

## Korea's Contribution to Radiological Research Included in Science Citation Index Expanded, 1986-2010

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**Objective:** To evaluate scientific papers published by Korean radiologists in the Science Citation Index Expanded (SCIE) radiology journals, between 1986 and 2010.

**Materials and Methods:** The Institute for Scientific Information Web of Knowledge-Web of Science (SCIE) database was searched for all articles published by Korean radiologists, in SCIE radiology journals, between 1986 and 2010. We performed the analysis by typing "Korea" and "radiol" in the address section and selecting the subject area of "Radiology, Nuclear Medicine, and Medical Imaging" with the use of the general search function of the software. Analyzed parameters included the total number of publications, document types, journals, and institutions. In addition, we analyzed where Korea ranks, compared to other countries, in terms of the number of published articles. All these data were analyzed according to five time periods: 1986-1990, 1991-1995, 1996-2000, 2001-2005, and 2006-2010.

**Results:** Overall, 4974 papers were published by Korean radiologists, in 99 different SCIE journals, between 1986 and 2010, of which 4237 (85.2%) were article-type papers. Of the total 115395 articles, worldwide, published in radiology journals, Korea's share was 3.7%, with an upward trend over time ( $p < 0.005$ ). The journal with the highest number of articles was the American Journal of Roentgenology ( $n = 565$ , 13.3%). The institution which produced the highest number of publications was Seoul National University ( $n = 932$ , 22.0%).

**Conclusion:** The number of scientific articles published by Korean radiologists in the SCIE radiology journals has increased significantly between 1986 and 2010. Korea was ranked 4th among countries contributing to radiology research during the last 5 years.

**Index terms:** Citation analysis; Publication; Radiologic research; Korea

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### INTRODUCTION

The number of publications in scientific journals is an important reflection of research activity (1, 2). In recent years, the Korean contribution to the number of publications in international radiology journals has dramatically increased (3, 4). Although several bibliometric studies have reported different countries' contributions to radiology journals (5-8), there has been no analysis of Korea's contribution to radiology research publications. The purpose of this study was to evaluate scientific papers

published by Korean radiologists in the Science Citation Index Expanded (SCIE) radiology journals over the last 25 years, from 1986 to 2010, and to compare Korea's contribution to that of other countries.

## MATERIALS AND METHODS

Our study was a retrospective bibliometric analysis not involving human subjects; it was exempt from Institutional Review Board approval.

The Institute for Scientific Information (ISI) Web of Knowledge<sup>SM</sup>-Web of Science (SCIE)<sup>®</sup>, a database covering more than 5400 journals across more than 150 scientific disciplines, was searched to determine the total number of publications in radiology journals, by Korean radiologists, during a 25-year time period (1986-2010).

We performed an analysis by typing "Korea" and "radiol" into the address section in order to identify authors as Korean radiologists. The term "radiol" was chosen in order to widen our search to authors with a variety of addresses ("Department of Radiology", "Department of Neuroradiology", "Department of Pediatric Radiology", "Department of Radiological Sciences", etc.), as well as to exclude authors from other departments ("Department of Nuclear Medicine", "Department of Radiation Oncology", etc.). Then, all journals related to radiology were selected from the "Radiology, Nuclear Medicine, and Medical Imaging" subject area using the general search function of the software.

We analyzed results using the "analyze" function of the software according to number of publications, document type, journals of publication, and participating institutions. Analysis was divided into five separate 5-year periods

in order to examine the time trend: 1986-1990, 1991-1995, 1996-2000, 2001-2005, and 2006-2010. The journal impact factor of each journal was retrieved from the Science Citation Report on ISI Web of Knowledge<sup>SM</sup>-Journal Citation Reports (JCR)<sup>®</sup>. The mean impact factor value over the 2005-2009 period was calculated for each journal. Document type was classified into 15 discrete types, according to ISI data: articles, proceedings papers, editorial material, reviews, letters, meeting abstracts, etc. In order to measure radiological productivity, only the "articles" (original articles and case reports) type was used to further analyze results; other document types were excluded from the analysis.

