

INTERNATIONAL VISIBILITY OF RHINOPLASTY RESEARCH

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ABSTRACT

Rhinoplasty represents a widely used surgical approach to correct nasal deformities and imperfections. A scientometric investigation of the world publication output and citations on these problems was carried out in *Web of Science (WoS)*, *MEDLINE*, and *EMBASE* for a 26-year period - from January 1985 till December 2010. Any relevant publications which had been abstracted were retrieved and analyzed. In this narrow field, 4155 publications were abstracted in *MEDLINE (WoK)*, 2286 - in *EMBASE*, and 1980 - in *WoS*. English-language publications amounted to 1922 in *EMBASE* and to 1895 in *WoS*. There were more than 7700 author's names with papers on rhinoplasty abstracted in *MEDLINE (WoK)* and more than 3500 ones - in *WoS*. The most productive authors, institutions and countries as well as the 'core' journals were identified. Bulgaria has become internationally visible with 3 papers abstracted in *WoS*, with two - in *EMBASE*, and with one - in *MEDLINE (WoK)*. The intensity of collaboration between the researchers within the single scientific unit, between different scientific institutions in one and the same city, in different cities of one and the same country, and between collectives from different countries permanently increased. A broader incorporation of Bulgarian scientists into the international scientific communities should be recommended.

Key words: rhinoplasty, scientometrics, data-bases, science internationalization, science institutionalization

INTRODUCTION

Rhinoplasty was applied since the earliest years of ancient cultures in India, Egypt, Greece, and Italy onwards. Until the 19th century, nasal surgery was restricted only to emergent care in cases of acute injuries and reconstructions of nasal parts which were already removed or destructed by various diseases. With the initial esthetic rhinoplasties which were entirely of reconstructive nature a variety of external sections were made use of being followed by different types of skin, soft-tissue, or cartilage resections. During the 70-s and 80-s of the 20th century, some techniques for separate treatment of bone and cartilage components were applied in which the specific surgical tools were used in a different sequence. However, there are numerous recent publications devoted to different postoperative functional and esthetic complications.

International visibility of scientific achievements is a feature of advanced science in a given field such as Bulgarian medical research (8), of Spanish universities (5), or of Brazilian scientific community (4). Several powerful informa-

tion centres in the developed countries produce a lot of secondary information sources, data-bases and information portals in order to warrant the timely dissemination of the new scientific information published primarily worldwide. The scientific community becomes aware not only of the factual full-text or abstracted information but also of the names and addresses of the authors as well as of the titles of the corresponding primary information sources such as journals, conference proceedings, monographs, theses, etc. Recently, science internationalization is intensively studied (3-5,8,9). This includes not only the direct scientific interaction between single researchers and their collectives based on official contracts or within informal teams but also the following components (1):

i) continuous creation of new international scientific societies and associations of national societies, of international scientific journals and of international publishers of scientific literature related to them; ii) publishing of scientific papers, reviews and book reviews in foreign journals and periodicals; iii) translation and publication of monographs and collections by foreign authors; iv) organization of international scientific forums and participation in them of scientists from many countries; v) enrichment of the forms of direct exchange of research staff; vi) intensive dissemination of the newest scientific information through modern information-communication technologies; vii) moderniza-

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tion and automatization of research and university libraries; viii) introduction of electronic journals and monographs, and ix) overcoming the traditional barriers for communication between the scientists from different countries.

During the recent years, there is a dramatic growth of the interest in various aspects of the interdisciplinary issue of rhinoplasty worldwide as well as of the publication output, abstracting and citation activity related to it.

The objective of the present study is to demonstrate some essential scientometric characteristics of the international scientific communications as elements of the internationalization and institutionalization of science in the socially significant topics of rhinoplasty as well as to systematize the information about the leading scientific schools, authors, and journals and to present some opportunities for improvement of the quality, effectiveness and applicability of research into the immediate clinical practice.

