The number needed to treat in pairwise and network meta-analysis and its graphical representation. Poster presented in the *25th Cochrane Colloquium*, September 2018, Edinburgh, UK.

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Background

The number needed to treat (NNT) is an absolute measure of effect used to communicate the effectiveness or safety of an intervention. The NNT is frequently used in the pairwise meta-analytical literature and several attempts have been made to optimise its graphical representation. However, the need to compare multiple treatments for a clinical condition to make informed health-care decisions requires the use of more complex statistical approaches, such as network meta-analysis (NMA). In spite of the widespread use of NNTs, they have not widely been used in NMA.

Objectives

To suggest ways to calculate a NNT in pairwise meta-analysis and NMA using dichotomous data, and to present graphical approaches of NNTs from NMA to facilitate interpretation of results.

Methods

A barrier to using NNT in (network) meta-analysis when an odds ratio (OR) or risk ratio (RR) is used, is the determination of a single control event rate (CER). We discuss five potential approaches to calculate the CER in meta-analysis, and present six graphical approaches for NNT for single or multiple outcomes assessed in a NMA. We illustrate the graphical approaches using a published systematic review and NMA on the comparative effectiveness and safety of cognitive enhancers for treating Alzheimer's dementia.

Results

The NNT calculation using a relative effect measure, such as OR and RR, requires a CER value, but different CERs may result in different NNTs. It is advised to calculate NNTs along with confidence intervals to include uncertainty around CER estimates. NNT results can be presented in several graphs. We suggest the NNT graphical representation in a barplot, Cates plot or forest plot for a single outcome, and in a bubble plot, scatterplot or rank-heat plot for at least two outcomes. Each plot is associated with different properties and can be used for different needs. For example, if uncertainty around NNT should be considered in decision-making, then a barplot or a forest plot can be used. If multiple outcomes need to be considered, then a rank-heat plot can be used.

Conclusions

Various graphs with different properties can be used to depict NNT. However, caution is needed when different considerations in NMA are made, including effect size and CER assumption across multiple comparisons, as these may impact NNT results and healthcare decision-making.