

# Effect of statins in traumatic brain injury: A systematic review and meta-analysis

## INTRODUCTION

- Traumatic brain injury (TBI) is the main cause of death and disability in the first half of life
- Heavy burden on healthcare systems from both a resource utilization and costs
- Very few interventions in the acute phase of care shown to improve clinically significant and patient-oriented outcomes
- Statins have been suggested as a potential intervention for their role at mediating inflammatory injury
- Evidence is conflicting or limited regarding the potential effectiveness of statins in this population

## OBJECTIVES

To assess the effect of statins in critically ill adult patients following TBI

## METHOD

### Design

- Systematic review and meta-analysis (CRD42023421227)

### Outcomes

- **Primary** : Glasgow Outcome Scale (GOS) and GOSe (extended)
- **Secondary** : Mortality, intensive care unit (ICU) and hospital length of stay

### Eligibility criteria

- Randomized controlled trials comparing the use of statin to placebo or other interventions in adults with acute moderate to severe TBI
- Reporting at least one of our outcomes of interest
- No restriction for language or year of publication

### Search strategy

- Medline (PubMed), Embase, Cochrane Central and Web of Science databases and Clinicaltrials.gov

- Independent selection by two reviewers

### Data collection

- Trial data, study population, outcomes
- Cochrane Risk of Bias (RoB) 2 tool
- Independent data extraction by two reviewers

