

A 10-year survey of literature in ophthalmology journals from Chinese authors

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Abstract

• It's right ten years since Vision 2020 was first initiated. Although it was suggested that China ranked the fifth in the top 20 countries sorted by articles in all fields from Essential Science Indicators, the research status in ophthalmology from Chinese authors in various parts were unknown. We aimed to compare the outputs of ophthalmology articles published in international journals from the three major regions of China - Mainland (ML), Hong Kong (HK) and Taiwan (TW) during the past ten years. Articles published in ophthalmology journals originating from the ML, TW and HK from 2000 to 2009 were retrieved from the PubMed database. The number of articles, impact factors (IF) and articles published in top ophthalmology journals were conducted for quantity and quality comparison. There were 2493 articles from ML (1076), TW (784) and HK (633). The total number of articles from the three regions increased significantly from 2000 to 2009 (from 99 to 491). The number of articles published per year from the ML has exceeded those from TW and HK in 2006. The accumulated IF of the articles from ML (2565.108) was higher than TW (1794.049) and HK (1544.021). HK had the highest average IF of ophthalmology articles among the three regions. The ML had great progress in quantity of ophthalmology articles published in international journals and was narrowing the article quality gap with the other two regions during the past ten years.

• **KEYWORDS:** ophthalmology journal; Chinese author; literature; Science Citation Index Expanded

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INTRODUCTION

It's right ten years since Vision 2020 was first initiated. Cataract remains the leading cause of vision impairment

and blindness in China^[1,2]. Prevention of blindness is still a great challenge faced by Chinese ophthalmology^[2,3]. Although it was suggested that China ranked the fifth in the top 20 countries sorted by articles in all fields from Essential Science Indicators (January 1999-August 31, 2009)^[4], the scientific publications in ophthalmology field by Chinese authors were not reported. The Mainland as the biggest part of China had been lagged behind the other parts according to some history and language reasons. What's going on in these 10 years? We therefore intended to reveal the contribution of Chinese authors in major regions of China-the Mainland (ML), Hong Kong (HK) and Taiwan (TW)-to the research in the field of ophthalmology.

MATERIALS AND METHODS

Materials A total of 55 journals related to ophthalmology were selected from the "ophthalmology" category of Science Citation Index Expanded (SCIE) subject categories by the Institute for Scientific Information (ISI)^[5]. Transactions of the Ophthalmological Society of Australia was excluded because it had no ISSN. Spektrum der Augenheilkunde, Iranian Journal of Ophthalmology, were excluded because they were not indexed for MEDLINE. The category covers resources dealing with the diagnosis and treatment of eye disease and focuses on eye disease prevention, pharmacology, surgery, transplantation, and research. A computerized literature search was conducted in the PubMed database in July 8, 2010^[6]. Articles published from the ML, TW and HK from January 2000 to December 2009 in these journals were elicited, respectively. The ISSN (Print) was used to perform searches in PubMed. The search terms used were: "1755-375X OR 0002-9394 OR 1530-4086 OR 0003-9950 OR 0004-2749 OR 0007-1161 OR 0008-4182 OR 1442-6404 OR 0816-4622 OR 0277-3740 OR 0271-3683 OR 1040-8738 OR 1556-9527 OR 0012-4486 OR 1120-6721 OR 0014-4835 OR 0950-222X OR 1542-2321 OR 0721-832X OR 0301-4738 OR 0146-0404 OR 0021-5155 OR 0181-5512 OR 1091-8531 OR 0886-3350 OR 1057-0829 OR 1070-8022 OR 1080-7683 OR 0191-3913 OR 1081-597X OR 1534-7362 OR 0023-2165 OR 1090-0535 OR 0165-8107 OR 0927-3948 OR 1542-0124 OR 0275-5408 OR 0928-6586 OR 1381-6810 OR 0740-9303 OR 0030-3747 OR 1542-8877 OR 0941-293X OR 0030-3755 OR 0161-6420 OR 1040-5488 OR 1350-9462 OR 0275-004X OR 0034-7280 OR 0039-6257 OR 0042-6989 OR 0952-5238" AND "Hong Kong[ad]", "Taiwan[ad]", and "China[ad] NOT Hong Kong[ad] NOT Taiwan[ad]". Articles that showed the first author's affiliation (ad) with the three regions

were considered as research output from the regions. The number of articles in the fields of clinical trials, randomized controlled trials (RCT) and case reports were generated respectively, according to the publication types by PubMed.