MATERIAL AND METHODS

A problem-oriented scientometric investigation was carried out in three data-bases such as *Web of Science (WoS of Web of Knowledge, WoK)*, *MEDLINE* (through *WoK*), and *EMBASE*. Retrospective search was performed in February, 2011 and covered a 26-year period - from January 1985 till December 2010. Any publications relevant to the problems of rhinoplasty which had been abstracted annually and in total in these data-bases were retrieved. The following main bibliometric indicators were dynamically followed up: number, types and languages of abstracted publications (10); number and titles of journals and conference proceedings containing these publications; names and countries of authors; names and countries of scientific institutions of authors; thematic and disciplinary belonging of publications, journals and scientific institutions as well; number of citations received in *WoS*, authors and journals

Table 1. Authors with most-abstracted papers on the topics of rhinoplasty

No	Name of author	Institution	WoS	MEDLINE (WoK)	EMBASE
1.	Rod J. Rohrich	Univ. Texas, Dallas, USA	68	48	42
2.	Bahman Guyuron	Case West. Res. Univ., Cleveland, USA	43	48	35
3.	Jack P. Gunter	Univ. Texas, Dallas, USA	33	21	19
4.	Rollin K. Daniel	Univ. California Irvine, Irvine, USA	30	27	30
5.	Ronald P. Gruber	Stanford Univ., Stanford, USA	33	20	18
6.	Peter A. Adamson	Toronto Gen. Hosp., Toronto, Canada	16	34	25
7.	Mark B. Constantian	Dartmouth Coll. Sch. Med., Dartmouth, USA	26	17	23
8.	Wolfgang Gubisch	Marien Hosp., Stuttgart, Germany	11	37	17
9.	Dean M. Toriumi	Univ. Illinois, Chicago, USA	15	25	24
10.	Thomas Romo, 3rd	Lenox Hill Hosp., New York, USA	7	24	22
11.	Yong J. Jang	Univ. Ulsan, Seoul, South Korea	16	18	17
12.	Russell W. H. Kridel	Univ. Texas, Houston, USA	9	21	17
13.	Gilbert J. N. Trenite	Univ. Amsterdam, Amsterdam, The Netherlands	15	14	14
14.	W. P. Adams, Jr	Univ. Texas, Dallas, USA	20	9	13
15.	H. D. Vuyk	Gooi Noord Hosp., Blaricum, The Netherlands	13	16	12
16.	Daniel G. Becker	Univ. Penn, Philadelphia, USA	8	17	27
17.	Ted A. Cook	Oregon Hlth Sci. Univ., Portland, USA	9	16	15
18.	Hossam M. T. Foda	Alexandria Med. Sch., Alexandria, Egypt	9	13	14
19.	Alexander Berghaus	Univ. München, München, Germany	14	7	9
20.	Sam P. Most	Stanford Univ., Stanford, USA	9	14	7
21.	David W. Kim	Korea Univ., Seoul, South Korea	11	10	12
22.	M. E. Tardy, Jr	Univ. Illinois, Chicago, USA	4	18	10
23.	Armando Bocchieri	S. C. Forlani Hosp., Rome, Italy	9	12	6

with most-cited publications in *WoS* as well as citations to Bulgarian publications in *WoS*. Specific scientometric distributions characterizing the most substantial peculiarities of the structure and dynamics of the international scientific communications on this relatively narrow topic presenting with a rising socio-medical importance were elaborated.

RESULTS AND DISCUSSION

In this narrow field, 4155 publications were abstracted in *MEDLINE (WoK)*, 2286 - in *EMBASE*, and 1980 - in *WoS*. Their number permanently increased: from 24 in 1985 up to 285 - in 2010 in *MEDLINE (WoK)*; from 36 up to 168 - in *EMBASE*, and from 20 up to 191 - in *WoS* (Fig. 1).

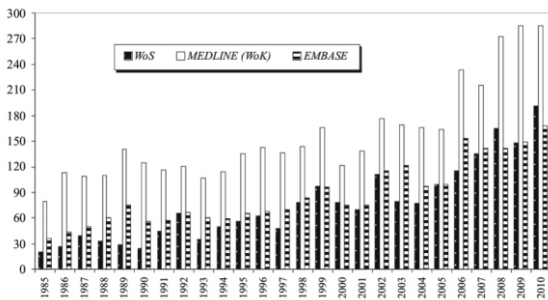


Fig. 1. Annual dynamics of the publications abstracted in three data-bases

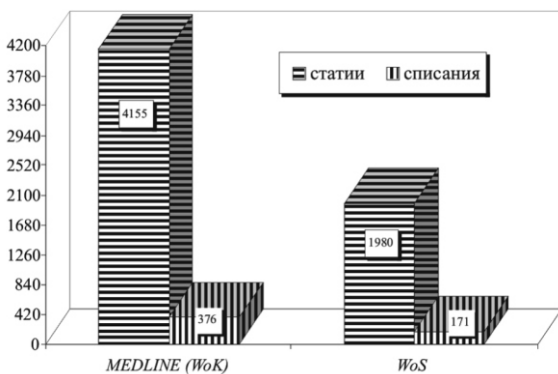


Fig. 2. Number of abstracted papers and of journals containing them in *MEDLINE (WoK)* and *WoS*

