

Editorial

THE HIERARCHY OF THE EVIDENCE-BASED MEDICINE PYRAMID: CLASSIFICATION BEYOND RANKING

The evidence-based medical literature is usually represented graphically as being arranged in a pyramid shape, the idea being that it is spread over several levels, with the higher ones, towards the top of the pyramid, being equated with higher standards and thus, implicitly, better quality evidence. In actual fact, this pyramid-shaped arrangement has given rise to many misconceptions over the years, and has certainly helped to create a sort of ranking not just of scientific output, but also of the producers of scientific research; indeed, those whose work is supported by a higher level of evidence are considered to occupy the higher echelons of the pyramid and thus to be good researchers, while those whose work positions them at the base are considered mediocre ones.

*On closer analysis, however, the pyramid is an image that presents us (or should present us) with a very different view of this hierarchy of science. First of all, a pyramid, being a solid geometric shape, is a well-defined structure. Its apex, if considered in isolation without its body and base, has no conceptual value. At this point, I wish to point out that the word pyramid comes from the Greek *pyramis* (πυραμῖς), which literally means “having the form of fire” (from *pyr-*, “fire”). Some historians believe that the Greek word, in turn, comes from the Egyptian term “*per-em-us*”, which in the Rhind Papyrus was used to indicate the height of the pyramid (literally “that which ascends”). The Greeks, applying synecdoche (the figure of speech where a part stands for the whole, and vice versa), would have used it to indicate the entire monumental construction. Thus, while the pyramid is certainly an object that has an upward pointing tip (*pyramidion*), it is certainly more than just its tip.*

Furthermore, looking at the architectural structure of the pyramid, be it smooth or stepped, one sees that it is made up of a certain number of elements (bricks), which become progressively fewer in number the closer one draws to the top. In other words, the higher up the pyramid one goes, the fewer are the elements that comprise each of its layers (or levels), and each layer (or level) must, of course, rest on a broader underlying layer (or level).

It can therefore be concluded that the levels of the evidence pyramid should be considered indispensable to each other, and also that they should be regarded as a tool to be used for categorisation purposes (where does this article go? what level of the pyramid does it belong to?), not for drawing up a ranking of the best and the worst, the more and the less successful. After all, each level represents the correct and necessary prerequisite for starting to build the one above.

Levels of evidence are necessary because they allow us to interpret the reliability of information for the purpose of formulating recommendations for clinical practice. When we are confronted with a clinical question (which is better, treatment A or treatment B?), the evidence pyramid provides us with indications on how comprehensive and reliable the answer currently provided by the scientific literature can be considered to be. It is of course impossible to think of designing a prospective randomized trial (level I) unless an adequate and necessary number of lower level studies have already been conducted – the first of these are often pre-clinical (laboratory or experimental animal) studies in order to justify the subsequent performance of further studies that are increasingly complex and costly in terms of time and human and economic resources.

Finally, there is also an ethical issue, which is perhaps the most important element to consider when constructing an evidence pyramid, especially if the question relates to the efficacy and appropriateness of a new treatment. It would be totally unacceptable, for example, were a pharmaceutical or biomedical company to market a new drug or device, or propose a new surgical technique, without first having verified through the correct process (leading from the base to the apex of the pyramid) its safety and efficacy – a process allowing them to claim, with an acceptable margin of error, that the new treatment is useful and necessary. That really could not happen. Or could it?

Giuseppe Milano, MD
Editor-in-Chief
Joints