Methods To compare the quality of the research articles, the accumulated impact factors (IF) and the average IF were generated according to Journal Citation Reports (JCR) 2009 established by the ISI^[7]. Articles related to ophthalmology were extracted first independently and subsequently in consensus if a disagreement existed between the reviewers (Pan DY and Zhao SH) by viewing the titles, abstracts and full text if necessary. Articles published on the top 10 high impact ophthalmology journals were also generated. Furthermore, we determined the top 10 popular ophthalmology journals of the three regions according to the published article numbers.

Statistical Analysis This study was performed by STATA 9.0. The nonparametric test for trend was performed to determine any significant change of the total numbers over the period of time. Kruskal-Wallis test was used for detecting the difference among the three regions, and rank-sum test between two when necessary. The test for significance was two-tailed. $P < 0.05$ was considered significant.

RESULTS

Articles Number A total number of 79 063 articles were published in the selected 54 journals from 2000 to 2009 worldwide. There were 2 493 articles (2 493/79 063, 3.2%) from ML (1 076/2 493, 43.2%), TW (784/2 493, 31.4%) and HK (633/2 493, 25.4%). The numbers increased significantly from 2000 to 2009 in the three regions (from 14 to 320, $P < 0.01$; 33 to 106, $P < 0.05$; 52 to 65, $P < 0.05$, respectively, Figure 1). From 2006 onwards, the number of articles published from the ML exceeded that from HK and TW. The share of articles increased significant in ML ($P < 0.01$) and decreased significantly in HK ($P < 0.01$) but not in TW ($P = 0.07$, Figure 2).

In the clinical trial, randomly controlled trial and case report, there were 559 articles (559/2 493, 22.4%) from ML (142/559, 25.4%), TW (235/559, 42.0%) and HK (182/559, 32.6%). There was no difference among the three regions (ML vs TW vs HK, $P = 0.179$, Figure 3).

Impact Factor According to the JCR 2009, 49 journals of ophthalmology had IF^[8]. 4 journals in our study had no IF. After excluding these journals, it seemed that the accumulated IF of articles from ML (2 568.108) was higher than TW (1 794.049) and HK (1 544.021, $P = 0.887$). HK had the highest average IF of 2.439, followed by ML of 2.383, TW of 2.288 ($P = 0.15$, Table 1). A total number of 860 (31.4%) articles from the three regions were published in the top 10 ophthalmology journals. ML published 317 articles in the high impacted ophthalmology journals, while TW and HK had 278 and 265 articles, respectively, in the top 10 journals (Table 2). In the journal Progress in Retinal and Eye Research which had the highest IF, TW had 2 articles and HK had 1 while ML had 0.

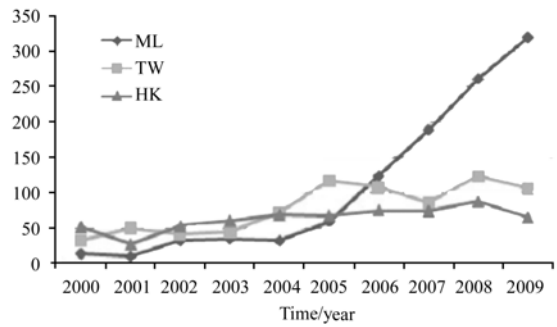


Figure 1 Total number of articles per year during the past ten years.

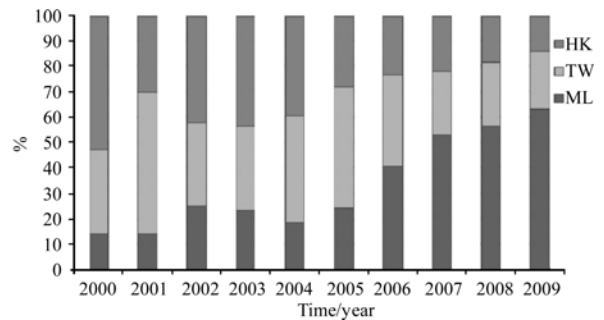


Figure 2 The share of articles during the past ten years.

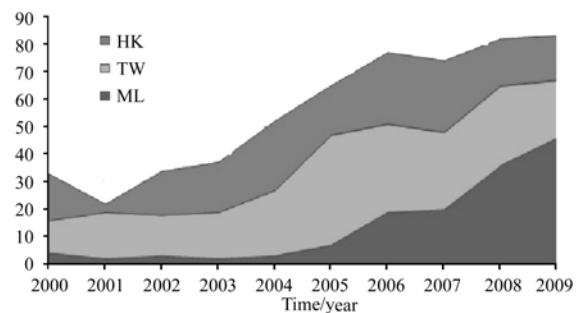


Figure 3 Numbers of clinical articles during the past ten years.