Besides in 1985-1989, in *WoS* there were 148 abstracted publications while in 2006-2010 - 754 ones, or by 5,2 times more. The growth of the number of publications abstracted in *EMBASE* during the same period was by 2,8 times while in *MEDLINE (WoK)* - by 2,3 times.

The numbers of abstracted articles and journals containing them in *MEDLINE (WoK)* and *WoS* were compared on Fig. 2. The distribution of the main languages according to the number of publications abstracted in *WoS* and *EMBASE* can be seen on Fig. 3. Along with the dominating English language, there were 19 other languages in *EMBASE* and 5 ones - in *WoS*. There were 1922 Eng-

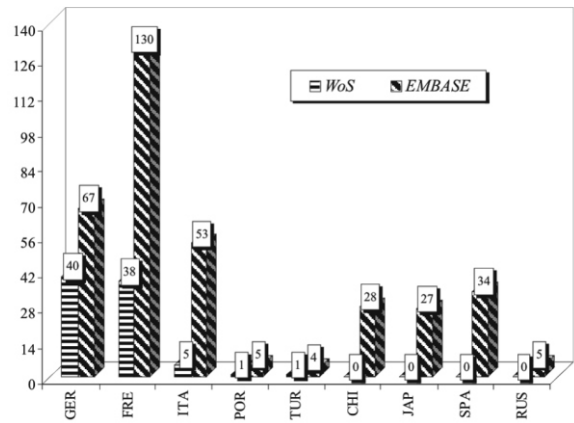


Fig. 3. Distribution of main languages according to the number of publications abstracted in *WoS* and *EMBASE*

lish-language publications (84,08% of all papers) in *EMBASE* and 1895 ones (95,71% of all papers) in *WoS*.

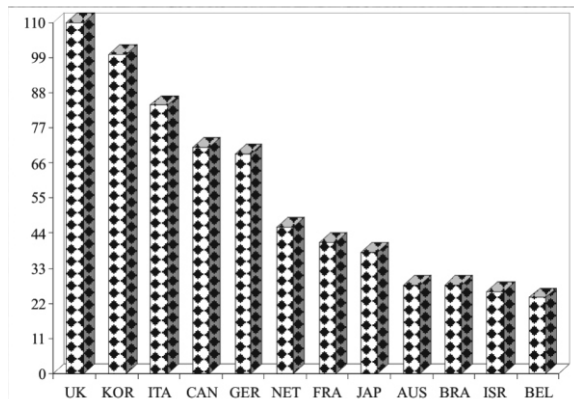


Fig. 4. Distribution of some leading countries according to the number of papers by their authors abstracted in *WoS*

There were more than 7700 author's names with papers on rhinoplasty abstracted in *MEDLINE (WoK)* and more than 3500 ones in *WoS*. The names and number of publications of most eminent scientists abstracted in *WoS*, *MEDLINE (WoK)* and *EMBASE* were displayed on Table 1. The total number of authors' countries in *WoS* was 63. The USA occupied a dominant position with a total of 793 abstracted publications (40,08% of all abstracts). There was a similar finding in any scientometric distributions of contemporary scientific literature. The second place occupied by Turkey stressed to a great extent, however, as this country presented with a total of abstracted publications (9,31% of all abstracts). Some authors from Turkey presented with a considerable amount of abstracts dealing with rhinoplasty during the recent several years, too.

