

ABSTRACT

Cost-effectiveness analysis of the combination of low-dose nivolumab with triple metronomic chemotherapy for advanced head and neck squamous cell carcinoma in China

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Objective: The combination of low-dose nivolumab with triple metronomic chemotherapy (TMC-I) proposes a novel approach, potentially enhancing patient prognosis while mitigating financial barriers. The purpose of this study was to compare the cost-effectiveness of TMC-I compared to triple metronomic chemotherapy (TMC) in the treatment of advanced head and neck squamous cell carcinoma (HNSCC) patients in China, the largest developing country.

Methods: A partitioned survival model (PSM) was developed based on a randomized clinical trial from the perspective of Chinese health care system. Costs and utility were derived from open-access databases and literatures. A 5% annual discount rate was applied to both costs and outcomes. The primary outcome was incremental cost-effectiveness ratio (ICER). A willingness-to-pay (WTP) threshold of ¥44,679/QALY based on supply-side and ¥134,037/QALY based on demand-side were set. Sensitivity analyses including one-way sensitivity analysis, probabilistic sensitivity analysis and scenario analysis were conducted to test the model stability; subgroup analyses were also included.

Results: TMC-I yielded an additional 0.41 quality-adjusted life years (QALYs) while increasing costs by ¥47,346.98 relative to TMC, leading an ICER of ¥116,374.22/QALY. Sensitivity analysis showed that utility of progression-free survival (PFS) had the greatest impact on results. In scenario analysis which the utilities calculated by the time-to-death (TTD) were adopted, the results showed that the ICER was ¥114,795.25/QALY. In the probabilistic sensitivity analysis, the probabilities that TMC-I was cost-effective at thresholds of ¥134,037/QALY, ¥44,679/QALY gained were 60.9%, 9.4%, respectively. Subgroup analysis results indicated TMC-I was dominated vs. TMC for patients with no previous taxane and PD-L1 score > 50.

Conclusion: For Patients with recurrent or newly diagnosed advanced head and neck squamous cell carcinoma, TMC-I is cost-effective at a WTP thresholds of ¥134,037/QALY and is not cost-effective when the WTP thresholds was ¥44,679/QALY compared with TMC.

Key words: cost-effectiveness, low-dose nivolumab, triple metronomic chemotherapy, head and neck squamous cell carcinoma

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