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Authorship에 대한 분석

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Publication is an important academic process. Authorship problems have attracted increased attention around the western world during past three to four decades. Undeserved or unrightful authorship is probably most important and serious problem (1). Authorship must bring with it responsibility as well as reward, considering the original Latin word "auctor" and the etymological term, "authority" (2) Thus, authorship in biomedical journals establishes accountability, responsibility, and credit (3). In the medical research community, however, misconduct relating to the assignment of authorship has been reported to be increasing and most commonly appears as "honorary or guest" authors who do not meet authorship criteria (4, 5). Concerning multi-authored medical papers published today, several factors seemed to be responsible for author inflation, such as the increased numbers of multicenter trials or the complexity of research. Other reasons motivating authors to add as many co-authors as possible have been suggested; for example, honorary or guest authorship due to the need to please someone such as the head of the group or the person who acquired funding for the study by including him/her even if that person did not substantially contribute to the research. Another example is swap authorship by listing his/her name in their own article by barter (3, 6, 7).

In 1985, the International Committee of Medical Journal Editors (ICMJE) established the criteria for authorship and recently modified them during its May, 2000 meeting held in Copenhagen. The criteria for authorship of the ICMJE state that

"All persons designated as authors should qualify for authorship, and all those who qualify should be listed. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content. One or more authors should take responsibility for the integrity of the work as a whole, from inception to published article.

Authorship credit should be based only on 1) substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; 2) drafting the article or revising it critically for important intellectual

content; and 3) final approval of the version to be published. Conditions 1, 2, and 3 must all be met. Acquisition of funding, the collection of data, or general supervision of the research group, by themselves, do not justify authorship.

Authors should provide a description of what each contributed, and editors should publish that information. All others who contributed to the work who are not authors should be named in the Acknowledgments, and what they did should be described.

Increasingly, authorship of multicenter trials is attributed to a group. All members of the group who are named as authors should fully meet the above criteria for authorship. Group members who do not meet these criteria should be listed, with their permission, in the Acknowledgments or in an appendix.

The order of authorship on the byline should be a joint decision of the coauthors. Authors should be prepared to explain the order in which authors are listed." (8).

Since the ICMJE authorship criteria were established in 1985 and their implementation has been encouraged in many medical journals, numerous investigators have studied to what extent these authorship criteria have been fulfilled among published manuscripts. Goodman found that about one-third of the 84 authors did not meet authorship criteria in an analysis of 12 articles (4). Shapiro et al, after surveying 184 multi-authored research articles from 10 medical journals, reported that 26% (268/1014) of the authors had insufficient contributions to the research to merit authorship (5). Hoen et al studied one year of issues of the Dutch Journal of Medicine and found that 36% (128/352) of authors failed in fulfillment of ICMJE authorship criteria (9). Recently, Yank et al found that 44% (346/785) of the authors in six months of issues of The Lancet did not fulfill the ICMJE authorship criteria (10).

Recently, in analysis of research papers published in Radiology between 1998 and 2000, 32.5% (2172/6686) of the researchers in the bylines did not meet the ICMJE criteria (11). Also, position in the byline indicated a significant difference of fulfillment ($p < .001$): 98.9% and 85.3% for the first and second authors, respectively, and 52.8% and 66.5% for the middle and last authors, respectively. American researchers had a higher percentage (78%) of fulfillment than that of international researchers (57%) ($p < .001$). Fulfillment decreased as the number of authors per paper increased ($p < .001$), although there was no significant change throughout study period (1998-2000) (11). According to the policies of both Radiology and the ICMJE, researchers who do not have substantial contribution to the all three conditions for authorship criteria should only be listed in the acknowledgements (8, 12). However, there were researchers who did not meet the authorship criteria but who appeared in the byline. The results of Hwang et al for disclosure of author contributions revealed firstly misunderstanding or unawareness of the authorship criteria or, if the criteria were well understood, the presence of honorary or guest authors in Radiology (11).