Fig. 4 illustrated the distribution of the rest leading countries according to the number of their authors' publications abstracted in *WoS*. The distribution of the different publication types in *MEDLINE (WoK)* was systematized on Fig. 5. Along with original and review articles, there were several other document types such as case reports (871 publications), comparative studies (212), historical articles (81),

Table 2. „Core” journals on the topics of rhinoplasty

No	Journal title	Country of publication	WoS	MEDLINE (WoK)
1.	<i>Plastic and Reconstructive Surgery</i>	USA	500	693
2.	<i>Aesthetic Plastic Surgery</i>	USA	202	272
3.	<i>Archives of Facial Plastic Surgery</i>	USA	105	215
4.	<i>Annals of Plastic Surgery</i>	USA	114	190
5.	<i>Archives of Otolaryngology - Head & Neck Surgery</i>	USA	82	121
6.	<i>Journal of Craniofacial Surgery</i>	USA	77	107
7.	<i>Laryngoscope</i>	USA	67	104
8.	<i>Facial Plastic Surgery</i>	USA	33	189
9.	<i>Clinics in Plastic Surgery</i>	USA	39	76
10.	<i>Otolaryngologic Clinic of North America</i>	USA	46	63
11.	<i>Laryngorhinootologie</i>	Germany	22	97
12.	<i>Journal of Plastic, Reconstructive and Aesthetic Surgery</i>	The Netherlands	38	71
13.	<i>British Journal of Plastic Surgery</i>	England	26	71
14.	<i>Otolaryngology - Head & Neck Surgery</i>	USA	37	57
15.	<i>Rhinology</i>	The Netherlands	27	65
16.	<i>Annales de Chirurgie Plastique et Esthetique</i>	France	16	73

randomized controlled trials - RCT (71), biographies of scientists (44), validation studies (6), meta-analyses (2), etc. This was a convincing evidence of the significant extent of maturity of this narrow scientific topic achieved during the recent years. During the new century, a great number of scientific forums on this thematic circle such as congresses, conferences, annual meetings, and symposia were held in a series of countries from all over the world. The number of

scientific forums abstracted in WoS significantly stressed, indeed - 178. The Annual Meeting of the Society of Rhinoplasty in Dallas, TX, USA, strongly dominated presenting with 47 abstracted reports. The main descriptors of the publications abstracted in MEDLINE (WoK) were shown on Fig. 6. There was a great variety of terms typical

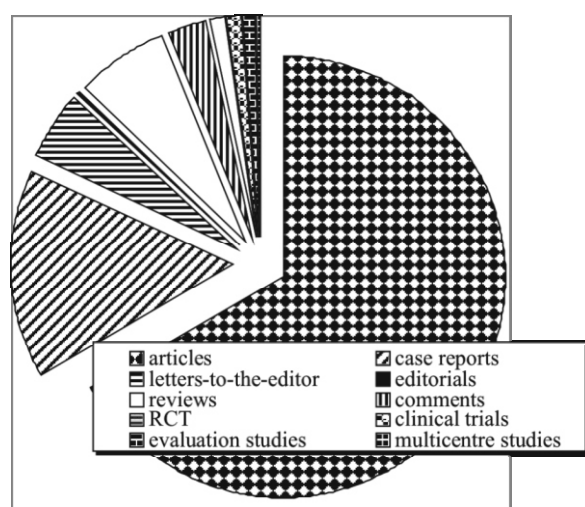


Fig. 5. Distribution of types of publications abstracted in MEDLINE (WoK)

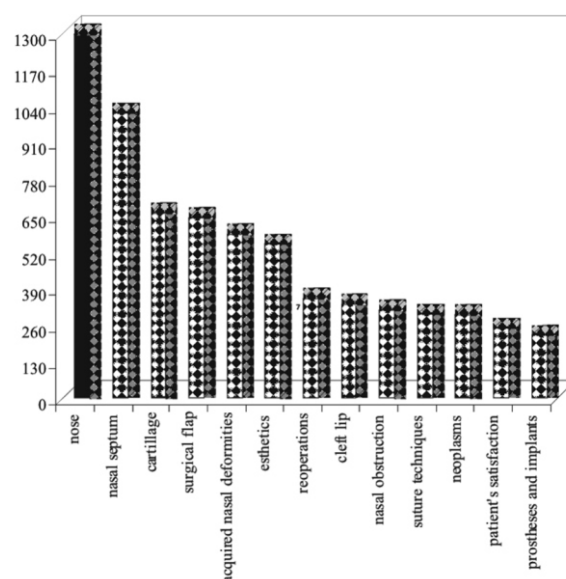


Fig. 6. Distribution of main descriptors of publications abstracted in EMBASE

of the increasing interdisciplinarity of this scientific problem. The main subject categories of publications abstracted in *WoS* and *MEDLINE (WoK)* were similar.