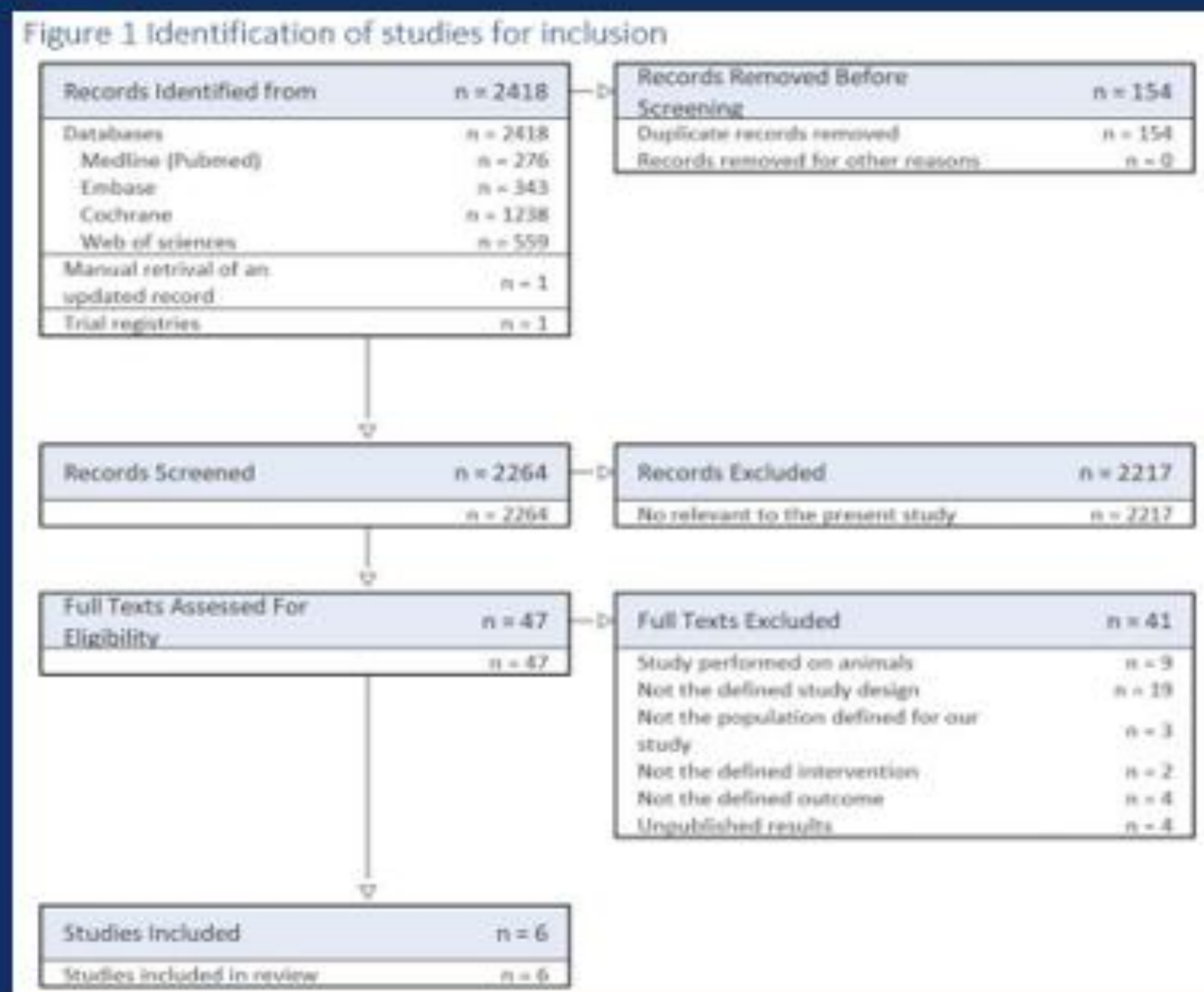
### Statistical analyses

- Random-effect models with inverse variance method
- Dichotomous data were reported using risk ratio (RR) while continuous variables were presented using weighted mean differences
- Statistical heterogeneity assessed with the  $I^2$

## AUTHORS

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## RESULTS



Of the 2418 retrieved records, six trials met inclusion criteria (n = 316). Duration of treatment ranged from 7 to 10 days and follow-up periods ranged from 14 to 180 days

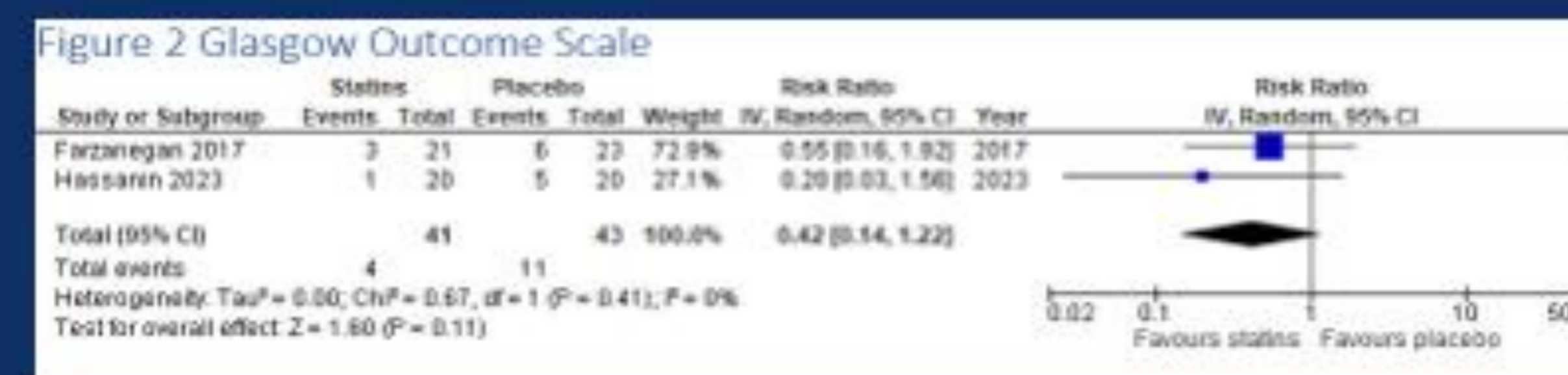


Table 1 Risk of bias of trials.

Trials	Risk of bias arising from the randomization process	Risk of bias due to deviations from the intended interventions (assignment)	Risk of bias due to deviations from the intended interventions (adherence)	Missing outcome data	Risk of bias in measurement of the outcome	Risk of bias in selection of the reported result	Other biases	Overall Risk of Bias
Naghbi, Madani	Low	Low	Low	Low	Low	Low	Low	Low
Farzanegan, Derakhshian	Low	Low	Low	Low	Low	Low	Low	Low
Soltani, Nassajian	Low	Low	Low	Low	Low	Low	Low	Low
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Soltani, Janatmakan	Low	Low	Low	Low	Low	Low	Low	Low
Hassani, Ali	Low	Low	Low	Low	Low	Low	Low	Low

## CONCLUSION

- Inconclusive evidence supporting the use of statin in acute moderate to severe TBI
- Limited data on neurological outcomes
- Risk of bias for most trials
- A well-designed large-scale multicenter trial evaluating the effect of statins in patients with moderate to severe TBI is needed

## ACKNOWLEDGEMENTS

This work was supported by a Foundation Scheme Grant from the Canadian Institutes of Health Research [FDN-148443].

