Viewpoint

Authorship: The Debate

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The Opportunity

From the time a medical student joins the medical college, he or she is constantly imbibed the habit of writing the observations and interpretation of medical subjects. The seeds of medical research and its publication are sown at an early age. History is replete with outstanding contributions from medical students. Sir James Paget (1814-1899) discovered the round worm *Trichinella spiralis* in 1834, one year after entering St. Bartholomew's hospital medical school. William Stokes (1804-1878) who became Regius Professor of Medicine at the University of Dublin, published *An Introduction to the use of stethoscope* in 1825 while he was still a student in Edinburgh. In our own country, the Indian Council of Medical Research (ICMR) encourages student research activities during their study period under the guidance of faculty members.

Beginning with a foundation that is sound, it is rather surprising that the number of medical graduates contributing to existing medical literature by way of publications is a fraction. Is it that the priorities have changed for all those who graduated from medical colleges? The question evokes an independent debate by itself. The priority for a young graduate is first acquiring academic qualifications, going on to establishing himself financially and getting recognition among his clientele and peers, the order being the same in majority. The exceptional graduate does get into good academic institution and practices medical research. That opportunity is not lacking for every graduate to develop the talent of 'authorship' is amplified by the requirement for a dissertation/thesis work which every student of medicine has to submit for obtaining a postgraduate degree. However this aspect has also lost its recognition. Most of the time dissertation work is taken as an incidental exercise and once the degree is acquired the 'bound and elegant' work is forgotten. It is but natural that the 'junior' loses out to his 'senior' in the race for recognition. Most of the time he is one of many co-authors of his own original contribution.

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The Recognition

Why the need for recognition? It is the very basic parameter for climbing the ladder of success. Medical research and publication are two important ways of acquiring recognition in the scientific world. We publish to exchange the information and to archive a work with some degree of permanence so as to leave a paper trail of evidence for future scientific work. Though viewed with certain amount of empathy, even brief and case reports do convey important messages to practicing physicians. Hence we publish to obtain promotion, to obtain grant support and to obtain accolades from our peers. The number and quantity of article publications highlighted in a *curriculum vitae* determine the success of an applicant in the quest for a lucrative job. Of course this reasoning may not sound that attractive to those graduate and postgraduates who devote their full time in community practice. The sheer lack of time may be one important factor as to why there are not many research publications

from this group. However the growing and intelligent clientele has an eye for the practitioner who is also recognized among academicians.

Authorship: The Beginning

Aristotle-a Macedonian logician and philosopher, the 'father of science' was the earliest known prolific writer. He wrote several hundred books covering every branch of learning. His major contribution was the principle that a theory was valid only if derived logically from observations of the real world. What inspires authors to put pen to paper? The power that drives authors can vary as much as the subjects they chose to write about. Some write purely driven by creative inspiration. Others write for purely money. And some are inspired by themselves. Scientists who became authors display a rich variety of publication habits. Isaac Newton was famously reluctant to publish and, when he did, to attach name to the work(l). Over the time medical research became more and more a team activity. Accordingly, publication of research papers also gradually evolved from single author to multiple authors. Because of the personal investment and because of the implications for their careers, academicians tended to concentrate on the credit they reap from publications. Perhaps for this reason, and the fact that there is increased competition for scarce funds, the byline for authors became longer and longer. The selection of the first author and other co author was arbitrary without any guidelines. Hence in the quest for 'recognition', the value of authorship got diluted.

Definition of Authorship: The Debate

It seems paradoxical that scientific research, in many ways one of the most questioning and skeptical of human activities should be dependent on personal *trust.* But the fact is that without *trust* the research functioning could not function. For editors and referees of scientific papers, even while they search for possible errors in the manuscript they review, have no choice but to assume that the authors have honestly reported what they did and what they observed. Historical reflection would suggest that Dr. John R. Darsee, a young clinical investigator, must have been the cause for the debate on authorship. He was found to have fabricated an extraordinary series of published findings, beginning when he was an undergraduate biology student at Norte Dane, continuing through his medical residency and Cardiology Fellowship at Emory University in Atlanta, and ending with a fellowship in the Cardiac Research Laboratory of the Brigham and Women's hospital, a Harvard teaching affiliate in Boston. Darsee's fabrications compromised the integrity of at least eight published papers, which were retracted later. A particularly good summary was published in *Science(2).* The first lesson emanating from this episode was that the co-authors were unaware of Darsee's manipulations because they had little or no direct contact with the work being reported. The New England Journal of Medicine, one of the journals to publish his two articles in 1979 and 1981 retracted the same in 1983 based on signed statements of co-authors and the Dean of Emory. The second message related to the efficacy of peer review. The Darsee affair gives a clear answer. Little or none. Unless a maladroit cheat fabricates results that are manifestly impossible or inherently contradictory, even the most rigorous peer review is not likely to uncover fraud. The third lesson is that detection of fraudulent results is difficult to expose. However, here science comes to the universal rescue. Science is self correcting. The nature of scientists to attempt repeating original studies helps always in identifying frauds.

