Clinical and Experimental Vaccine Research’s promotion to internationally competitive journal evidenced by journal metrics

Clinical and Experimental Vaccine Research has been an official journal of the Korean Vaccine Society. Five years passed since its launch in 2012; therefore, it is a time to check the present situation in the international network of journals. To evaluate the journal, there is a variety of tools; however, journal metrics is one of the most frequently used ones because it provides the quantitative data on the journal’s reputation and even quality. Of course, for the journal evaluation, article’s quality itself is the most important and valuable one. Also the data accompanied by the article should be seized for its usefulness [1]. As for article content and data in the journal, it can be analyzed by vaccine researchers in the world. Before that, I would like to provide the quantitative data based on journal metrics to help them to grasp the merit of the journal.

This editorial aims at providing data of a variety of journal metrics to grasp the journal’s position in the international journal network. Specifically, follows were analyzed: number of citable and noncitable articles, number of countries of authors; proportion of funded articles out of research articles; distribution of editorial member by country; citing authors’ countries; source title of citing articles; total citation; impact factor; and, Hirsch index. It is hypothesized that the journal was promoted to get the reputation of the international brand based on the journal metrics.

It is the cross-sectional descriptive study. Data are drawn from the journal’s biography and the Web of Science Core Collection database (cited April 26, 2017). Descriptive statistics were applied. For impact factor, following formula were used [2]:

\[
\text{Impact factor of certain year} = \frac{\text{Number of citation of journal article published for recent two years by Web of Science Core Collection journals}}{\text{Number of citable articles published for recent two years}}
\]

Hirsch index is defined as “the number of papers with citation number ≥ h and it has index h if h of its Np papers have at least h citations each and the other (Np−h) papers have ≤ h citations each” [3]. Although it is suggested for the individual researcher’s productivity and competency, it is now used also for the journal’s competency. For Hirsch index, frequently cited articles were sorted according to citation frequency and its publication type was classified.

Results were as follows: number of citable and noncitable articles from 2012 to the first issue of 2017 were 110 and 14, respectively (Fig. 1). There were 45 review articles, eight special articles, 53 original articles, four brief reports, nine editorials, and five guidelines. Number of countries of authors was 14 (Fig. 2). Two articles provided no author’s country. Korea (97), Iran (10), and United States (4) were three top ranking coun-
tries. Out of 53 original articles, 39 articles (73.6%) were funded ones (Fig. 3). Distribution of editorial board members by country was presented in Fig. 4. There were 23 Korean members, four Americans, two Swedish, each one from eight countries. Total cites to the journal were presented in Fig. 5. There was no citation in 2012; however, it soared to 215 in 2016. Although number of citable articles was 110, it had been cited 486 times. Impact factor could be calculated as 1.355 in 2014, 2.652 in 2015, and 3.286 in 2016. Citing authors were from 71 countries (Fig. 6): United States (135), China (90), and Korea (76) were three top ranking countries. Number of source title of citing articles was 248. Out of them, top six titles were Vaccine (40), PLoS One (24), Human Vaccines Immunotherapeutics (18), Expert Review of Vaccine (13), Veterinary Microbiology (11), and Clinical and Experimental Vaccine Research (11). Table 1 showed the most frequently cited articles and their publication type. From this table Hirsch index can be counted as 13. Raw data for impact factor calculation, citing authors’ countries, and citing journal titles used for this editorial are deposited to Harvard Dataverse available from: https://doi.org/10.7910/DVN/IVSC7S.

