Development: a 3 year Research Collaboration between Pfizer and the University of Bristol.

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Objectives

Meta-analysis is a well-established methodology for combining the results of randomised controlled trials (RCTs) that compare the same treatments and outcomes. Network meta-analysis (NMA) allows the simultaneous comparison of multiple treatments [1,2] and provides a framework for model comparison and to assess evidence consistency [3]. Multiple doses and end-points can be compared in NMA by "lumping" similar doses and end-points, or by regarding them as separate treatments. "Lumping" introduces the potential of inconsistency between evidence sources. Separating treatments can lead to a sparse or unconnected network of end-points, or by regarding them as separate treatments. "Lumping" model comparison and to assess evidence consistency [3]. Multiple doses [1]. Dias, S., Sutton, A. J., Ades, A. E., & Welton, N. J. (2013). Evidence synthesis for decision making 2. Evidence synthesis for decision making 2. Dias, S., Welton, N. J., Caldwell, D. M., & Ades, A. E. (2010). Checking consistency in mixed treatment comparison meta-analysis.

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Neither the 6 or 12 week NMAs show any evidence of inconsistency (p>0.05 for all comparisons). For the trial end NMA we observe inconsistency between the posterior distributions for the direct and indirect evidence for the Rofecoxib vs placebo comparison (p=0.017) (Fig 2). The direct evidence suggests a much greater treatment effect, which is inconsistent with the weaker treatment effect predicted by the indirect evidence.

Discussion/Conclusions

NMA allows us compare treatment efficacy for a single endpoint even when we lack direct evidence for the comparison. Where both direct and indirect evidence exist we can use this to assess evidence consistency. We have shown that "lumping" data by time (i.e. using the trial end) in this example NMA leads to evidence inconsistency. If we wish to avoid lumping, the number of possible treatment comparisons is limited.

NMA uses a single measurement from each trial. In contrast, the MBMA methodology can make use of all trial data but there are no formal methods for the assessment of evidence consistency.

This project will combine MBMA and NMA methodologies, to make use of all the available data, allowing model consistency to be assessed and allowing treatments to be compared even where there are no head to head trials comparing them.

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