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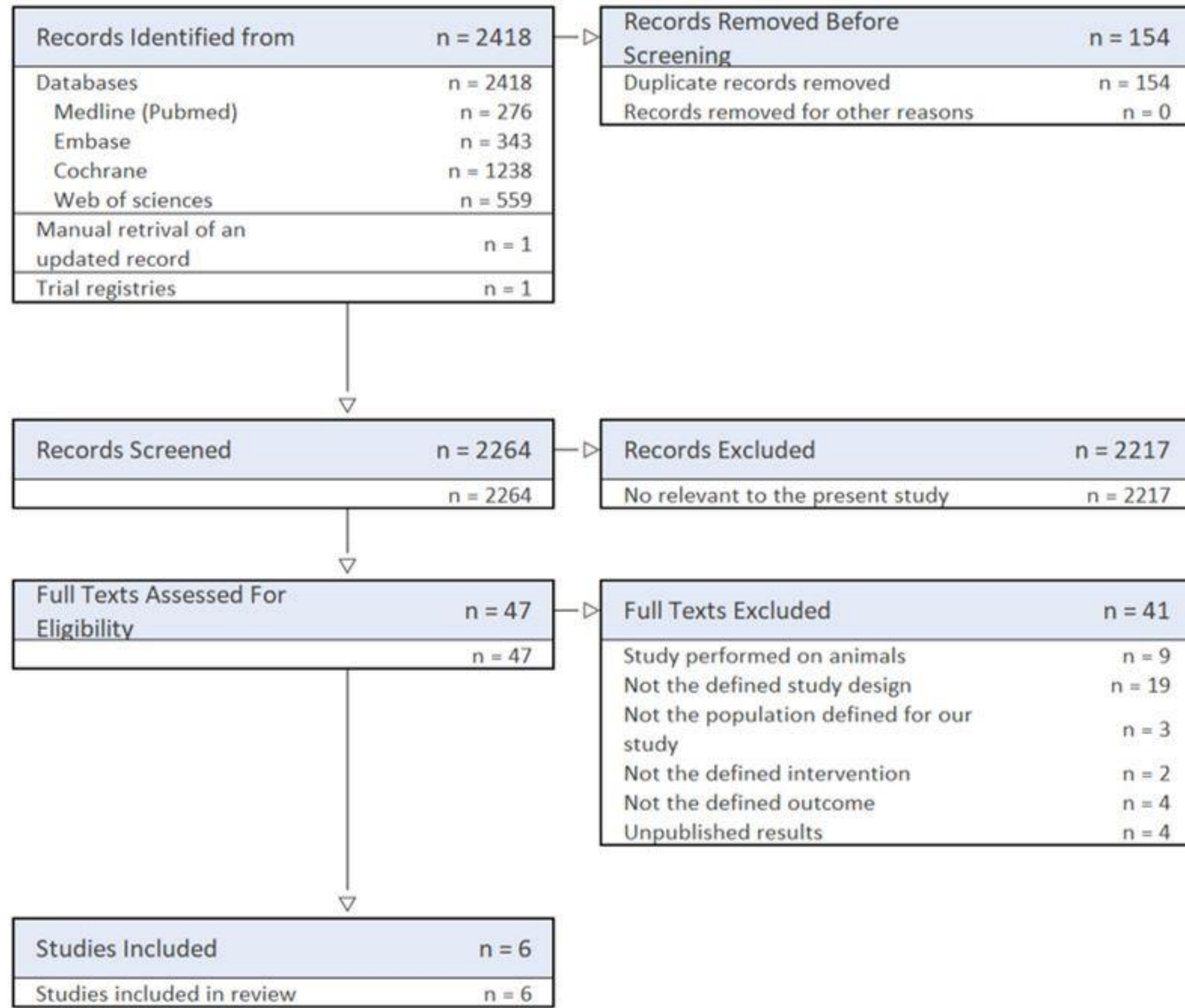
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Figure 1 Identification of studies for inclusion