We analyzed where Korea ranked, compared to other countries, in terms of the number of published articles. In addition, to compare Korea's contribution to research in radiology with those of other countries, the proportion of contributions by each of the countries was ranked in descending order. Shares of the top-ranking countries were assessed for each period in order to examine the time trend between 1986 and 2010. Articles originally categorized as "from Hong Kong" have been re-categorized as "from China." Articles originating from England, Scotland, Wales, and Northern Ireland were grouped under the United Kingdom heading.

The present study encompasses the entire population of available publications, rather than a representative sample, so only a descriptive research approach is adopted. For trend analyses for each of the top-ranking countries, an ordinary least-squares linear regression was used. Statistical analyses were performed using software (SPSS version 12.0 for Windows; SPSS, Chicago, IL, USA) and a *p* value of < 0.05 was considered statistically significant.

**Table 1. Distribution of Document Types Published by Korean Radiologists in Journals Listed by Science Citation Index Expanded Under Subject "Radiology, Nuclear Medicine and Medical Imaging" between 1986 and 2010**

| Type               | No. of Documents |            |            |             |             |             |
|--------------------|------------------|------------|------------|-------------|-------------|-------------|
|                    | 1986-1990        | 1991-1995  | 1996-2000  | 2001-2005   | 2006-2010   | 1986-2010   |
| Article            | 86 (89.6)        | 252 (84.0) | 588 (86.9) | 1170 (82.4) | 2141 (86.3) | 4237 (85.2) |
| Proceedings paper  | 1 (1.0)          | 8 (2.7)    | 54 (8.0)   | 102 (7.2)   | 79 (3.2)    | 244 (4.9)   |
| Editorial material | 0 (0)            | 0 (0)      | 5 (0.7)    | 69 (4.9)    | 118 (4.8)   | 192 (3.9)   |
| Review             | 1 (1.0)          | 5 (1.7)    | 13 (1.9)   | 21 (1.5)    | 54 (2.2)    | 94 (1.9)    |
| Letter             | 3 (3.1)          | 4 (1.3)    | 11 (1.6)   | 19 (1.3)    | 42 (1.7)    | 79 (1.6)    |
| Meeting abstract   | 2 (2.1)          | 1 (0.3)    | 6 (0.9)    | 35 (2.5)    | 33 (1.3)    | 77 (1.5)    |
| Others*            | 3 (3.1)          | 30 (10.0)  | 0 (0)      | 4 (0.3)     | 14 (0.6)    | 51 (1.0)    |
| Total              | 96 (100)         | 300 (100)  | 677 (100)  | 1420 (100)  | 2481 (100)  | 4974 (100)  |

**Note.**— Values in parentheses are percentages. \*Include Bibliography, Biographical-Item, Book review, Correction, Hardware review, News Item, Note, Reprint and Software review

**Table 2. Distribution of Journals of Articles Published by Korean Radiologists in Journals Listed by Science Citation Index Expanded Under Subject "Radiology, Nuclear Medicine and Medical Imaging" between 1986 and 2010**

