
Correspondence

Parallel hierarchy of scientific studies in cardiovascular medicine

Clinical practice and research are based on training, experience, and ongoing education. Pivotal to further improvements is, however, the dissemination of new findings. In this respect cardiovascular specialists do not differ from other clinicians. Indeed, cardiologists committed to writing a scientific study face the hurdle of choosing the most appropriate study design. Plenty of different alternative choices also stand in front of the busy reader of cardiovascular literature.

Clinical reports may be distinguished on the basis of sample magnitude and of methods of comparison, as subjects can be compared within a single group or using a control group. On the other hand, clinical studies may be graded on the basis of their approach, flexible versus rigorous (Fig. 1). Authors can thus choose the most flexible and simple approach to clinical writing, involving a single particular patient, the case report¹. Similarly, the collection of cases can form series, and, when followed prospectively, single cohort studies². The adjunct of formal control groups adds reliability and robustness, but reduces flexibility. This is the case of controlled studies, which may include multiple cohort studies, case-control

studies and registries. The most formal and rigorous scientific report, and indeed the most trusted by busy clinicians, is the randomized controlled trial³, especially when its results, due to multiple center enrolment, may be reliably extended to clinical practice.

A similar approach may be used for the assessment and design of review studies. This kind of scientific report has several merits and can have a profound impact on readers. Reviews have been nonetheless criticized because of the lack of a formal and rigorous scientific approach. In fact, reviews, just as clinical reports, can be very flexible and writer-friendly or, on the contrary, very rigid and rigorous. We may identify the most flexible and subjective overview, the qualitative review, which has no explicit methods and gives the author absolute freedom to quote, discuss and summarize in a non-quantitative fashion⁴. A step closer toward formality is the systematic review, which employs explicit methods to search, collect and evaluate available evidence pertaining to the debated subject. This type of review, however, does not attempt to quantitatively summarize the overview process. Quantitative reviews (i.e., meta-analysis) statistically pool evidence from individual studies to test hypotheses⁵. Despite their merit of providing

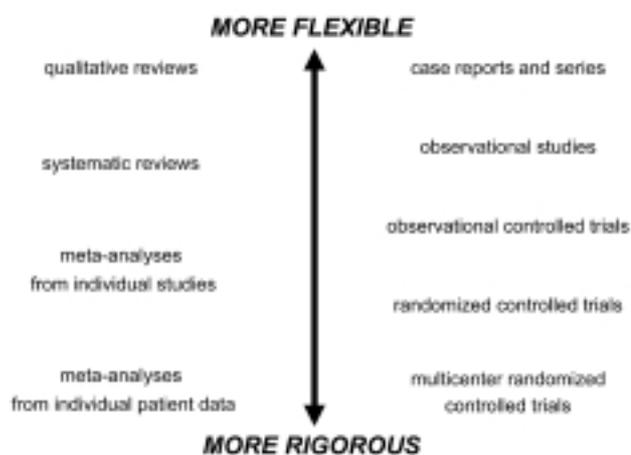


Figure 1. Schematism of the parallel hierarchy of scientific studies in cardiovascular medicine, focused on flexibility versus rigorous approach.

firm estimates of effect and association, the scope of meta-analyses is more limited and their results cannot be easily extrapolated. These are thus very rigorous studies that unfortunately leave much room for discussion and hypothesis-generation. The most scientifically rigorous review is indeed a particular type of meta-analysis that employs data from individual patients, thus yielding very precise quantitative estimates. As can be easily imagined, this last kind of review is however fraught by several logistic, methodological and economic hurdles.

In summary, there are several types of clinical reports and reviews in cardiovascular medicine which provide authors and readers with a powerful means of reaching their clinical or research goals. While studies have different flexibility of approach or rigorous methodology, any study design can prove very useful and yield important results when used appropriately.

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