

Association Between Statin Use and Survival in Multiple Myeloma: A Systematic Review and Meta-Analysis

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INTRODUCTION

Multiple myeloma (MM) remains an incurable plasma cell malignancy despite major therapeutic advances, with most patients eventually relapsing. Statins inhibit the mevalonate pathway and downstream protein prenylation involved in oncogenic Ras signaling and NF-κB activation, providing biologic plausibility for antimyeloma activity. Although population-based studies have suggested improved survival among statin users, the overall magnitude and consistency of this association remain uncertain.

AIM

To evaluate the association between statin exposure and survival outcomes in patients with multiple myeloma through a systematic review and meta-analysis of observational cohort studies.

METHOD

- A PRISMA-compliant systematic review and meta-analysis of observational cohort studies was performed.
- Adjusted hazard ratios (HRs) were pooled using a random-effects inverse-variance model.
- The primary outcome was all-cause mortality, and the secondary outcome was MM-specific mortality.

CONCLUSIONS

Statin exposure was associated with improved survival in multiple myeloma, although the observational evidence precludes causal inference. Given their safety profile and low cost, statins are promising candidates for therapeutic repurposing and warrant evaluation in randomized clinical trials.

RESULTS

Four population-based cohort studies involving 21,129 patients were included. **Statin exposure was associated with a lower hazard of all-cause mortality** (pooled HR 0.83, 95% CI 0.77–0.90; I²=72.3%).

Two studies reporting multiple myeloma-specific mortality likewise demonstrated a **lower hazard of disease-specific mortality** (HR 0.75, 95% CI 0.68–0.84; I²=0%). Leave-one-out analyses demonstrated stable pooled estimates.

Restricting the analysis to time-varying exposure models to address immortal time bias yielded a similar association (HR 0.85, 95% CI 0.74–0.98), although heterogeneity increased (I²=84.7%) and the prediction interval crossed unity (0.50–1.32).

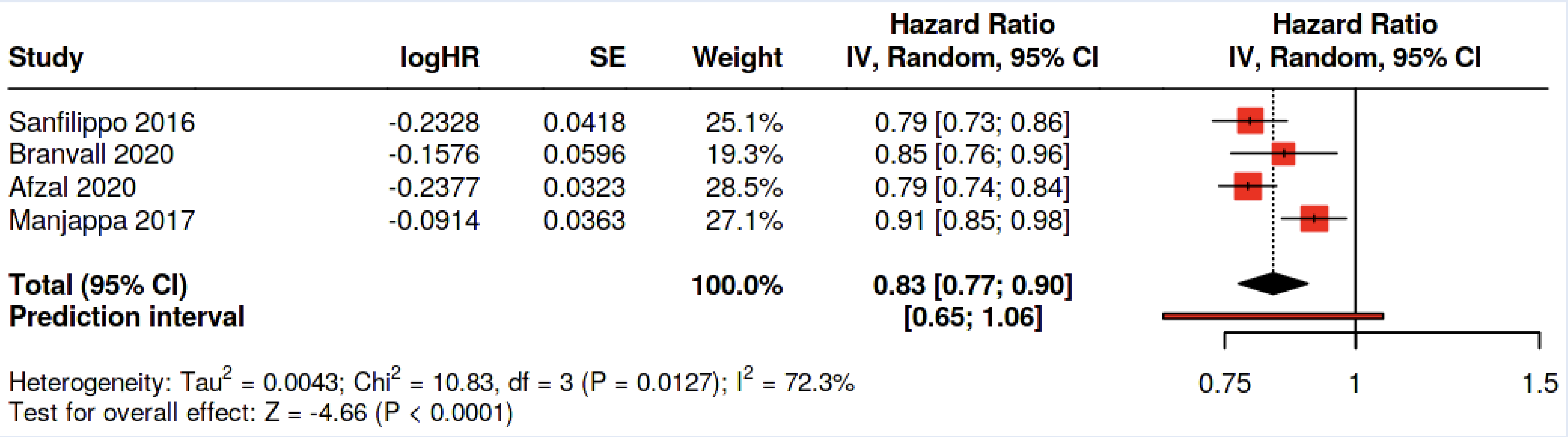


Figure 1. Forest plot of the association between statin exposure and all-cause mortality in patients with multiple myeloma.

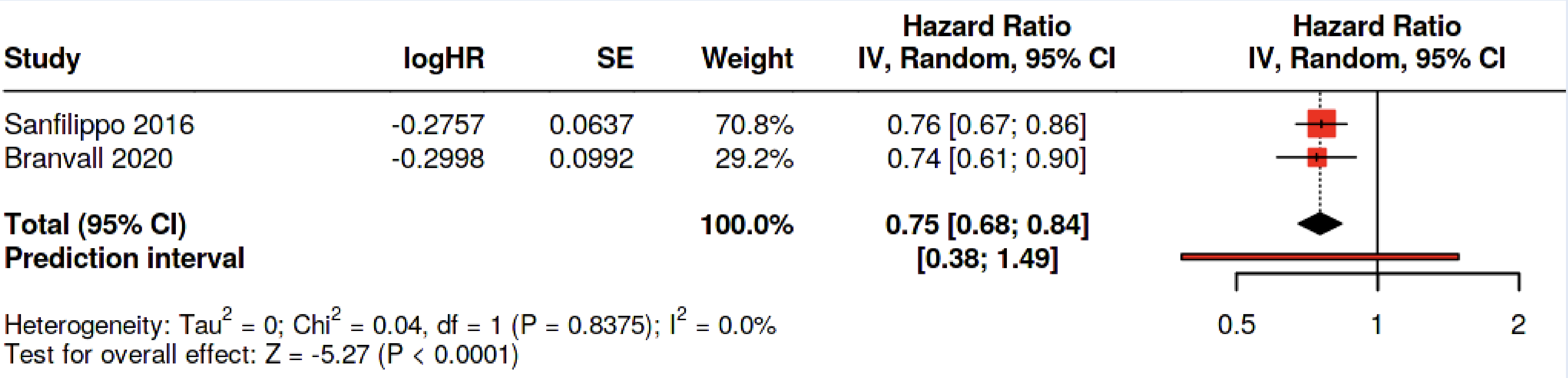


Figure 2. Forest plot of the association between statin exposure and multiple myeloma (MM)-specific mortality.

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