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OPINION ARTICLE

Abbreviations In Medical Writings: Do They Also Abbreviate Our Science?

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Summary

Purpose: *Abbreviations are commonly used in medical literature. Despite the obvious advantages of facilitation and simplification of communication, their use can be a cause of medical errors, irritation, misunderstanding and even alienation. There are strict guidelines for their use. There are scarce data about the adherence of authors and editors to these guidelines. However, the few studies that have assessed this question showed discouraging results. The poor understanding of abbreviations highlights the value of minimizing their use and defining abbreviations when they are used.*

Key words: *acronymophilia, acronyms, abbreviations, bioethics, research, medical writing*

Introduction

The use of medical abbreviations in medical science is not a new concept. Since the establishment of modern medicine, abbreviations have been used in multiple settings including the writing of prescriptions, medical documentation and scientific literature. Abbreviations and jargons can be useful since they may facilitate, simplify and speed up communication, not only in medical but also in social interactions [1].

However, there is an increasing overuse or even misuse of abbreviations, the so-called ''acronymophilia'' that can be a source of irritation, misunderstanding, medical errors and alienation [2]. The International Committee of Medical Journal Editors recommended the use of only standardized and widely accepted abbreviations, since nonstandard abbreviations can be confusing or even misleading to readers. In the same vein, abbreviations should be avoided in the headlines of medical manuscripts such as the title of the manuscript and the abstract with the spelled-out abbreviation followed by the abbreviation in parenthesis being on first mention unless the abbreviation is a standard unit of measurement [3].

The purpose of this article is to summarize currently published knowledge on the role of abbreviations in medical writings, the compliance of authors and editors to current guidelines and the dangers of unnecessary use of abbreviations in medicine. Do they abbreviate science as well?

Why We Use Abbreviations?

An abbreviation is a shortened form of a word or phrase used chiefly in writing to represent the complete form (*e.g.* US for United States). Similarly, an acronym is an abbreviation consisting of the first letters of each word in the name of something pronounced as a word (*e.g.* AIDS for acquired immunodeficiency syndrome). Acronyms are often misused to refer to any arrangement of letters that stand in for full words, such as BBC for British Broadcasting Corporation. However, words like these actually are termed initialisms. Most medical

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literature uses the term abbreviation to refer to both acronyms and initialisms [4].

Abbreviations can be useful if used rationally by medical writers. First of all, they can increase the efficiency and speed of medical communication. Also, since many journals have word and space limitations, using abbreviations can be an effective way to condense a scientific message. In order to be an efficient way of communication, abbreviations are mostly useful among peers since they can offer a way of ingroup identification and a channel of sharing ideas, knowledge and information in a coded fashion. The latter can increase the perceived importance of information and also maintain the safety and accuracy of the message shared. Finally, abbreviations can create an impression of scientific complexity of the shared knowledge.

Abbreviations Can Be Problematic

Extensive use of abbreviations can frequently be problematic. First, abbreviations can have multiple meanings [5]. For example, AST has more than 30 different meanings, and at least 4 in medicine related terms [6,7]. Also, reading uncommon or less familiar abbreviations are not well understood and we have to consume time and energy to understand their meaning through its parent words [8]. This can be a particular problem especially when there is no visual or written perception of the abbreviation but only auditory such as listening to a conference presentation where the listener has to assimilate information quickly. The latter increases the chances of misunderstanding of the message or -even worse- completely forgetting the context of the talk [9]. Thus, it should be recommended that in lectures and presentations, uncommon abbreviations should be avoided since they might detract from the important messages being conveyed.

The "causa causans" of the extensive and unnecessary use of abbreviations in medical writing is the fact that authors have forgotten how difficult it is to be a reader. The so-called "*curse of knowledge*" is the sense that many authors have difficulty in understanding what it is like to not know something. Thus, they tend to overestimate the potential of the audience or readership to understand the message from abbreviations that already exist, and especially from abbreviations that are christened by an author for a single work. Also, the pressure of time and the strict deadlines have triggered the discounts from the optimal writing ethics [10]. Authors usually do not realize that their articles might not be read by experts on their scientific field alone, but also by scientists outside their area of expertise or even outside medicine and science in general. This erects barriers to the understanding of science by publishing articles with abbreviations that make reading difficult for anyone not intimately familiar with that specific field.

Author and Editor Non-Compliance

An early study addressing the frequency of uncommon abbreviations in medical and surgical journals showed that 43% of articles contained unfamiliar abbreviations [11]. Another study showed that nearly one in three abbreviations were not defined on first use in orthopedic literature with 12% of abbreviations defined and never used again and 4% of abbreviations defined more than once. The authors concluded that nearly half of abbreviations were improperly used [12], which is consistent with the aforementioned literature.

We believe that abbreviations might be common in scientific communication but are mostly unnecessary. Unfortunately, it seems there is a lack of conscientious writers or speakers to create a culture of not using by default. Abbreviations can confuse and alienate unfamiliar audiences, and even well-intentioned writers and speakers may overestimate an audience's familiarity with abbreviations. Abbreviations shouldn't be completely avoided, but using them as a default can be problematic. Mindful writers will notice that most abbreviations are unnecessary and will choose to replace them with the meaningful words that underlie them. In the era of "Dr. Google" and web-like medicine [13], academic literature should be approachable to society to serve it primary role which is the scientific truth and the benefit of humanity [14].

Moving Towards Scientific Openness

Scientific writing is technical and demanding. Sometimes, it can be difficult to read even for seasoned scientists especially when there are linguistic barriers between authors and readership. By collapsing words into abbreviations we have the risk of eliminating the impact of the scientific discovery and the educational purpose of academia. Many common abbreviations can be easily digested by the readership and the work is hardly compromised by not spelling them out.

More to the point, some abbreviations are processed as efficiently as the spelled-out words, whereas other abbreviations are unfamiliar, burdensome, and alienating. The challenge is in predicting the reader's level of knowledge and accurately guessing whether they will be familiar with the terms. Authors should not rely on their own intuitions about how familiar their readership is

with the abbreviations since it is hard to predict the exact characteristics of the audience of any publication. Scientific openness mandates a cultural default chance to fully written-out phrases. In some cases, it may be appropriate to use an abbreviated form of a phrase, but this should be the exception, not the default, and should only be done when the communicator has evidence that the abbreviation will be understood and processed fluently.

Final Remarks

Abbreviations are useful shorthands in complex medical language but they need to be used appropriately and not abused. Current literature does not support this recommendation. Authors and editors should keep in mind the readership since scientific knowledge must be aligned with the societal needs. Manuscripts are not published for the peers only but for the general readership as well. Thus, limiting the use of abbreviations in terms of number and familiarity does not jeopardize the quality of the scientific product. The real onus lies with editors to help their readers by ensuring that guidelines are being adhered to.

Conflict of interests

The author declares no conflict of interests.

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