



P3.320: A Meta-Analysis of the Impact of Prophylactic Cranial Irradiation in Patients With Limited-Stage Small Cell Lung Cancer in the MRI Staging Era

Shaoli Li¹, Xin Zheng¹, Yinnan Meng¹, Gang Chen¹, Caining Zhao¹, Sijin Zhong¹, Huixia Li¹, Rui Bai², Ying Dong^{2,*}, Feng-Ming (Spring) Kong^{1,*}
¹LKS Faculty of Medicine, the University of Hong Kong, Hong Kong/HK ²the Second Affiliated Hospital, Zhejiang University School of Medicine, Hang Zhou/CN
Correspondence: Feng-Ming (Spring) Kong, Email: kong0001@hku.hk; Ying Dong, Email: dongying74@zju.edu.cn



IASLC 2026 World
Conference on Lung Cancer
SEPTEMBER 12 – 15, 2026
SEOUL, REPUBLIC OF KOREA

INTRODUCTION

While prophylactic cranial irradiation (PCI) is used in limited-stage small cell lung cancer (LS-SCLC), its efficacy for patients without brain metastases (BM) confirmed by pre-PCI magnetic resonance imaging (MRI) is not well established. This meta-analysis aimed to evaluate the benefit of PCI in this defined subgroup specifically.

METHODS

This meta-analysis followed a systematic literature search of PubMed, Embase, and Cochrane Library to identify studies evaluating PCI in patients with LS-SCLC undergoing pre-PCI MRI. The literature search was conducted on September 23, 2025, and summary data were extracted. Pooled hazard ratio (HR) with 95% confidence interval (CI) was calculated for overall survival (OS), progression-free survival (PFS), and brain metastasis-free survival (BMFS) using common-effects or random-effects models. Risk ratio (RR) with 95% CI was used to estimate the rate of BM.

DISCUSSION AND CONCLUSION

Actionable Take Away Message

- The present meta-analysis indicates that PCI significantly improves survival in LS-SCLC patients with brain MRI staging.
- The associated neurocognitive risks appear limited, which supports its clinical utility.

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The author(s) declare that no artificial intelligence (AI) tools were utilized in the development or creation of this educational material.

RESULTS

- Eleven studies with 1894 patients were eligible for this meta-analysis.
- PCI significantly improved OS (HR = 0.69, 95% CI: 0.61-0.78), PFS (HR = 0.71, 95% CI: 0.60-0.84), and BMFS (HR = 0.53, 95% CI: 0.32-0.88) in patients with LS-SCLC, while also reducing the rate of BM (HR = 0.64, 95% CI: 0.53-0.77).
- Available data, though limited, suggest that neurocognitive adverse events associated with PCI are largely limited and transient.
- Furthermore, PCI maintained a survival advantage in OS over regular MRI surveillance alone. Subgroup analyses identified study design and MRI examination protocol as potential sources of heterogeneity among the included studies.

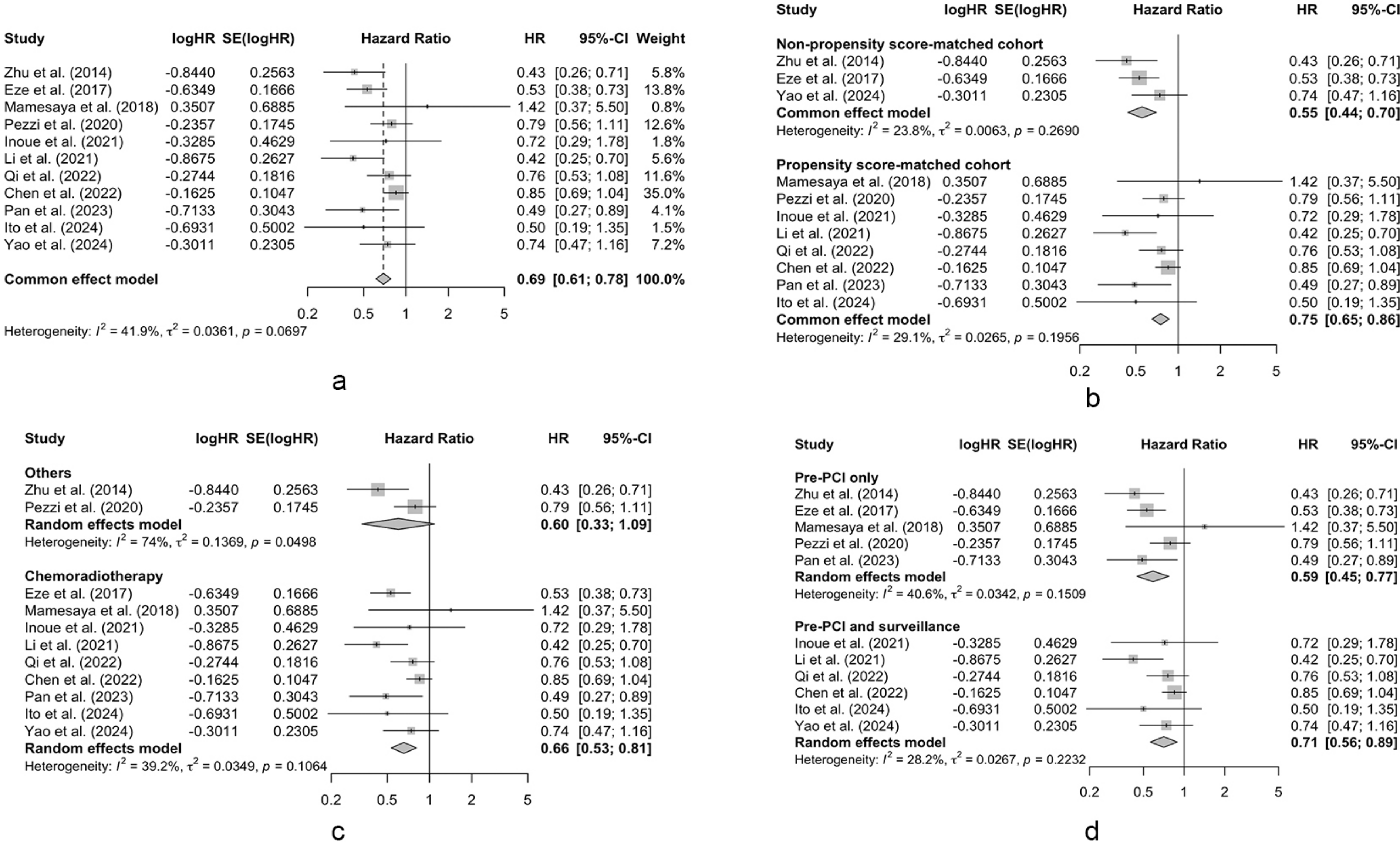


Figure 1. Forest plots for overall survival (OS). This figure shows the pooled hazard ratios (HRs) for: (a) PCI vs. no PCI; (b) subgroup by study design; (c) subgroup by initial treatment; and (d) subgroup by MRI protocol.

Abbreviation: HR: hazard ratio; OS: Overall Survival; PCI: Prophylactic Cranial Irradiation; MRI: Magnetic Resonance Imaging