant Gq/11 promote uveal melanoma tumorigenesis by activating YAP	Yu <i>et al.</i>	Cancer Cell, 2014 25(6), p. 822-30	162	China
Optical coherence tomography enhanced depth imaging of choroidal tumors.	Torres <i>et al.</i>	American Journal of Ophthalmology, 2011, 151(4), p. 586-593	136	Brazil
Ultraviolet light and ocular diseases.	Yam and Kwok	International Ophthalmology, 2014, 34(2), p. 383-400	115	China
Cancer incidence among children and adolescents in Brazil: first report of 14 population-based cancer registries.	de Camargo <i>et al.</i>	International Journal of Cancer, 2010, 126(3), p. 715-20	100	Brazil



Top 5 highly cited papers on eye neoplasm are listed in above table. Together, these papers were cited 705 times. Of the top highly cited papers, 3 were contributed by China and remaining 2 by Brazil.

5. Conclusion

The present study reveals that number of research publications on eye neoplasm have increased from 94 in 2010 to 172 in 2015. Among BRICS, China is the leading contributor with 360 publications followed by India with 335 papers. Zhonghua Yan KeZaZhi Chinese Journal of Ophthalmology has published highest number of papers in the field. Krishnakumar from Vision Research Foundation, Chennai, India is the leading contributor in the area of eye neoplasm with 38 articles

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