| Journal (Mean Impact Factor*)                          | No. of Articles |           |            |            |            |            |
|--|-----------------|-----------|------------|------------|------------|------------|
|  | 1986-1990       | 1991-1995 | 1996-2000  | 2001-2005  | 2006-2010  | 1986-2010  |
| American Journal of Roentgenology (2.538)              | 16 (18.6)       | 36 (14.3) | 92 (15.6)  | 139 (11.9) | 282 (13.1) | 565 (13.3) |
| Korean Journal of Radiology (1.325)                    |                 |           |            | 122 (10.4) | 243 (11.3) | 365 (8.6)  |
| Journal of Computer Assisted Tomography (1.448)        | 7 (8.1)         | 37 (14.7) | 80 (13.6)  | 95 (8.1)   | 132 (6.2)  | 351 (8.3)  |
| Radiology (5.705)                                      | 15 (17.4)       | 42 (16.7) | 75 (12.8)  | 91 (7.8)   | 113 (5.3)  | 336 (7.9)  |
| American Journal of Neuroradiology (2.637)             | 4 (4.7)         | 11 (4.4)  | 33 (5.6)   | 67 (5.7)   | 95 (4.4)   | 210 (5.0)  |
| Abdominal Imaging (1.372)                              |                 | 18 (7.1)  | 50 (8.5)   | 68 (5.8)   | 65 (3.0)   | 201 (4.7)  |
| Journal of Ultrasound in Medicine (1.140)              | 2 (2.3)         | 6 (2.4)   | 21 (3.6)   | 52 (4.4)   | 106 (5.0)  | 187 (4.4)  |
| Journal of Vascular and Intervention Radiology (2.260) |                 | 3 (1.2)   | 17 (2.9)   | 44 (3.8)   | 94 (4.4)   | 158 (3.7)  |
| European Radiology (3.127)                             |                 |           | 7 (1.2)    | 37 (3.2)   | 96 (4.5)   | 140 (3.3)  |
| Acta Radiologica (1.050)                               |                 | 11 (4.4)  | 7 (1.2)    | 24 (2.1)   | 75 (3.5)   | 117 (2.8)  |
| Investigative Radiology (4.189)                        | 3 (3.5)         | 13 (5.2)  | 17 (2.9)   | 30 (2.6)   | 33 (1.5)   | 96 (2.3)   |
| Pediatric Radiology (1.051)                            |                 | 8 (3.2)   | 14 (2.4)   | 27 (2.3)   | 47 (2.2)   | 96 (2.3)   |
| Clinical Radiology (1.632)                             |                 | 6 (2.4)   | 11 (1.9)   | 11 (0.9)   | 59 (2.8)   | 92 (2.2)   |
| Clinical Imaging (0.743)                               | 2 (2.3)         | 6 (2.4)   | 7 (1.2)    | 39 (3.3)   | 36 (1.7)   | 90 (2.1)   |
| Cardiovascular and Interventional Radiology (1.395)    | 1 (1.2)         | 6 (2.4)   | 9 (1.5)    | 34 (2.9)   | 31 (1.4)   | 81 (1.9)   |
| Skeletal Radiology (1.189)                             |                 | 1 (0.3)   | 15 (2.6)   | 16 (1.4)   | 42 (2.0)   | 74 (1.7)   |
| European Journal of Radiology (2.024)                  |                 |           | 2 (0.3)    | 15 (1.3)   | 56 (2.6)   | 73 (1.7)   |
| British Journal of Radiology (1.783)                   | 1 (1.2)         | 1 (0.4)   | 8 (1.4)    | 21 (1.8)   | 39 (1.8)   | 70 (1.7)   |
| Journal of Magnetic Resonance Imaging (2.549)          |                 |           | 1 (0.2)    | 11 (0.9)   | 57 (2.7)   | 69 (1.6)   |
| Journal of Clinical Ultrasound (0.719)                 |                 | 1 (0.4)   | 5 (0.9)    | 27 (2.3)   | 32 (1.5)   | 65 (1.5)   |
| Others   | 35 (40.7)       | 46 (18.3) | 117 (19.9) | 200 (17.1) | 408 (19.1) | 801 (18.9) |
| Total  | 86 (100)        | 252 (100) | 588 (100)  | 1170 (100) | 2141 (100) | 4237 (100) |

**Note.**— Values in parentheses are percentages. Data include only "article" type. \*Mean impact factor over 2005-2009 period.

## RESULTS

Overall, 4974 papers were published by Korean radiologists in 99 different radiology journals indexed by the SCIE, between January 1986 and December 2010. Among them, 4237 (85.2%) were article types, followed by proceedings papers (n = 244, 4.9%), editorial material (n = 192, 3.9%), and reviews (n = 94, 1.9%) (Table 1).

Table 2 shows the distribution of articles and the mean impact factor of the published journals. The top 5 journals publishing articles from Korean radiologists were: American Journal of Roentgenology (n = 565, 13.3%), Korean Journal of Radiology (n = 365, 8.6%), Journal of Computer Assisted

Tomography (n = 351, 8.3%), Radiology (n = 336, 7.9%), and American Journal of Neuroradiology (n = 210, 5.0%).

