



The Role of Systematic Review and Meta-Analysis in Evidence-Based Medicine

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Evidence-based medicine (EBM) has been defined as the “conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients.”¹ The first important principle of EBM is hierarchy of evidence expressed as an “Evidence Pyramid.”^{1,2} Based on this principle, the result of research is different based on study design.¹⁻³ Systematic reviews and meta-analyses have been placed at the top of this pyramid.^{1,3,4} Case series/reports have been placed at the bottom, case-control and cohort studies in the middle, and randomized controlled trials (RCTs) below systematic reviews and meta-analyses on the pyramid.²⁻⁴

The Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group modified the traditional pyramid. GRADE concluded that study design alone appears to be insufficient as a surrogate for risk of bias. In any type of study, limitations, imprecision, inconsistency, and indirectness could be factors that affect the quality of evidence derived independent of the study design. For example, randomization and blinding were not adequate in most trials. Consequently, the straight lines separating study designs in the pyramid become wavy lines.^{3,5}

The second challenge to the “Evidence Pyramid” is a framework presented in the Journal of the American Medical Association User’s Guide on systematic reviews and meta-analyses. Based on this guide, a two-step approach was defined to evaluate systematic reviews. First, the credibility of the process of a systematic review was evaluated (comprehensive literature search, rigorous study selection process). Second, the certainty in evidence based on the GRADE approach was evaluated. Consequently, systematic reviews and meta-analyses were removed from the top of the pyramid and

employed as the lens through which other types of studies should be seen (i.e., appraised and applied).^{3,6}

Clinicians and other stakeholders should consider that systematic reviews/meta-analyses have been high, moderate, low, or of very low quality although ranked as A level. In other words, a systematic review and a meta-analysis of well-conducted RCTs at a low risk of bias cannot be similar in confidence compared with a meta-analysis of observational studies (i.e., cohort, case-control, or cross-sectional) at a higher risk of bias.

Conflict of Interest Disclosures

The author declares that he has no conflicts of interest.

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