An approach for modelling multiple correlated outcomes in a network of interventions using odds ratios.

A multivariate meta-analysis of two or more correlated outcomes is expected to improve precision compared with a series of independent, univariate meta-analyses especially when there are studies reporting some but not all outcomes. Multivariate meta-analysis requires estimates of the within-study correlations, which are seldom available. Existing methods for analysing multiple outcomes simultaneously are limited to pairwise treatment comparisons. We propose a model for a joint, simultaneous synthesis of multiple dichotomous outcomes in a network of interventions and introduce a simple way to elicit expert opinion for the within-study correlations by utilizing a set of conditional probability parameters. We implement our multiple-outcomes network meta-analysis model within a Bayesian framework, which allows incorporation of expert information. As an example, we analyse two correlated dichotomous outcomes, response to the treatment and dropout rate, in a network of pharmacological interventions for acute mania. The produced estimates have narrower confidence intervals compared with the simple network meta-analysis. We conclude that the proposed model and the suggested prior elicitation method for correlations constitute a useful framework for performing network meta-analysis for multiple outcomes.