Table 1 Accumulated and average impact factors of articles

| Year | Accumulated impact factor | | | Average impact factor | | |
|-------|---------------------------|----------|----------|-----------------------|-------|-------|
| | ML | TW | HK | ML | TW | HK |
| 2000 | 39.035 | 63.443 | 140.657 | 2.788 | 1.923 | 2.705 |
| 2001 | 20.605 | 106.348 | 67.491 | 2.061 | 2.085 | 2.410 |
| 2002 | 69.175 | 101.666 | 118.653 | 2.162 | 2.480 | 2.239 |
| 2003 | 80.034 | 105.249 | 147.569 | 2.287 | 2.339 | 2.419 |
| 2004 | 81.999 | 162.885 | 162.752 | 2.562 | 2.231 | 2.359 |
| 2005 | 141.522 | 263.662 | 149.766 | 2.399 | 2.254 | 2.202 |
| 2006 | 341.023 | 261.468 | 177.675 | 2.750 | 2.421 | 2.369 |
| 2007 | 416.056 | 201.977 | 187.978 | 2.201 | 2.349 | 2.540 |
| 2008 | 612.877 | 283.557 | 222.212 | 2.348 | 2.287 | 2.525 |
| 2009 | 762.782 | 243.794 | 169.268 | 2.384 | 2.300 | 2.604 |
| Total | 2565.108 | 1794.049 | 1544.021 | 2.384 | 2.288 | 2.439 |

Journal Analysis The most popular journals in the three regions were listed in Table 3. Mol Vis was the most popular journal in ML and Eye was the most popular journal in TW, while in HK it was Invest Ophthalmol Vis Sci. Ophthalmology, Invest Ophthalmol Vis Sci, Am J Ophthalmol and Eye appeared in all top 10 journals in the three regions.

DISCUSSION

In 1999, the WHO and the IAPB launched the 'Vision 2020: Right to Sight' programme, aiming to decrease the number of

Table 2 Articles published in the top 10 ophthalmology journals

| Rank | Journal | 2009IF | ML (%) | TW (%) | HK (%) | Total |
|-------|---------------------------|--------|---------|---------|---------|-------|
| 1 | Progr Retinal Eye Res | 7.755 | 0 | 2(67) | 1(33) | 3 |
| 2 | Ophthalmology | 5.491 | 44(39) | 33(29) | 35(31) | 112 |
| 3 | Ocular Surface | 4.222 | 0 | 1(100) | 0 | 1 |
| 4 | Arch Ophthalmol | 3.859 | 13(27) | 15(31) | 20(42) | 48 |
| 5 | Am J Ophthalmol | 3.833 | 49(37) | 59(44) | 25(19) | 133 |
| 6 | Invest Ophthalmol Vis Sci | 3.431 | 114(47) | 56(23) | 72(30) | 242 |
| 7 | J Vis | 3.022 | 15(68) | 3(14) | 4(18) | 22 |
| 8 | Retina | 2.932 | 24(37) | 30(46) | 11(17) | 65 |
| 9 | Br J Ophthalmol | 2.917 | 33(32) | 21(20) | 49(48) | 103 |
| 10 | J Cataract Refract Surg | 2.745 | 22(17) | 56(44) | 48(38) | 126 |
| Total | | | 314(37) | 276(32) | 265(31) | 855 |

Table 3 The 10 most popular ophthalmology journals in Mainland (ML), Taiwan (TW) and Hong Kong (HK)

| Rank | ML(<i>n</i> = 666) | N | TW(<i>n</i> = 501) | N | HK(<i>n</i> = 405) | N |
|------|----------------------------------|-----|---------------------------|----|-----------------------------------|----|
| 1 | Mol Vis | 165 | Eye (Lond) | 63 | Invest Ophthalmol Vis Sci | 72 |
| 2 | Invest Ophthalmol Vis Sci | 114 | Cornea | 63 | Br J Ophthalmol | 49 |
| 3 | Graefes Arch Clin Exp Ophthalmol | 71 | Am J Ophthalmol | 59 | J Cataract Refract Surg | 48 |
| 4 | Curr Eye Res | 68 | J Ocul Pharmacol Ther | 59 | Clin Exp Optom | 45 |
| 5 | Am J Ophthalmol | 49 | Invest Ophthalmol Vis Sci | 56 | Eye (Lond) | 38 |
| 6 | Eye (Lond) | 47 | J Cataract Refract Surg | 56 | Ophthalmology | 35 |
| 7 | Ophthalmology | 44 | Ophthalmologica | 39 | Optom Vis Sci | 33 |
| 8 | Br J Ophthalmol | 36 | Mol Vis | 37 | Ophthalmic & Physiological Optics | 33 |
| 9 | Exp Eye Res | 36 | Ophthalmology | 33 | Am J Ophthalmol | 25 |
| 10 | Ophthalmologica | 33 | Retina | 30 | Cornea | 25 |

