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Lung

Cost-effectiveness of prophylactic cranial irradiation in stage III non-small cell lung cancer

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INTRODUCTION

In stage III non-small cell lung cancer (NSCLC), prophylactic cranial irradiation (PCI) reduces the brain metastases incidence and prolongs the progression-free survival without improving overall survival. PCI increases the risk of toxicity and is currently not adopted in routine care. Our objective was to assess the cost-effectiveness of PCI compared with no PCI in stage III NSCLC from a Dutch societal perspective.

METHODS

A cohort partitioned survival model was developed based on individual patient data from three randomised phase III trials (N=670). Quality-adjusted life years (QALYs) and costs were estimated over a lifetime time horizon. A willingness-to-pay (WTP) threshold of €80,000 per QALY was adopted. Sensitivity and scenario analyses were performed to address parameter uncertainty and to explore what parameters had the greatest impact on the cost-effectiveness results.

RESULTS

PCI was more effective and costly (0.443 QALYs, €10,123) than no PCI, resulting in an incremental cost-effectiveness ratio (ICER) of €22,843 per QALY gained. The probability of PCI being cost-effective at a WTP threshold of €80,000 per QALY was 93%. The probability of PCI gaining three and six additional months of life were 76% and 56%. The scenario analysis adding durvalumab increased the ICER to €35,159 per QALY gained. Using alternative survival distributions had little impact on the ICER. Assuming fewer PCI fractions and excluding indirect costs decreased the ICER to €18,263 and €5,554 per QALY gained.

CONCLUSION

PCI is cost-effective compared to no PCI in stage III NSCLC, and could therefore, from a cost-effectiveness perspective, be considered in routine care.