Above results told us that this journal already reached to internationally competitive status based on journal metrics. Total cites of year 2016 (215) and impact factor of year 2016 (3.347) was a tremendous competency of the journal although number of the citable articles was 110 (Fig. 5). Authors from
Table 1. Highly cited articles of *Clinical and Experimental Vaccine Research* from Web of Science Core Collection from 2012 to April 2017

| No. | Year | Vol. | Page | Title                                                                 | Publication type | Times cited |
|-----|------|------|------|----------------------------------------------------------------------|------------------|-------------|
| 1   | 2014 | 3    | 58   | Zoonotic encephalitides caused by arboviruses: transmission and epidemiology of alphaviruses and flaviviruses | Review           | 33          |
| 2   | 2012 | 1    | 50   | Mucosal vaccine adjuvants update                                       | Review           | 30          |
| 3   | 2014 | 3    | 12   | New vaccines against influenza virus                                   | Review           | 25          |
| 4   | 2015 | 4    | 166  | Porcine epidemic diarrhea: a review of current epidemiology and available vaccines | Review           | 24          |
| 5   | 2013 | 2    | 26   | H9N2 avian influenza virus in Korea: evolution and vaccination         | Review           | 20          |
| 6   | 2014 | 3    | 42   | Microneedle patches for vaccine delivery                               | Review           | 20          |
| 7   | 2014 | 3    | 155  | Host immune responses to mycobacterial antigens and their implications for the development of a vaccine to control tuberculosis | Review           | 18          |
| 8   | 2013 | 2    | 8    | Requirements for improved vaccines against foot-and-mouth disease epidemics | Review           | 15          |
| 9   | 2013 | 2    | 97   | Viral vectors for vaccine applications                                | Review           | 14          |
| 10  | 2015 | 4    | 1    | Improvement of DNA vaccination by adjuvants and sophisticated delivery devices: vaccine-platforms for the battle against infectious diseases | Special article  | 14          |
| 11  | 2014 | 3    | 50   | Vaccine allergies                                                      | Review           | 13          |
| 12  | 2014 | 3    | 117  | Evolutionary dynamics of highly pathogenic avian influenza A/H5N1 HA clades and vaccine implementation in Vietnam | Special article  | 13          |
| 13  | 2014 | 3    | 140  | Zoonotic infections with avian influenza A viruses and vaccine preparedness: a game of “mix and match” | Review           | 13          |
| 14  | 2014 | 3    | 168  | Current status of human papillomavirus vaccines                       | Review           | 11          |
| 15  | 2014 | 3    | 29   | Hepatitis E virus infections in humans and animals                    | Review           | 11          |

14 countries and editorial board members from eight countries were another evidence of the internationality of the journal (Figs. 2, 4). High proportion of funded article (73.6%) also provided the evidence of high quality of the original articles which were already reviewed by funding agencies (Fig. 3). Citing authors from 71 countries means that the journal had been widely used all over the world and it contained essential data for vaccine researchers in many countries (Fig. 6). Out of eight highly citing journals, two were general scientific journals, *PLoS One* and *Scientific Report*; meanwhile, other five journals besides of this journal were vaccine-related journals (Fig. 7). Therefore, it can be said that this journal’s scope can be categorized as vaccine. Number of self-citation was 11 which represent 2.3% of total cites. It is a reasonably low value.
Hirsch index, 13 is outstanding performance. In other medical journals from Korea within 5 years of launching English-language journals, it is difficult to mark this value: *Intestinal Research*, eight for 3 years with 136 citable articles [3]; *Journal of Orthopedic Surgery*, 13 with 378 citable articles for 7 years [5]; *Journal of Gastric Cancer*, 12 with 199 citable articles for 5 years [6]; *Neurointervention*, seven with 72 citable articles for 5 years [7]; *Journal of Educational Evaluation for Health Professions*, five with 141 citable articles for 10 years [8]; *Annals of Rehabilitation Medicine*, nine with 546 citable articles for 10 years [9]; and *Clinical Endoscopy*, six with 318 citable articles for 4 years [10]. Publication type of most frequently cited articles was review article. Publication types of frequently cited articles varied by journal. Usually review articles received more citation, in some journals, original articles received more citation [7]. It depends on the editorial policy of recruiting review articles. Editor-in-Chief of the journal, Dr. Chong-Woo Bae has maintained a policy to accept the high quality review articles in vaccine research. This policy was successful from the point of citation.