Seoul National University (22.0%) accounted for the highest percentages of all the publications in Korea, followed by Ulsan University (16.8%), Sungkyunkwan University (15.1%), Yonsei University (13.6%), and Catholic University (7.6%) (Table 3).

Table 4 shows the details of research output from the top 20 countries. In total, 115395 articles were published by worldwide radiologists in radiology (or related) SCIE journals from 1986 to 2010. Among these, Korea's contribution was 3.7% (4237 articles) and ranked 6th in the world. The United States shared the highest proportion of radiology

research, accounting for 56035 (48.6%) articles, followed by Germany (9.8%), Japan (9.3%), United Kingdom (5.4%), and France (3.8%).

The number of worldwide radiology publications increased steadily in over the observed period. During 1986-1990, 18330 articles were published, while during 2006-2010, the

**Table 3. Distribution by Institutions of Articles Published by Korean Radiologists in Journals Listed by Science Citation Index Expanded Under Subject "Radiology, Nuclear Medicine and Medical Imaging" between 1986 and 2010**

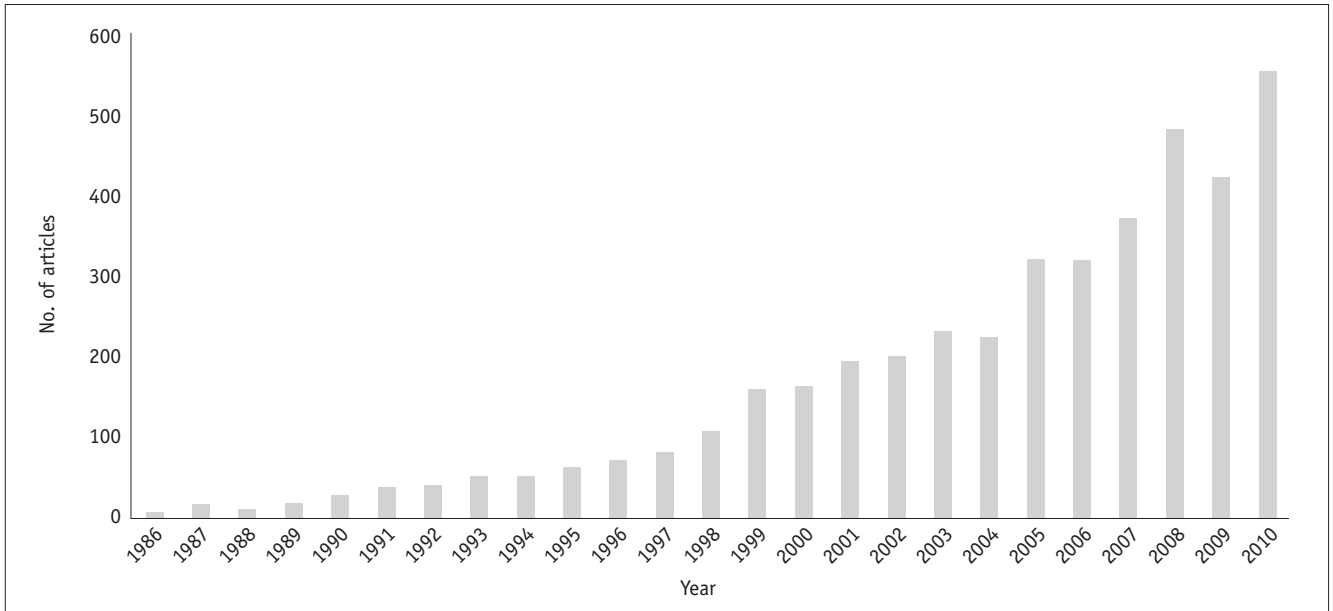
| Institutions                     | No. of Articles |            |            |            |            |             |
|----------------------------------|-----------------|------------|------------|------------|------------|-------------|
|                                  | 1986-1990       | 1991-1995  | 1996-2000  | 2001-2005  | 2006-2010  | 1986-2010   |
| Seoul National University        | 35 (40.7)       | 79 (31.3)  | 137 (23.3) | 256 (21.9) | 425 (19.9) | 932 (22.0)  |
| University of Ulsan              | 3 (3.5)         | 29 (11.5)  | 89 (15.1)  | 234 (20.0) | 356 (16.7) | 711 (16.8)  |
| Sungkyunkwan University          |                 |            | 73 (12.4)  | 196 (16.8) | 369 (17.2) | 638 (15.1)  |
| Yonsei University                | 5 (5.8)         | 16 (6.3)   | 82 (13.9)  | 154 (13.2) | 321 (15.0) | 578 (13.6)  |
| The Catholic University of Korea | 1 (1.2)         | 26 (10.3)  | 64 (10.9)  | 87 (7.4)   | 142 (6.6)  | 320 (7.6)   |
| Korea University                 |                 | 7 (2.8)    | 11 (1.9)   | 41 (3.5)   | 97 (4.5)   | 156 (3.7)   |
| Kyung Hee University             | 3 (3.5)         |            | 11 (1.9)   | 16 (1.4)   | 87 (4.1)   | 117 (2.8)   |
| Hallym University                |                 | 4 (1.6)    | 14 (2.4)   | 19 (1.6)   | 70 (3.3)   | 107 (2.5)   |
| Ajou University                  |                 | 1 (0.4)    | 16 (2.7)   | 16 (1.4)   | 52 (2.4)   | 85 (2.0)    |
| Others                           | 58 (67.4)       | 146 (57.9) | 149 (25.3) | 298 (25.5) | 439 (20.4) | 1090 (25.7) |

