Bridging the Gap in Disconnected Networks in Network Meta-Analysis (NMA)

MSR68

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Conclusion

- The discussed NMA method can be leveraged in establishing the connection between the disconnected network of RCTs using single-arm and observational studies

Background

- Network meta-analysis (NMA) allows for the estimation of comparative effectiveness of treatments that have not been studied in head-to-head trials
- Relative treatment effects for all interventions can only be derived where available evidence forms a connected network
- It is often challenging to find randomized controlled trial (RCT) evidence for all potentially relevant treatments of interest, and as a result, evidence networks may be disconnected

Objective

- Incorporate observational or single-arm studies to address the disconnection in networks and leverage the connected network in conventional network meta-analysis

Methodology

- A hypothetical situation reflecting the disconnection between four RCTs was simulated
- In absence of common comparator, single-arm, and observational studies were considered to generate a connected network

Methodology

- Single-arm and observational studies were matched to act as each other's control group based on a distance metric derived from covariate information available in each study
- Median age and proportion of males were the key covariates considered in the calculation of the distance metric, a distance threshold of 0.1 was applied to identify the matching comparator
- Distance metric ranged from 0 to 1, where lower values indicate more similarity in the studies
- The three-level Bayesian hierarchical model was used in performing Network meta-analysis, and after assessment of heterogeneity, random effect model was considered

Results

- The connected network of studies reporting data for the proportion of patients with any adverse event is illustrated in Figure 1

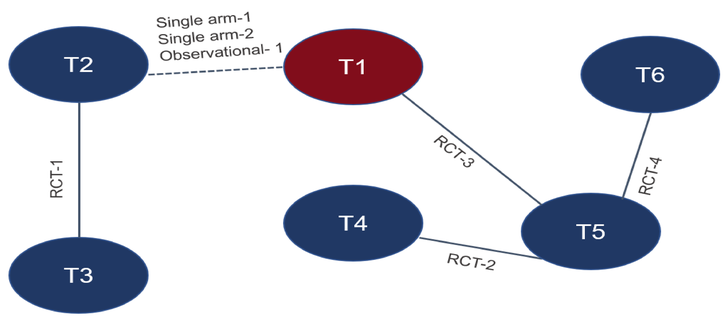

Figure 1: Connected network using single arm and observation studies

Results (Cont'd)

- NMA results indicated that treatment of interest was associated with statistically significantly lower odds for the occurrence of generic adverse events when compared with other treatments (Figure 2)

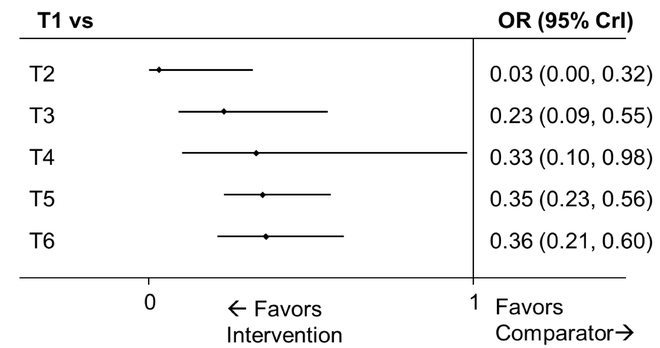

Figure 2: Forest plot of comparison between different treatments for the occurrence of generic adverse events

References

- Schmitz S et. al. The use of single armed observational data to closing the gap in otherwise disconnected evidence networks: a network meta-analysis in multiple myeloma. BMC Med Res Methodol. 2018 Jun 28;18(1):66. doi: 10.1186/s12874-018-0509-7. PMID: 29954322; PMCID: PMC6022299.

Disclosure

- Shubhram Pandey, Akanksha Sharma and Barinder Singh are employees of Pharmacoevidence; Kushagra Pandey is employee of Heorlytics; the authors, declare that they have no conflict of interest

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Sponsorship
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