

EFFICACY OF BRAF INHIBITORS PLUS RITUXIMAB IN RELAPSED OR REFRACTORY HAIRY CELL LEUKEMIA: A SYSTEMATIC REVIEW AND META-ANALYSIS.

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INTRODUCTION

Hairy cell leukemia (HCL) is an indolent B-cell neoplasm driven by the *BRAF* V600E mutation. While purine analogs show high initial efficacy, up to 58% of patients relapse, facing cumulative myelotoxicity. Single-agent BRAF inhibitors yield a 91% overall response rate in relapsed or refractory HCL, but complete responses are rare and universally MRD-positive. Combining BRAF inhibitors with rituximab increases the complete response rate to 87%, achieving 60% MRD negativity rate. However, data are limited to small, single-arm studies.

AIM

This meta-analysis evaluates the efficacy and safety of BRAF inhibitors plus rituximab in relapsed or refractory HCL, focusing on survival outcomes, response rates, and adverse events.

METHOD

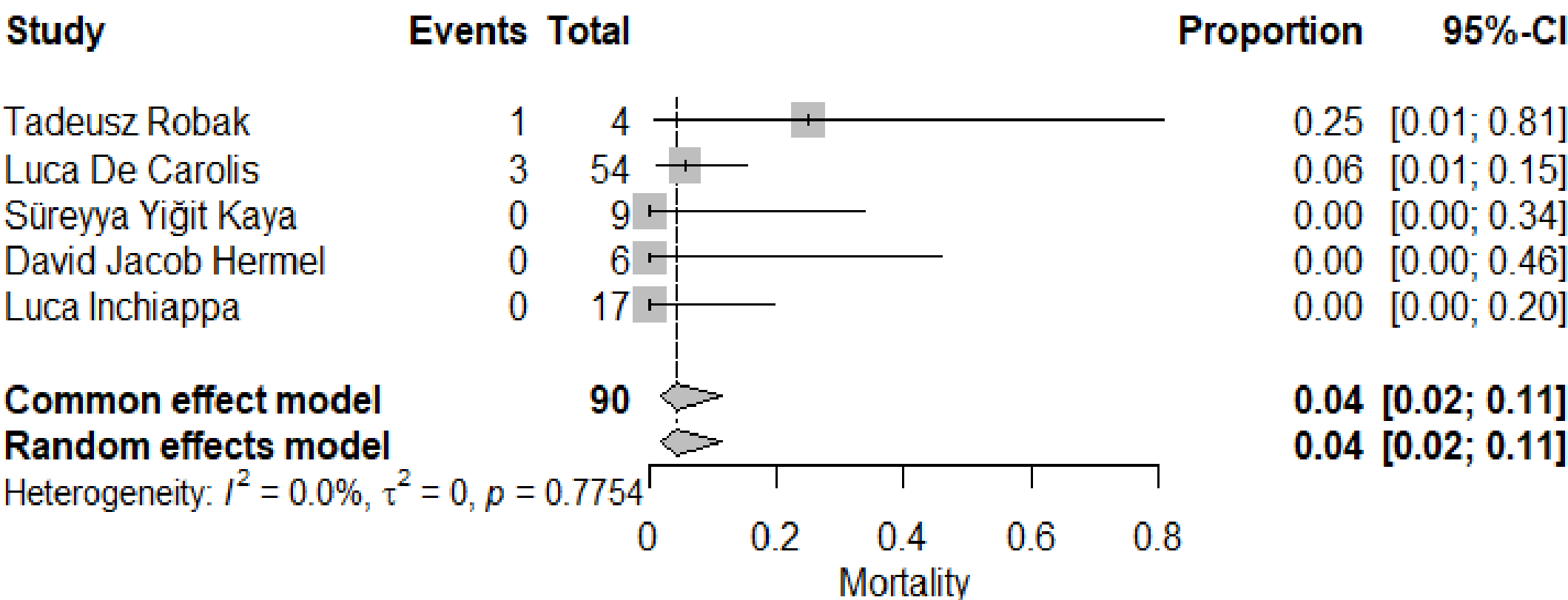
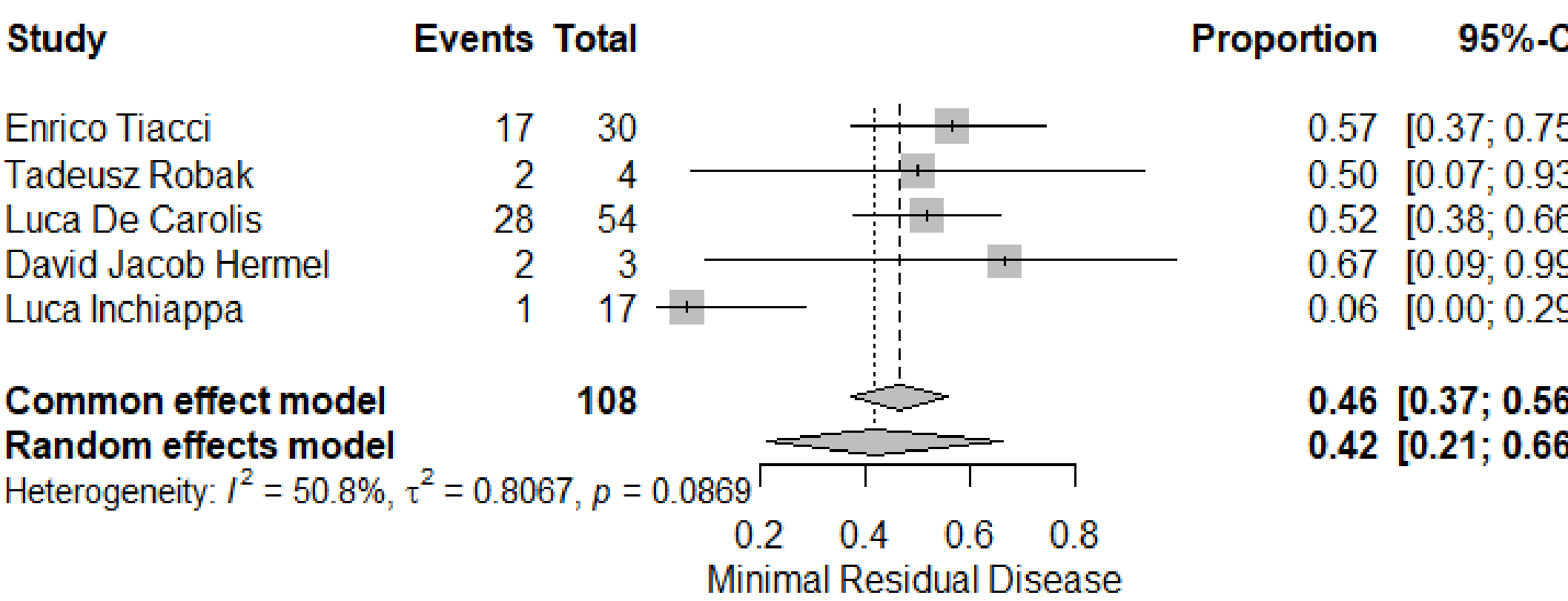
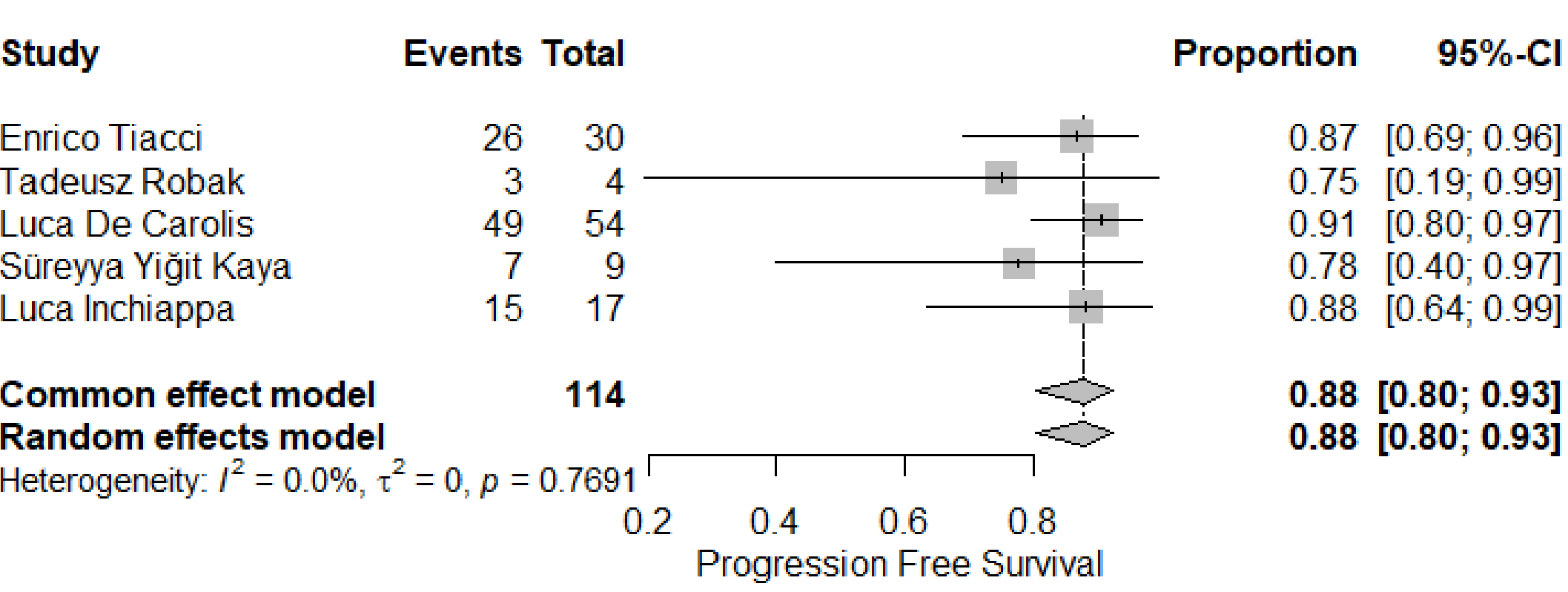
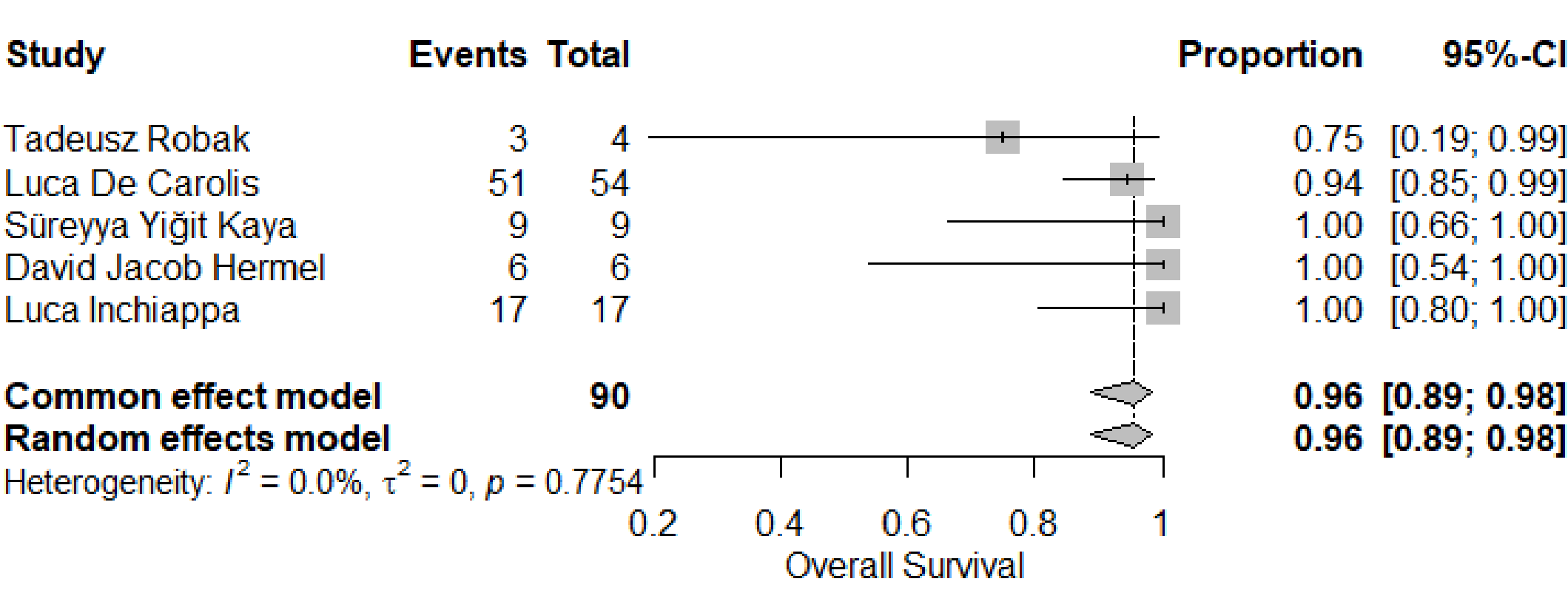
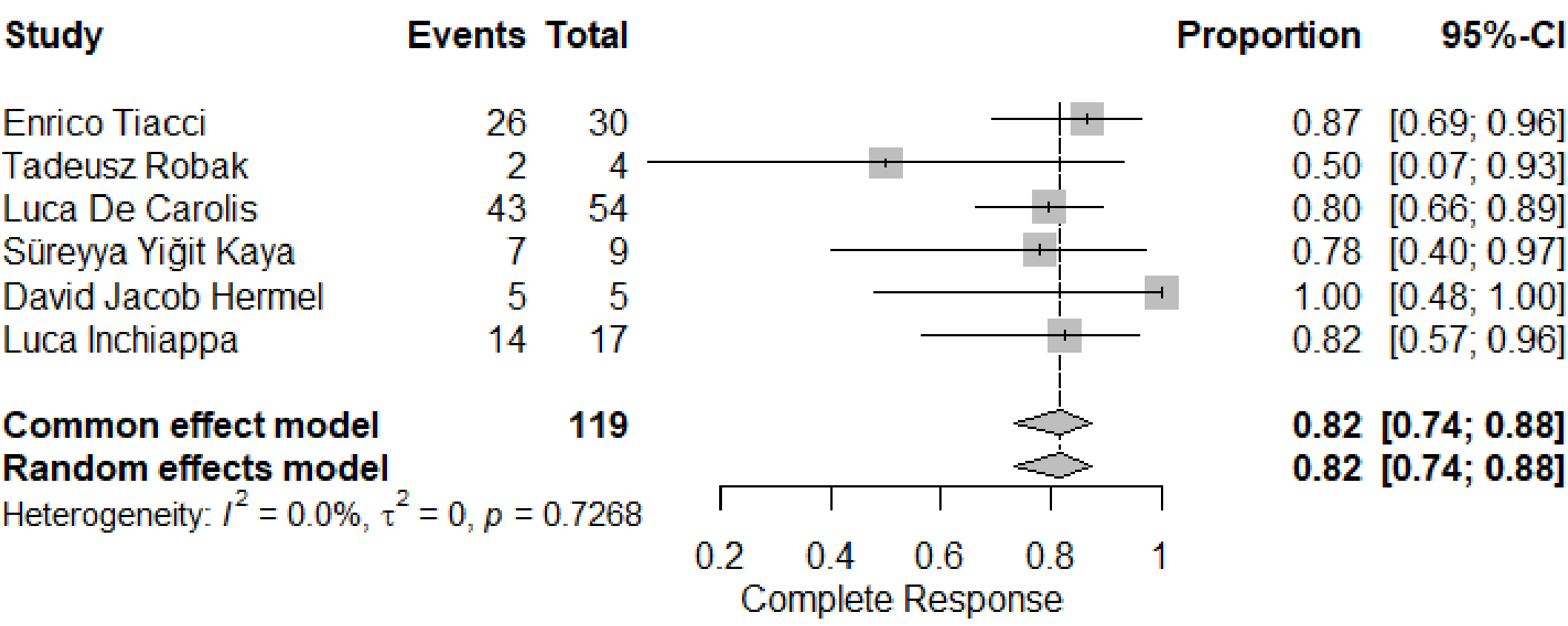
This meta-analysis was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. An extensive search was conducted in major medical databases, including PubMed, Google Scholar, and ScienceDirect for relevant studies concerning BRAF inhibitor plus rituximab combination regimens in patients with relapsed or refractory HCL. Statistical analysis was performed in RStudio using the meta and metafor packages. Pooled effect estimates were calculated for survival outcomes, response rate and MRD negativity, and heterogeneity was assessed using the *I*² statistic.

CONCLUSIONS

BRAF inhibitors combined with rituximab demonstrate high efficacy in relapsed or refractory hairy cell leukemia, yielding high complete response rates and durable survival outcomes. This regimen serves as a potent, low-mortality salvage strategy for patients failing initial purine analog therapy.

RESULTS

Six studies involving a total of 119 patients were included in the meta-analysis. The pooled complete response rate was 82% (95% CI, 0.74–0.88), while the MRD negativity rate was 42% (95% CI, 0.21–0.66; *I*²=50.8%). Overall survival was 96% (95% CI, 0.89–0.98), progression-free survival was 88% (95% CI, 0.80–0.93), and the mortality rate was 4% (95% CI, 0.02–0.11). Statistical heterogeneity (*I*²) remained at 0.0% for all outcomes except MRD negativity.



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