At present, there are numerous scientific institutions worldwide which authors are immediately involved in research on rhinoplasty. The total number of the scientific organizations is imposing - over 1100. USA universities prevail followed by those in Canada, Turkey, the Netherlands, South Korea, etc. The Clinic in Seoul, South Korea specialized in rhinoplasty is of significant interest. The authors who work there have already published 7 papers abstracted in *WoS*. Recently, the number of citations in *WoS* dramatically increases. From 992 in 2007 it reaches up to 1454 in 2009 and even up to 1700 in 2010. There are a total of 10631 received citations until February, 2011, or on the average of 393.74 cites per year and of 5.35 cites per abstracted publication. No self-citations to at least one co-author have been proved in 3042 cites. The sum h-index of this narrow scientific topic is comparatively high - 39. Some 1302 of a total of 1980 abstracted publications have been cited at least one time. One paper has already received 140 cites.

The following universities occupy a dominating position in the field of rhinoplasty during the last 20 years: the Universities of Texas in Dallas and Houston, USA; the University of Toronto in Toronto, Canada; Stanford University, USA; the Universities of California in Irvine, San Francisco, Los Angeles, and Davis, USA; the University of Illinois in Chicago, USA; Ulsan University and Korea University in Seoul, South Korea; Harvard University in Cambridge, USA; Amsterdam University in Amsterdam, the Netherlands, and New York University in New York, USA.

Two authors presenting with the greatest number of abstracted publications, i. e. M. B. Constantin and J. P. Gunter belong with two papers to the group of 20 most-cited papers while one author, R. J. Rohrich, does with one paper. The journal *Plastic and Reconstructive Surgery*, which is the leader in this group, presents with 12 papers while the rest 8 journals present with one paper only each. This journal contains the greatest number of papers abstracted in *WoS* and *MEDLINE (WoK)* (Table 2). Three of the aforementioned 8 journals belong to the 16 journals with the greatest number of papers abstracted in these two data-bases.

Bulgaria has become internationally visible with 3 papers abstracted in *WoS*. They are two papers by P. Nedev (Medical University of Varna) in "*C. R. Acad. Bulg. Sci.*" and in "*European Archives of Oto-Rhino-Laryngology*" and one paper by Yu. Anastasov and H. Shipkov (Medical University of Plovdiv) in "*Journal of Cranio-Maxillofacial Surgery*" which has already been cited 7 times in *WoS* (Appendix). In *EMBASE*, two other papers are abstracted, i. e. by P. Tepavicharova (Medical University of Sofia) and by V. Tsvetkov (Military Medical Academy of Sofia) in the Bulgarian journal "*Hirurgia*". Another paper by H. Shipkov, Yu. Anastasov, K. Dzhabazov, R. Simeonov and R. Simov (Medical University of Plovdiv) has primarily been

published in the Bulgarian journal "*Folia Medica*" and then abstracted *MEDLINE (WoK)*.

There is an increase of the number of the countries of the authors of publications and of the countries publishing the corresponding journals, of the number of typically international journals which are regularly published by several countries such as the USA, United Kingdom, the Netherlands, Germany, etc. The absolute count and relative share of the publications in the foreign journals by the authors from smaller countries as well as by those working in the powerful research centres increase. The rising publication output of Turkish scientists during the recent years strongly stresses, indeed. There is a gradual growth of the intensity of collaboration between the researchers within the single scientific unit, between different scientific institutions in one and the same city, in different cities of one and the same country, and between collectives from different countries. There are already single publications of teams working in a comparatively large amount of scientific organizations, the so-called multicentre studies. We could, therefore, recommend a much broader incorporation of Bulgarian scientists into similar informal scientific communities.

CONCLUSION

Complex scientometric research reveals essential aspects of the dynamic development at the forefront of modern interdisciplinary science. It outlines concrete subfields of the corresponding narrow research topic which seem to be most promising and a true 'hot topic' and, therefore, necessitate specific problem-oriented, intra- and interdisciplinary, interinstitutional and international co-operation. The identification of the leading scientists and their schools in the developed countries could help the effective uniting of the researchers and science policy managers in the smaller countries to the world standards.

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Appendix:

Citations to the aforementioned paper in WoS:

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