SF04-S1 GU Ultrasound: From Exam to Evidence

14:00-14:30 GBR 102

Chairperson(s): **Sung Kyoung Moon** *(Kyung Hee University Hospital, Korea)*
Bum Sang Cho *(Chungbuk National University Hospital, Korea)*

Meta-Analysis: What for and How to

Pyeong Hwa Kim
Department of Radiology, Asan Medical Center, Korea

Systematic review and meta-analysis has become important methodology for summarizing the current literature to provide high-level evidence from diverse and conflicting results. Meta-analysis is a statistical method that combines results from two or more separate studies. It has several novel advantages: there is no need to analyze patient data, it can address questions that are not possible to answer in individual studies, and it can facilitate future research by identifying unmet needs in the literature. However, a single pooled estimate may be insufficient to explain complex clinical fields. Additionally, the results can often be biased when low-quality source studies are included. Therefore, it is essential to maintain optimal methodological quality for meta-analysis to obtain reliable results. This lecture will introduce the definition, strengths, and limitations of meta-analysis, and how to properly conduct it.

The first step before starting meta-analysis is to specify the research question. It is important to identify unmet needs that are not satisfied in the current literature. It is recommended to develop a research question using the PICO (population, intervention, control, and outcomes) framework. After specifying the research question, relevant research papers should be thoroughly searched based on the selection/exclusion criteria. It is strongly recommended to use at least two databases (e.g., PubMed/MEDLINE and EMBASE). Once selected, quality assessment of the included studies is conducted using an appropriate quality assessment tool. The Quality Assessment of Diagnostic Accuracy Studies-2 (QUADAS-2) tool is generally used for diagnostic test accuracy studies. Then, data extraction from the selected studies and data synthesis are conducted. A summary estimate can be calculated by weighting the individual results of the selected studies. In general, the sample size of the study is used for the weight calculation. Another crucial step is to evaluate heterogeneity and publication bias. If a significant between-study heterogeneity exists, a subgroup or meta-regression analysis should be performed to account for heterogeneity. A systematic review and meta-analysis should be presented according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

In conclusion, this lecture provides a brief overview and practical tips for conducting a systematic review and meta-analysis.