**Note.**— Values in parentheses are percentages. Data include only "article" type. Data do not sum up to 100% because of articles arising from collaboration involving more than one institution.

**Table 4. Distribution by 20 Top-Ranking Countries of Items in Articles Published in Journals Listed by Science Citation Index Expanded Under Subject "Radiology, Nuclear Medicine and Medical Imaging" between 1986 and 2010**

| Country           | No. of Articles |              |              |              |              |              |
|-------------------|-----------------|--------------|--------------|--------------|--------------|--------------|
|                   | 1986-1990       | 1991-1995    | 1996-2000    | 2001-2005    | 2006-2010    | 1986-2010    |
| United States ↓   | 11202 (61.1)    | 10232 (56.3) | 11342 (47.5) | 10420 (42.5) | 12839 (42.0) | 56035 (48.6) |
| Germany ↑         | 337 (1.8)       | 1422 (7.8)   | 2562 (10.7)  | 3186 (13.0)  | 3767 (12.3)  | 11274 (9.8)  |
| Japan             | 872 (4.8)       | 1339 (7.4)   | 2599 (10.9)  | 2779 (11.3)  | 3155 (10.3)  | 10744 (9.3)  |
| United Kingdom*   | 1011 (5.5)      | 1157 (6.4)   | 1382 (5.8)   | 1258 (5.1)   | 1479 (4.8)   | 6287 (5.4)   |
| France            | 506 (2.8)       | 684 (3.8)    | 983 (4.1)    | 1030 (4.2)   | 1126 (3.7)   | 4329 (3.8)   |
| South Korea ↑     | 86 (0.5)        | 252 (1.4)    | 588 (2.5)    | 1170 (4.8)   | 2141 (7.0)   | 4237 (3.7)   |
| Canada            | 849 (4.7)       | 823 (4.5)    | 722 (3.0)    | 746 (3.0)    | 1061 (3.5)   | 4201 (3.6)   |
| Italy ↑           | 249 (1.4)       | 335 (1.8)    | 692 (2.9)    | 770 (3.1)    | 1487 (4.9)   | 3533 (3.1)   |
| The Netherlands ↑ | 312 (1.8)       | 353 (1.9)    | 637 (2.7)    | 782 (3.2)    | 1332 (4.4)   | 3416 (3.0)   |
| Turkey ↑          | 15 (0.1)        | 90 (0.5)     | 431 (1.8)    | 981 (4.0)    | 1064 (3.5)   | 2581 (2.2)   |
| Switzerland ↑     | 139 (0.8)       | 177 (1.0)    | 422 (1.8)    | 640 (2.6)    | 853 (2.8)    | 2231 (1.9)   |
| Austria           | 233 (1.3)       | 235 (1.3)    | 445 (1.9)    | 492 (2.0)    | 551 (1.8)    | 1956 (1.7)   |
| Belgium ↑         | 213 (1.2)       | 221 (1.2)    | 391 (1.6)    | 486 (2.0)    | 642 (2.1)    | 1953 (1.7)   |
| Sweden ↓          | 404 (2.2)       | 336 (1.9)    | 425 (1.8)    | 364 (1.5)    | 415 (1.4)    | 1944 (1.7)   |
| China† ↑          | 56 (0.3)        | 87 (0.5)     | 273 (1.1)    | 436 (1.8)    | 997 (3.3)    | 1849 (1.6)   |
| Spain             | 94 (0.5)        | 149 (0.8)    | 355 (1.5)    | 335 (1.4)    | 456 (1.5)    | 1389 (1.2)   |
| Taiwan ↑          | 29 (0.2)        | 91 (0.5)     | 238 (1.0)    | 446 (1.8)    | 532 (1.7)    | 1336 (1.2)   |
| Greece ↑          | 30 (0.2)        | 53 (0.3)     | 147 (0.6)    | 287 (1.2)    | 339 (1.1)    | 856 (0.7)    |
| Australia         | 104 (0.6)       | 125 (0.7)    | 127 (0.5)    | 136 (0.6)    | 292 (1.0)    | 784 (0.7)    |
| Brazil ↑          | 12 (0.1)        | 11 (0.1)     | 62 (0.3)     | 130 (0.5)    | 250 (0.8)    | 465 (0.4)    |

