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EDITOR'S PAGE

Meta-Analysis Bouillabaisse

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There has been considerable interest in the use of meta-analysis to conduct systematic reviews of a focused topic in the cardiovascular literature. In *JACC: HF*, we have seen a significant increase in the number of meta-analyses submitted, and they have come from numerous organizations around the world.

The strategy of meta-analysis is to provide a structured and standardized approach for analyzing prior findings on a specific topic in the literature. Meta-analyses may be quantitative, and although the results may be convincing, they are also limited by numerous methodological issues that we expect to be addressed in the journal. Meta-analyses can be quite powerful, as they can be used to form treatment recommendations or provide guidance in designing future clinical trials. The literature is replete with examples where a meta-analysis has shown strikingly positive effect sizes, for example, magnesium in acute myocardial infarction (1), but the large, randomized trial did not confirm this finding.

There exists a standardized approach to the reporting of meta-analyses. The journal editors believes the PRISMA Statement (2) checklist should be performed by every investigative group submitting meta-analysis to this journal. Some of the most important items for this journal are:

1. The most important aspects of developing the meta-analysis are the question being addressed and the type of studies included in the analysis. The goal should be to include a study group that is homogenous, that is, trials that are similar in conduct and with similar inclusion and exclusion criteria, duration, and endpoints. If there are variations in duration of surveillance on the outcome endpoint, important differences and biases in the results may occur.
2. Literature searches are a critical component of the methodology for meta-analysis. The method of conducting the search should be described. In addition, searching abstracts over the preceding 5 years should be conducted, as well as providing surveillance of the ClinicalTrials.gov website for any trials that may not have yet been published but are in existence.
3. Data extraction should be conducted by 2 or more authors of the meta-analysis. It is preferable that 1 or several of the authors have taken part in some of the clinical trials that are being included in the meta-analysis, thus providing a deeper understanding of the clinical field of the individual trials and some of the challenges of the data that may exist in their trials or the competing trials.
4. There are several common statistical methods used in the meta-analysis. Statistical tests for homogeneity and heterogeneity should be conducted. If this test is significant, calculated and combined estimates may not be appropriate, and therefore, in this case, the reviewer should examine the studies and see if they were appropriately included in the meta-analysis.

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5. Sensitivity analysis should be conducted on all meta-analyses. Values at the extreme for risk estimates may contribute to uncertainty, and one might want to include or exclude trials at the fringes of the inclusion and exclusion criteria and range of effect size.

In summary, having a standardized approach to meta-analyses, with a carefully conducted inclusion of clinical trials, design of the question, internal validity, and properly addressed heterogeneity, can result in a high-quality study. By applying this systematic approach to meta-analyses, the quality of these studies can be enhanced, and we can avoid the "meta-analysis bouillabaisse."

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