Recent trend for publishing individual author's specific contributions to the research(contributor lists)

The order of authors in the byline provides little information regarding each author's contribution to the research in multiauthored research papers. In order to disclose a researcher's specific contributions for journal readers, the use of a contributor list had been proposed (6, 13) and was adopted by The Lancet in 1997; in this disclosure the authors are not required to use any predefined categories or checklists of contributions but are free to devise their own descriptions of the tasks each author performed. Subsequently, a few journals began to publish author contributions including Radiology.

Despite their usefulness of contributors list to know individual author's specific contributions to their research, it cannot prevent undeserved authorship. Because science is a human effort and is thus inevitably contaminated with all human weakness (14). Authorship problems may not prevented by coauthor's signing solemn statement or disclosure of coauthor's contributions because those who lie can lie anytime (1).

Partial authorship(one of possible solution for undeserved authorship)

Because academic reward is one of the important factor causing unrightful authorship "Partial authorship" may decrease underserved authorship. Partial authorship is based on a system, under which an article bears one unit of authorship that is equally divided among authors. This system could be made more sophisticated by ascribing higher partial authorship to the first or corresponding author, by associating the article's authorship units weighted by journal's impact factor (15).

It is incomplete solution for author problems that partial authorship or publication of contributors lists. However, here is an evident need for action for authorship abuse because even imperfect solution is better than that a lasting dilemma. Also, there is need for clarification and continual education of the ICMJE's authorship criteria. Although there may not be wide agreement or recognition for ICMJE authorship criteria, we believe that fulfilling ICMJE's criteria as the standard for authorship is essential for justified authorship.

References

1. Marusic A , Marusic M. Authorship criteria and academic reward. *Lancet* 1999; 353:1713-1714..
2. Sheikh A. Publication ethics and the research assessment exercise: reflections on the troubled question of authorship. *J Med Ethics* 2000; 26:422-426..
3. Flanagan A, Carey LA, Fontanarosa PB, et al. Prevalence of articles with honorary authors and ghost authors in peer- reviewed medical journals. *JAMA* 1998; 280:222-224..
4. Goodman NW. Survey of fulfillment of criteria for authorship in published medical research. *BMJ* 1994; 309:1482..
5. Shapiro DW, Wenger NS , Shapiro MF. The contributions of authors to multiauthored biomedical research papers [see comments]. *JAMA* 1994; 271:438-442..
6. Rennie D, Yank V , Emanuel L. When authorship fails. A proposal to make contributors

- accountable. JAMA 1997; 278:579-585..
7. Athanasoulis CA. Authors need to Be educated on authorship principles. Radiology 2000; 217:598-599..
 8. International Committee of Medical Journal Editors \cong ? Uniform Requirements for Manuscripts Submitted to Biomedical Journals. Updated May 2000. Available at: <http://www.icmje.org> Accessed June 6, 2000..
 9. Hoen WP, Walvoort HC , Overbeke AJ. What are the factors determining authorship and the order of the authors' names? A study among authors of the Nederlands Tijdschrift voor Geneeskunde (Dutch Journal of Medicine). Jama 1998; 280:217-218..
 10. Yank V , Rennie D. Disclosure of researcher contributions: a study of original research articles in The Lancet. Ann Intern Med 1999; 130:661-670..
 11. Hwang SS, Song HH, Jeong SL, et al. Researchers' Contributions and Fulfillment of the ICMJE Authorship Criteria: Analysis of Author Contributions Lists in Multiauthored Major Research Papers Published in Radiology. Radiology 2003; In publishing..
 12. Publication Information for Authors. Radiology 2000; 217:41A-50A..
 13. Godlee F. Definition of authorship may be changed. BMJ 1996; 312:1501-1502..
 14. Eccles JC. Facing reality. Philosophical adventures by a brain scientist. Heidelberg Science Library 1970; 1315. Klaic B. Analysis of scientific productivity in Croatian according to the Science Citation Index, Social Science Citation Index, and Arts and Hamaunities Citation Index for the 1980-1985 period. Croatian Med J 1997; 38:88-98..