

The Emergence of the Keyword System Was Belated in the Realm of Scientific Communications Including Surgery

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Abstract

The keyword is recorded as having been used first in 1859. However, when did it begin to appear regularly in scientific publications? Actually, by 1983, it was advised that "The more key words available, the more readily will researchers interested in your subject be able to retrieve your article." Moreover, it was added that "some editors ask authors to list key words with the submitted manuscript." Therefore, when did this become a common practice? To answer this vital question, a dual search of the literature was made with particular reference (a) to my 48 sole-authored articles on cancer and (b) to those of a random 100 individual authors who published on a wide field of subjects. This 2-part search revealed significantly that the keyword belatedly appeared in the early 1970s. In particular, the available evidence pointed to a significant phenomenon called "clustering." Its manifestation was apparent through the journals published by S.KARGER, Basel, Switzerland. Its demonstration proved that the word, "lymphangiogenesis," could have been coined soon after the appearance of my 1963 paper. Thus, 6 times, I included in that paper the word, "new," with regard to the formation of lymph vessels. Hence, the premier position of my 1963 publication and those of the Swiss Publishers, KARGER, in the early 1970s, ought to be recognized in the literature.

Keywords: Definition, History, Cancer, Publication, Reprints, "Clustering", New Lymphatics, Lymphangiogenesis; Scientometrics, Surgery.

Introduction

Keyword, according to Merriam-Webster's Collegiate Dictionary, is defined as "a significant word from a title or document used especially as an index to content [7]." Since it prides itself in adding the year when a word came into existence, it added 1859. Therefore, there is need to consider its appearance in the Requested Reprint (RR) world traffic. Actually, the Editor of English for Specific Purposes, John Swales, vouched that I was "the only active researcher that I have found in the RR area [16]." In tune with his analysis, I have repeatedly propounded the theory that the RR is a tool for tracing succinct information [10-13].

Dual Literature Searches

Firstly, publications may be exemplified with my 48 solely authored reprints written from 1957. Therefore, the earliest occurrences of keywords were assembled and listed chronologically as follows:

- 1.Onuigbo WIB (1971) False firsts in cancer literature. *Oncology*, 25:163-167.
- 2.Onuigbo WIB (1972) Historical data on the dynamics of lymphatic metastases. *Oncology*, 26:505-514.
- 3.Onuigbo WIB (1973) The organ status of lymph nodes in cancer metastasis. *Oncology*, 28:227-231.
- 4.Onuigbo WIB (1974) Organ selectivity in human cancer metastasis. A review. *Oncology*, 30:294-303.

In sum, 1971 was the year that my contribution first contained keywords. Then, those of 1972, 1973, and 1974 followed close by. Was this nearness due to the role of "clustering"? According to Frame, Narin and Carpenter, "clustering" is a significant feature of informatics [3]. This accommodative word means the tendency for a distinct group to stand out among any cohort that is concerned "not only with research activities but also the production of scientific literature." Incidentally, I had previously surveyed 44 of my scientific papers with regard to their citability by USA authors [11]. This was done strictly according to their states of affiliation. In this way, I confirmed the theory of "cluttering" from several angles. Thus, a good example was that, out of those living in the state of New York, although fully 85% of them cited me 126 times, yet only New York City itself stood out. It was the same with my personal chronicled 4 out of 48 publications, seeing that keywords clustered only in *Oncology*, a journal published in Switzerland!

Switzerland was therefore next considered with special reference to its publication role in the crucial worldwide RR traffic. Moreover, it occurred to me to limit this second search to single authors like me. Furthermore, as 100 is often chosen as a reasonable cohort, the search consisted of a random selection of

100 individually authored reprints, providing that the works had appeared in Current Contents [4]. This magazine was editorially recommended as an open sesame in literature searches [8]. Moreover, this had to follow strictly my above range of materials from 1957 to 1974. They are listed alphabetically according to the presence of keywords as follows:

1. Burgert, Jr EO. (1972/73) Psychological management of children with cancer and of their families. *Paediatrician*, 1: 311-318.
2. Cameron HM. (1973) Oral tumour in Kenya. *Pathologica et Microbiologica*, 39: 187-195.
3. Hill MJ. (1974) Colon cancer: A disease of fibre depletion or of dietary excess? *Digestion*, 11: 289-306.
4. Mackay IR. (1972) Ageing and immunological function in man. *Gerontologia*, 18: 285-304.
5. Sonley MJ. (1972/73) Lymphosarcoma in childhood. *Paediatrician*, 1: 249-260.
6. Truman JT. (1972/73) Neuroblastoma. *Paediatrician*, 1: 231-238.

Discussion

In my present collection of reprints, Switzerland alone took the pride of place from 1971 to 1974. Is this grouping significant? Yes! The clustering position held by the Swiss publisher also held sway in the 100 reprints searched. Thus, out of the total, as many as 63 journals appeared only once. Of the remainders, apart from the highly cited Canadian Journal of Otolaryngology with 5 entries, only the Swiss group appeared 6 times. More interesting still, 3 of them showed that the keywords appeared in their first issue dated 1972/73. In other words, the keyword system of publications arose after decades of neglect. Consequently, I am persuaded that my quantitative approach to searching the beginnings of the keyword system is significant.

Significant on its own was also the invitation which I received from an Editor [2]. It came from the Journal, *Biochemistry & Physiology*, and requested me to contribute a personal Review. I did so recently under the title of "Lymphangiogenesis in Cancer: A Review" [14]. It included 79 references. Interestingly, it highlighted my own paper [9]. In it, I had traced the earliest microscopic deposits formed by cancer cells traveling from the lung to the abdominal lymph nodes. In particular, I wrote regarding the newness of this phenomenon as follows six times:

1. "Newly formed afferent vessels."
2. "New afferents open up."
3. "Newly openly backwardly directed lymphatics."
4. "New retrogradely directed afferent lymphatics."
5. "New afferent lymphatics links."
6. "Probably most often transported backwards by way of newly formed afferent lymph vessels."

Vessels of the afferent lymphatic type were, therefore, studiously mentioned not once but 6 times. Clearly, they stood out. And yet, probably because the keyword system was not in vogue then, attention was not directed to this discovery. Nowadays, it goes by the apposite name of "lymphangiogenesis," i.e., formation of new lymph vessels. Surely, had keyword listing been in place around 1963, this highly regarded phenomenon would have entered the scientific scene around that year instead of appearing from only during recent years [5,15].

Conclusion

Scientometrics involves an innovative approach hinged on "the study of science, communication in science, and science policy" [6]. Here, I measured "clustering" in both my own 48 articles and in 100 wider random series. In this context, the Swiss Publishers, S. KARGER, Basel, have played a positive role. Incidentally, in an invited review, I included the fact that, as far back as 1963, I had mentioned the word, "new," 6 times with regard to my research on the routes provided for cancer cell carriage by lymph vessels. Hence, it is hypothesized that, if keywords had been in vogue by then, the important phenomenon now appositely called "lymphangiogenesis" would have entered the literature earlier on, i.e., in the 1960s rather than since the 2000s. In sum, although keywords were dated back to 1859, they were apparently not relevant in scientific communications until the early 1970s. Instructively, DeBakey and DeBakey had not long ago argued the case for including both keywords and the Abstract! Accordingly, just as John Swales concluded that I am the only active researcher in the RR area, I can confidently add that this helped me to trace the belatedness of the blossoming of the keyword system [1,16]. This ought to be appreciated in scientific communications. Indeed, it should itself prove to be worthy of research from several angles, including when individual publishers began to use it routinely.

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