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Figure 2 Glasgow Outcome Scale

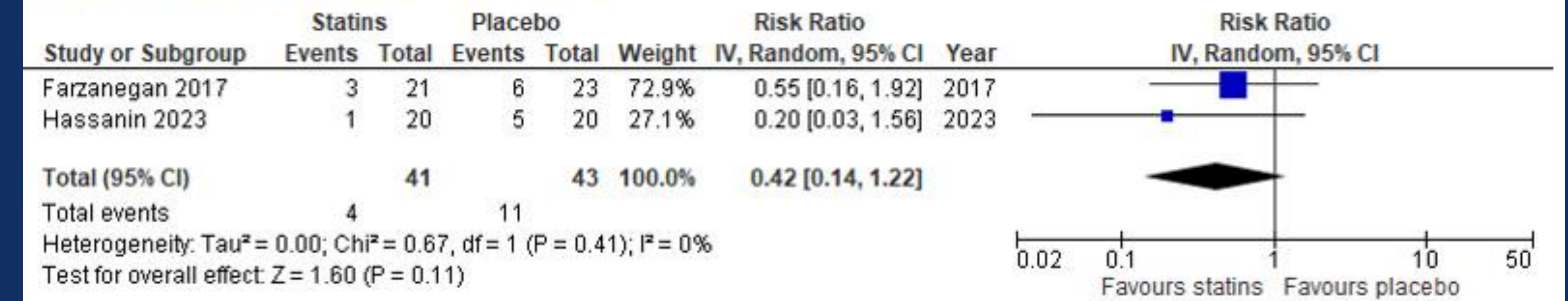


Figure 3 Mortality

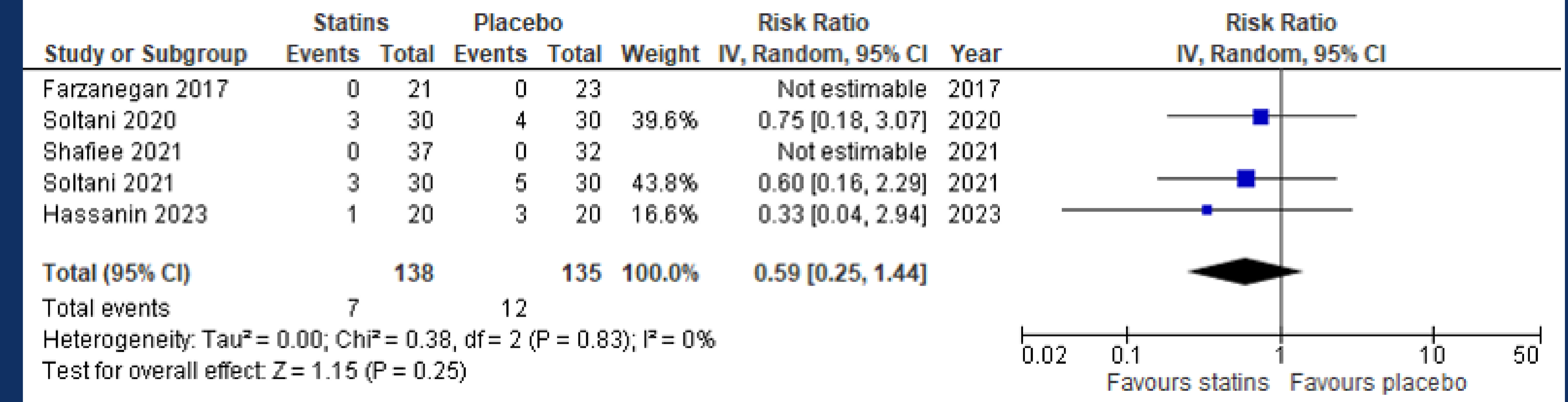


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Soltani, Janatmakan	Green	Green	Green	Green	Green	Green	Green	Green
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