The report by the Association of American Medical Colleges Adhoc Committee on the Maintenance of High Ethical Standards in the Conduct of Research in 1982 exemplifies this statement(3). The last lesson concerns the meaning of co-authorship. The co-authors by retracting their names, absolved themselves of all responsibilities for the published work.

Uniform Requirements: The Attempt

A small group of editors of general medical editors met informally in Vancouver, British Columbia in January 1978 to establish guidelines for the format of manuscript submitted to their journals. The group now expanded and known as the International Committee of Journal Editors (the Vancouver Group) drew up criteria for authorship, based on the concept that "each author should have participated sufficiently in the work to take public responsibility for the content(4). The committee has been meeting annually since then and its scope has broadened. Four editions of the uniform requirements for manuscript submitted to biomedical journals have been produced. In the latest edition, questions have been raised about other issues surrounding publication especially ethics(5).

A very lucid summary of the requirements for 'authorship' has been highlighted by Huth(6). The basic principles are as follows:

1. Each author should have participated sufficiently in the work represented by the article to take public responsibility for the content.
2. Participation must include three steps: *(a)* conception or design of the work represented by the article, or analysis and interpretation of the data, or both; *(b)* drafting the article or revising its critically important content; and (c) final approval of the version to be published.
3. Participation solely in the collection of data (or other evidence) does not justify authorship.
4. Each part of the content of an article critical to its main conclusion and each step in the work that led to its publication (steps *a, b,* and *c* in principle 2) must be attributable to at least one author.
5. Persons who have contributed intellectually to the article but whose contributions do not justify authorship may be named and their contribution described for example, "advice", "critical review of study proposal", "data collection", and "participation in clinical trial". Such persons must have given their permission to be named.

Guidelines: How Effective?

Almost universally journals have incorporated the Vancouver criteria into their guidance for authors. Of all the abuses of scientific research, "Gift"/"Guest", "Grafter" and "Ghost" authorship is the most common and the most lightly regarded. The trend is to accept or confer gift authorship. The rewards are obvious; tenure, promotion, research grants and fame. Further there is limited scope for detection. This explains why many people accept and/or expect the "gift" of authorship on papers to which they have contributed nothing intellectually. And, as with all presents, the givers often derive something too. They may use the authorship to repay kindness or in exchange for authorship of another paper. Crediting the Head of Department adds the additional benefit of 'stamp of authority'. Shapiro *et al.(7)* in a mailed, self administered survey attempted

to determine the contributions of each author to multiauthored biomedical research papers. Participants included 184 first authors for a consecutive sample of 200 papers with four or more authors published in ten leading biomedical journals. He found that 62 of their 1176 authors had made no substantial contributions to six major tasks (conception, design, ana-lysis and interpretation, and writing and revision plus collecting data and providing resources), while a further 206 contributed only by providing resources or collecting data. In the Goodman's study(8) only 32 authors out of 84 definitely fulfilled the Vancouver criteria for authorship and 19 possibly did so.

The Long Byline: Multiple Authors. The Need?

How many people can wield one pen? There are again no universally accepted criteria and the subject itself has generated some debate. In 1976, Strub and Black observed the rapid increase in the number of authors of a article(9). The role of multiple authors has been justified by the increasing specialization and the need for collaboration among members of different disciplines. However, Epstein has commented and observed that authorship inflation has not occurred to the same extent in basic science journals as it has in medical journals(10). In a random analysis of eight biomedical journals, the author noticed a trend towards increasing authorship numbers over the study period. General medical journals (Lancet, New England Journal of Medicine) had a median of six to seven authors per article. There were far fewer seven authors than six author studies, which suggested that author number may be influenced by the Vancouver convention which precludes citation of more than six authors. The data suggested that conferral of authorship may sometimes have a volitional component contributing to rising number of authors per article(lO). In a historical reflections on the problem of authorship, Benson has given reasons for believing that the inflation in numbers of authors had nothing to do with an increase in either collaborative or interdisciplinary research. Medicine has not become more fragmented or specialized than basic science. Other factors as mentioned earlier have played a role(11).

Uniform Requirements: The Revisions

In 1989, the editors of Journal of American Medical Association (JAMA) instituted new requirements that all authors sign statements of authorship responsibility and financial disclosure(12). In another modification JAMA permitted authorship to be attributed to a group, as long as all members of that group meet full criteria for authorship and sign a statement that each has "participated sufficiently in the conception and design of this work and analysis of the data, as well as the writing of the manuscript, to take public responsibility for it"(13). In a another attempt to reduce the number of authors, the concept of *acknoxvledgement* was introduced. Inclusion in an acknowledgment indicates that an individual has made important technical, advisory, or reviewer contributions to the project, although these contributions are not sufficiently broad to warrant authorship credit(4).

