

Heterogeneity, consistency and model fit should be assessed in Bayesian network meta-analysis

We read with deep interest the article by Wang *et al*¹ aimed to compare the efficacy of 20 non-steroidal anti-inflammatory drugs (NSAIDs) in the short-term treatment of ankylosing spondylitis (AS). This Bayesian network meta-analysis indicated that etoricoxib was more effective in reducing pain in AS than some other NSAIDs. The result was very useful in the decision-making process, especially for pain relief in treating patients with AS. However, there are some worthwhile issues that need to be explored.

First, it is commonly agreed that meta-analysis, including network meta-analysis, should assess heterogeneity, which may be defined as the presence of variation in true effect sizes underlying the different studies. Unfortunately, however, heterogeneity was not assessed in this network meta-analysis. Between-study heterogeneity indicates the presence of effect modifiers, and variability in relative treatment effects has a bad impact on the external validity of trial evidence, and limits the ability to generalise from the results.² There may exist some potential covariates, especially for the various drug doses and treatment durations of the same NSAID, meaning that it is highly likely that there was heterogeneity. In addition, some extremely important covariates, such as drug dose, for the same NSAID should be considered in this network meta-analysis. The authors should consider the relative contribution of true variability and random variation due to biases. Perhaps Bayesian meta-regression should be conducted to consider the covariates. Second, unlike classical meta-analysis, Bayesian network meta-analysis combines all available direct and indirect evidences on the relative treatment effects.³ Inconsistency can also be caused by the effect modifiers and specifically by an imbalance in the distribution of effect modifiers in the direct and indirect evidence.⁴ Consistency assessing is also worthy of expectation. Third, a better model fit can reduce the inconsistency between direct and indirect evidences.⁵ Thus, model fit should be assessed to assure the reliability of the results as well. In order to provide reliable evidence, a checklist,⁶ which is intended for those who review evidence syntheses and those submitting syntheses, should be recommended.

Above all, perhaps, heterogeneity, consistency and model fit should be assessed in this Bayesian network meta-analysis to make the results more reliable for guiding clinical practice. We respect the great contributions of the authors, and we also very much look forward to seeing authors' response to these issues.

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