blind people worldwide by 2020 from the projected 75 million to 24 million. Ten years passed, what's going on in China? We first report the contribution of Chinese authors in major regions of China-ML, HK and TW-to the research in the field of ophthalmology. HK and TW have been for many years at the fore-front of scientific and medical research, and investigations from these regions having contributed some of the best scientific papers in ophthalmology. In the present study, it seems exciting that ML has improved the research in ophthalmology field, and the articles in international journals increased significantly during the past ten years. From 2006 onwards, the number of articles published from the ML exceeded that from HK and TW. There are several reasons; first, Chinese government has spent more on R&D expenditure with economic and social development these years. This results in great improvement in the research field especially in the ML. Second, with the popularization of English in the ML, more and more researchers from the ML can show their scientific research achievements in English magazines. There was no difference among the three regions with regards to RCT in last decade, but the number of RCT per year from ML have exceeded those from TW or HK from 2008 onwards. This may attribute to the large population of the ML and the investment of government and non-government organization for the prevention of blindness.

We were excited to find that the ML had the highest accumulated IF, which was different from the result we found

in other medical science, such as gastroenterology and hepatology^[9]. But, HK had the highest average IF, and the result was in concord with the result in gastroenterology and hepatology journals and in cardiology and cardiovascular journals also in pharmacology and pharmacy journals^[9-11]. We can see that the ML was narrowing the article quality gap with the other two regions during the past ten years.

On the other hand, TW and HK both have articles in the leading journal—Progress in Retinal and Eye Research, while ML has none. This indicates that although ML has progress in quantity and quality of ophthalmology articles, it still need efforts in quality of articles and in publishing in the leading journals.

The articles in this study were retrieved using the computer-generated PubMed search system, which is a comprehensive database run by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine in Bethesda, Maryland, containing articles from high-quality medical journals. This study also used data from the JCR. The JCR has been published by the Institute for Scientific Information since 1975 and represents the most comprehensive citation index to the scientific literature. It also should be mentioned here that although IF is not the optimal parameter for determining the quality of articles, since even the main journals may at times publish poor quality articles, it is at present the best available parameter for determining the quality of studies.

There are some limitations in our study. Although the journals were selected from the ophthalmology of SCIE, a few journals may cover resources beyond ophthalmology, and some journals related to ophthalmology are not included in SCIE. We also limited the author's address by ML, HK or TW, and the articles that only addressed particular Chinese cities or provinces were not included. In fact, there was also Macau included in our study in our previous design. But we later excluded it when we found there were no articles affiliated to it. We also searched articles in top, general medical journals: JAMA, NEJM and LANCET but found only one article, and it was from HK. So we did not list the result as a part of our research. In conclusion, the number of articles published from ML, TW, and HK increased significantly during the past ten years. The ML had great progress in quantity of ophthalmology articles and was narrowing the article quality gap with the other two regions during the past ten years.

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近 10a 中国作者发表在眼科 SCI 期刊的文章情况调查

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摘要

自“视觉 2020”行动发起已有 10a 余。尽管中国的文章总量在 20 强国家中排第五位,但各地区的文章分布尚不清楚。本文比较来自中国三个主要地区:大陆、香港和台湾在这 10a 内发表在国际期刊上的眼科文章情况。检索 2000/2009 年的 PubMed 数据库,分别对文章的数量,影响因子(IF)和顶级杂志发表文章数量进行比较。从 2000/2009 年,中国发表共计 2493 篇眼科相关文章,其中大陆 1076 篇,台湾 784 篇,香港 633 篇。三个地区发表的文章数量随时间推移有所增加(从 99 到 491)。自 2006 年开始,大陆发表的文章总数超过了香港及台湾。大陆累计影响因子 2565.108 分,高于台湾(1794.049)和香港(1544.021),但香港在平均影响因子分值方面最高。通过研究发现,近 10a 来大陆在 SCI 期刊发表文章的数量有很大的飞跃,并缩小了与台湾和香港之间的差距。

关键词:眼科期刊;中国作者;文献;科学引文索引