**Note.**— Values in parentheses are percentages. Ranking based on total number of articles published during 1986-2010. Data do not total 100% because of shares of other countries and international collaboration. \*Includes articles originating from England, Scotland, Wales, and Northern Ireland, †Includes articles originating from Hong Kong. ↑ Share of articles went up significantly over time. ↓ Share of articles went down significantly over time. Data include only "article" type.



**Fig. 1. Number of articles published by Korean radiologists in journals listed by Science Citation Index Expanded under heading "Radiology, Nuclear Medicine and Medical Imaging" between 1986 and 2010.**

cumulative number of articles was 30536. In the time trend analysis for each country, the share of articles by Germany, South Korea, Italy, The Netherlands, Turkey, Switzerland, Belgium, China, Taiwan, Greece, and Brazil increased significantly. On the other hand, the United States and Sweden showed a significantly negative trend (Table 4). The percentage of articles originating from Korea showed a rapid increase, rising from 0.5% during 1986-1990 to 7.0% during 2006-2010 (Fig. 1). When only the period between 2006 and 2010 was taken into consideration, Korea was the nation with the 4th leading production.

## DISCUSSION

The assessment of research output has developed as an important issue for the scientific research community, and bibliometric studies are essential tools in the analysis of research performed in different countries (5, 6). The number of scientific papers from Korea, published in international medical journals, has steadily increased after the 1980s (9-11). The proportion of citations in the clinical medicine field has increased from 11.3% (of the total articles from Korea published in SCI-indexed journals) in 1981 to 17.0% in 2003 (9). Radiology is one of the most productive specialties in Korea; the share of articles in radiology was 3.6% (of the world total of articles published in SCI-indexed journals in this field) in 2005-2009 and ranked 3rd, following "integrative and complementary medicine" (6.1%)

and "pharmacology and pharmacy" (3.7%) (9, 10).

The United States remains the leader in productivity of medical research, and this includes their contribution to radiology. However, its share of research articles in the field of radiology decreased from 61.1% between 1986 and 1990 to 42.0% between 2006 and 2010, although the absolute number of articles has slightly increased. However, the publication growth pattern was exponential in Korea, in terms of both absolute and relative numbers.

