Meta-analysis of Odds Ratios from Heterogeneous Clinical Studies

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Abstract

Many systematic reviews of randomized clinical trials require meta-analyses of odds ratios. A conventional method estimates the overall odds ratios via weighted averages of the logarithm of individual odds ratios. However, this approach has several deficiencies due to the underlying assumptions and approximations. The goal of this study is to understand and quantify the methodological pitfalls in conducting a meta-analysis of odds ratios. The fixed-effect and random-effect models of pooled odds ratios are compared by applying to a meta-analysis of SNP studies. A popular statistical software R is used for the analysis along with SPSS and SAS. It is found that the point estimates and confidence intervals for the overall log odds ratio can differ substantially between the traditional and alternative methods, which would affect the resulting statistical inferences. It is recommended that for producing reliable results, the traditional methods for meta-analysis of odds ratios should be discouraged.

Keywords: clinical trials, logistic regression, meta-analysis, odds ratios