Important steps for a reliable meta-analysis

We read with interest the meta-analysis by Jacqueline Tate and colleagues.[1] Rotavirus is the main cause of severe diarrhoea in young children worldwide, and often leads to mortality.[1] Rotavirus vaccination seems to be a cost-effective intervention for prevention of infection and its consequences. Meta-analysis is one way to gather evidence in medicine, but some scientists do not accept this method because of the many biases that might affect included data. However, others believe that meta-analysis can provide fresh evidence for pooled prevalence and burden of diseases, and for effectiveness and adverse effects of treatments.[2]

We would like to draw attention to some points that can help to increase the reliability of meta-analyses. First, when doing a systematic review before a meta-analysis, all relevant databases should be searched to avoid database bias. Tate and colleagues searched only PubMed and therefore they might have missed important reports catalogued in other databases, such as Embase, Scopus, Ovid, ISI, and Google Scholar. A search in a generic search engine (such as Google) might also have been helpful to identify grey literature.

Quality assessment is a principal part of all systematic reviews and meta-analyses, but most reported meta-analyses do not include such an assessment, or do not report the method of assessment.[3] We would be interested to know if Tate and colleagues did a quality assessment and the method they used for critical appraisal.

How the investigators reached agreement about study selection and the κ coefficient should also have been reported. An important question is which heterogeneity test was done: Q^2, I^2, or τ^2? τ^2 is most useful when the number of studies in the analysis is low, because it is not dependent on this variable.[4] However, the statistical test of heterogeneity should not be the only determinant for data interpretation in meta-analyses—selection of patients and different baseline diseases should also be considered when determining heterogeneity sources.[5] Tate and colleagues[1] did not show the number of included studies in forest plots for each country; such plots would have enabled them to chose an appropriate heterogeneity test. Funnel plots assessing publication bias should also have been included. An additional funnel plot for language bias should also be drawn when no language limitation is included in the search.

Finally, for worldwide estimations of prevalence, analysis of survey data is the most appropriate method. Consideration of these points should lead to high quality, precise, and reliable meta-analyses in medicine.

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