This study suggests that radiology research output is increasing worldwide. There are several possible reasons for this phenomenon. First, the most important consideration is that absolute number of citations in all scientific fields has been rising in recent years. Such trends might indicate an increasing number of researchers in the world, as well as a continually growing need for scientists to publish. Second, there have been an increasing number of international radiology journals. The number of journals indexed in SCIE, in the "Radiology, Nuclear Medicine, and Medical Imaging" subject, was 114 in May 2011 (<http://scientific.thomsonreuters.com/cgi-bin/jrnlst/jlresults.cgi?PC=D&SC=VY>). The proliferation of radiology journals might cause an increase in the number of researchers in this specialty. Third, one could hypothesize that radiology itself has been growing as a discipline, increasing its visibility within the medical community. The rapid advance of medical imaging technology such as CT, MR, and molecular imaging can influence the increase in publications in the

field of radiology.

In addition, there was a clear trend toward “globalization” in Korean radiologic research. A major reason for the globalization in Korea is a changing research environment: doctors working in clinical medicine have additional responsibilities toward research. When a manuscript is published in an international journal, the researchers are likely to receive more academic credit than if the same manuscript were published in a domestic journal. Administrators at medical schools use international publications as an objective measure in order to rank faculty members for promotion and salary; this phenomenon echoes behavior in other countries.

In our opinion, however, the main driving force leading to Korea’s increased publication in the field of radiology appears to be the extensive investment in radiology resources and technology. Today, there are 41 medical schools and 84 university-affiliated hospitals in Korea; these constitute the core of increased academic productivity and play a role in the increased number of publications in the field of radiology. Furthermore, rapid adaptation to new imaging technology, systematic training of radiology residents and fellows, and infrastructures necessary to generating high-quality clinical research may explain the growth of Korea’s contribution to radiologic research. Finally, The Korean Society of Radiology has constantly been trying a number of different approaches to motivate academic staff with the aim being to improve their research performance, including research awards, scholarships, and funds offered by the radiological society. The authors hope that the increasing rate of international publications in the field of radiology will further encourage Korean investigators in other fields to participate in medical research.

The present study indicates that the top 5 medical institutions which published the most articles were responsible for 81.1% of all articles from Korea (Table 3). These large-scale institutions may be leading because of a large number of subspecialists, academic faculties, consultants, trainees, and substantial research funds. A study published in 2001 by Ozsunar et al. (12) found that 16.4% of all articles published in Radiology and the American Journal of Roentgenology involved new, advanced technology. Because new radiologic technology is expensive to acquire and maintain, investigators at financially strong institutions have more opportunities to use state-of-the-art imaging equipment and thus increase their chances of publication.

It is interesting to note that the American Journal of Roentgenology accounted for the greatest number ( $n = 565$ , 13.3%) of articles published by Korean radiologists, over the study period (Table 2). This finding is a desirable result because it may reflect the high quality and academic level of the articles. The second journal in radiology research productivity was the Korean Journal of Radiology, despite being only recently (since 2001) included in SCIE. The Korean Journal of Radiology is the official English-language journal of the Korean Society of Radiology; it began as a trimonthly journal (published four times a year) but has been published bimonthly (six times a year) since 2007. Although the majority of articles published in this journal are written by Korean radiologists, the number of articles from other countries has been continuously increasing. Nevertheless, the increase in publications originating from Korea, between 2001 and 2010, may be attributed in part to the increased number of publications in the Korean Journal of Radiology.

There are several limitations in the bibliometric data in this study. First, some studies were collaborative efforts conducted by mixed teams of domestic or international researchers. These articles may have inadvertently been accounted for by more than one institution or country, as the first author’s or corresponding author’s affiliation to the article was not included in the ISI Web of Knowledge database. Second, some articles written by radiologists might have been published in non-radiologic journals in order to receive high impact factors. Inclusion only of articles published in radiology and medical imaging journals may lead to an underestimation of radiological scientific production.

In conclusion, the number of scientific articles published by Korean radiologists in radiology SCIE journals has increased significantly over the past 25 years. Korea was ranked 4th among countries contributing to radiology research during the last 5 years.

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