In an effort to give sanctity to authorship, the Swedish Medical Association and its journal recommend that researchers should decide who should be an author at the outset of the work and not when the paper is being written. It has been also proposed that replacement of the Vancouver convention with a 'first author', 'last author' citation system may help stem rise in author numbers. Huth(6) also suggested

the sequence of authors. The relative contributions of authors to the intellectually most critical aspects of the work should determine their sequence. Contributions in concept and design of study, or interpretation of data should be given greatest weightage. The first author should have made major contributions as per the Vancouver convention and the following sequence of authors should represent progressively lesser contributions. In a effort to change the present "quantity of papers" to "quality of papers", the higher education funding councils for England, Scotland and Wales and the Department of Education for Northern Ireland will evaluate only the four best papers researchers have published within the previous three years. The new guidelines state that supervisors need not be included in the authorship, but they can list in their own application papers written by research assistants and research students in their departments. The action has been taken to emphasize quality and to counteract the growing concern over efforts to increase publications lists by splitting large studies into a series of short papers and the practice of adding names as co-authors to as many publications as possible(15).

Editors Choice: What is **New?**

It is clear that the Editors of a biomedical journal have a tough job in screening thousands of manuscripts being submitted for publications. Setting standards and ensuring continuing recognition of the journal are crucial to the editorial board. Detecting fraud has its limitations. Even the most rigorous peer review is not likely to uncover fraud. In a attempt to give more credential to the authors, British Medical Journal is introducing the concept of authors nominating their own referees. The articles will have peer review of their choice. The journal also proposes to monitor the working of the *reviewers* also. Informed consent and its intricacies, another topic of debate has been reviewed by Doyal, a professor of medical ethics(16). He argues that the principle of informed consent to participate in medical research is fundamental if patients are competent volunteers. Consent is not needed when patients are incompetent to give it (young children, unconscious patients, *etc.);* when research uses only medical records; and when stored human tissue is used. Before publishing the results of such research, however, journals must ensure that certain minimal conditions are complied with. Debating the issue, Tobias, an oncologist argues that journals should be free sometimes to publish research in which patients have not given fully informed consent. He points to the practical difficulties of obtaining fully informed consent from all patients and, because of this, poor recruitment into trials. He suggests that a helpful approach would be to obtain "blanket" approval at the outset of treatment for inclusion in studies that might be in progress during the patient's illness - accepting that the doctor would always act in good faith and be prepared to explain treatment at any time(16). Smith, in an editorial comment invites the attention of authors to this vital issue and debate has been initiated as to whether medical journals should publish results of articles that do not include fully informed consent(17). Another potential hurdle for a author (to many existing one's) is going to be added. Electronic publishing is another structural transformation of the sciences. It aims at overcoming two grave problems of authors. The first obviously is the lag time submission to publication. The second problem, less obvious but more important to maintenance of the fabric of science, is the pressure from editors to authors to condense, to simplify, and to modify the data itself. The act of publishing a report

electronically was the first step. Now the reader is able to scan not just the compressed references to other articles, but also the abstracts of those articles. There will be option to demand the referee's report and perhaps the raw data also. This form of publication will invite open criticism, suggestions, rebuttals; the article so published will be able to go through revisions on the screen, with comments and old versions retained for reference.

The Indian Scenario

There is paucity of literature on this vital issue. A debate has never been initiated. The journal-Issues in Medical Ethics has several articles published on ethical issues facing members of medical profession. In a review article on authorship, the author describes the Indian experience. It is common experience that if the paper is to be presented in a local conference, the person who has done most of the work would be first author and present the paper. If it is a national conference, the head of the Division/ Department presents the paper and takes credit as a first author of the paper. If it is an international conference, the Director of the Institution presents the paper and hogs the limelight. Further the names of the author on an Indian paper are often in South Indian style. The name of a South Indian would show his community first and then, in a descending order, the names of the village, the grandfather and the father. At the end would be the person's name. The list of authors on an Indian paper follows the same pattern, starting with director of the Institute and going all the way down, humble scientific worker ending up as the last author of the paper(18).

The Deficiencies in the Guidelines

Like all guidelines, Vancouver guidelines on authorship also have certain lacunae or ambiguity. In every research oriented publication it is assumed that every contribution has been credited. The guidelines do not mention about those whose names have been missed out and acknowledged. Traditionally, Director of a Research Institute usually reserves the right of approving what is being published from the Institution. It is very easy to convert this right of approval into that of participation. In fact the Vancouver guidelines include approval right as a reason for authorship. Working with a string of intermediate bosses is a peculiar situtation in the Indian scientific scene. Are they to be included as authors? The role of technicians is of paramount importance in any research field. However, they are usually neglected and not acknowledged. In a similar vein and more ethical, majority of publications do not acknowledge the patient population.

The Message

"Authorship cannot be conferred; it may be undertaken by one who will shoulder the responsibility that goes with it"(19). Basic to the whole issue is *trust.* In science, as in other human activities, trust has its risk, but they are far exceeded by the benefits. Further scientists are human and therefore some of them - hopefully very few - will cheat. Stricter the guidelines become, more potential 'authors' including the budding one's will either not get initiated or get weaned off at a very early stage. The existing convention for authors is all encompassing and the new modality of publications-electronically will bridge the void - if any, between the editor and author. In the Indian context, before any conclusions can be drawn, there is a need for in depth analysis of leading biomedical journals on the pattern of Epstein(10). Of course this manuscript should also excite the *brains* and readers to get the benefit of critical comments.

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