What may be a basis of this kind of marvelous promotion based on journal metrics? First, we can deduce that there was wear and tear of Editor-in-Chief and editorial board members. Second, the publisher, the Korean Vaccine Society’s full support of journal publication was an essential factor to publish it. Its open access policy without author-side submission fee or article processing charge is not possible without publisher’s financial support. Third, the inclusion of free full text database such as PubMed Central in April 18, 2013 and being indexed in PubMed was milestone to be exposed to world researchers and physicians. Although it is an open access journal, the exposure through international database contributes to the increased citation [11].

What should be added to the journal? It already adopted CrossMark (Check for updates) and FundRef (Funder registry) services provided by CrossRef [12]. Furthermore, text and data mining service is better to be adopted [13]. It has been indexed to Web of Science Core Collection as Emerging Sources Citation Index journal since 2015. To be listed as open access journal in this database, it should be registered to Directory of Open Access Journals (DOAJ) [14]. Without registration, journals usually cannot be classified as open access journal. Although there are 199 open access medical journals. In Korea according to a Creative Commons license, 17 journals are listed in DOAJ up to April 2017 [15]. During the revision process of this editorial, the message of inclusion of this journal to SCOPUS arrived from the Content Selection & Advisory Board in May 19, 2017. It is one of the journal’s achievements during its promotion process to be top-notch journal.

I believe that this journal will become one of the top-notch journals soon in the vaccine research field based on the journal metrics data, publisher’s stability, and editors’ devotion to the journal. Also, previous hypothesis of the journal’s promotion to international brand can be accepted.

**ORCID**

Sun Huh  http://orcid.org/0000-0002-8559-8640

**References**

1. Yla-Herttuala S. From the impact factor to DORA and the scientific content of articles. Mol Ther 2015;23:609.
2. Jeong GH, Huh S. The great rise of Intestinal Research as an international journal 3 years after its language change to English as evidenced by journal metrics. Intest Res 2017; 15:1-4.
3. Hirsch JE. An index to quantify an individual’s scientific research output. Proc Natl Acad Sci U S A 2005;102:16569-72.
4. Huh S. Promotion of the Journal of Exercise Rehabilitation to the international level based on journal metrics. J Exerc Rehabil 2016;12:510-4.
5. Huh S. Clinics in Orthopedic Surgery’s evolution into an international journal based on journal metrics. Clin Orthop Surg 2016;8:127-32.

6. Huh S. Journal of Gastric Cancer’s promotion to international journal from the perspective of biliometric analysis. J Gastric Cancer 2016;16:8-13.

7. Huh S. Promotion of Neurointervention to international journal based on journal metrics. Neurointervention 2016;11:5-9.

8. Huh S. How much is Journal of Educational Evaluation for Health Professions promoted based on journal metrics? J Educ Eval Health Prof 2015;12:57.

9. Huh S. The elevation of Annals of Rehabilitation Medicine to the status of an international journal after adopting an English-only policy. Ann Rehabil Med 2015;39:661-6.

10. Huh S. Evidence of the internationalization of Clinical Endoscopy based on journal metrics. Clin Endosc 2015;48:317-21.

11. Jeong GH, Huh S. Increase in frequency of citation by SCIE journals of non-Medline journals after listing in an open access full-text database. Sci Ed 2014;1:24-6.

12. Lammey R. How to apply CrossMark and FundRef via CrossRef extensible markup language. Sci Ed 2014;1:84-90.

13. Lammey R. CrossRef text and data mining services. Sci Ed 2015;2:22-7.

14. Bi X. Quality open access publishing and registration to Directory of Open Access Journals. Sci Ed 2017;4:3-11.

15. Jeong GH, Huh S. Status of digital standards in Korean medical journals in 2016. Sci Ed 2016;3:100-4.