ISPOR Europe, Nov 6-9, 2022, Vienna, Austria

EE209

Cost-effectiveness analysis of atezolizumab as adjuvant treatment in adult patients following complete resection and platinum-based chemotherapy with non-small cell lung cancer (NSCLC) in Finland

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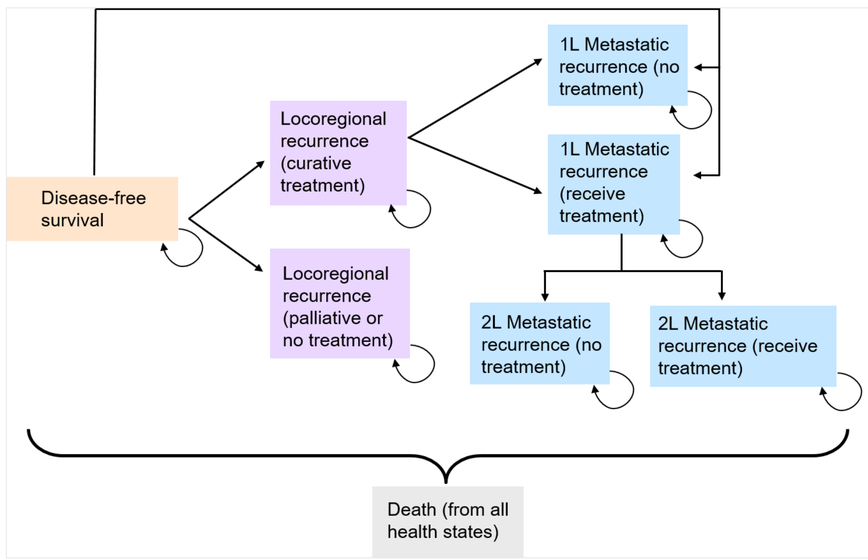
Background

- Lung cancer is the leading cause of cancer death worldwide. Non-small cell lung cancer (NSCLC) accounts for approximately 85% of all lung cancers. Surgery is the standard of care for stages I and II and also several cases of stage IIIA NSCLC.[1] Platinum-based combination chemotherapy is an option for certain early-stage NSCLC patients (stage IB [tumour ≥4 cm] to IIIA)[2,3] following complete resection in, resulting in 4-5% improvement in survival versus observation.[4,5] In early-stage NSCLC novel adjuvant treatments are needed to improve the outcomes of patients.
- The randomised, phase 3, open-label IMpower010 study showed that adjuvant immunotherapy with atezolizumab (ATZ) after platinum-based chemotherapy improved disease-free survival (DFS) compared to best supportive care (BSC) in adult patients with resectable stage II to IIIA[a] NSCLC. The safety profile was consistent with that previously reported with ATZ monotherapy.[6,7]
- In the PD-L1 TC ≥50% population there was a 57% reduction in risk of disease recurrence or death for adjuvant ATZ over BSC (DFS HR 0.43 (95% Confidence Interval 0.27,0.68)).[8] At the first OS interim analysis, there was a clinically meaningful improvement.[9]

Objectives and Methods

- The objective of the study was to assess the cost-effectiveness of ATZ as adjuvant treatment vs. BSC (active monitoring) in adult patients following complete resection and platinum-based chemotherapy with NSCLC with a high risk of recurrence whose tumours have PD-L1 expression on ≥ 50% of tumour cells and who do not have EGFR mutant or ALK-positive NSCLC from the Finnish healthcare payer perspective.
- A Markov Model was developed to estimate the costs and benefits of adjuvant ATZ versus BSC using a 30-year time horizon. The model used data from IMpower010 (clinical cut-off date January, 2021) to model disease-free survival (DFS), adjuvant ATZ treatment duration, disease recurrence patterns and adverse events. The information on utilities and clinical parameters related to advanced disease stages were derived from IMpower150 and IMpower110 trials and from the literature.
- The assumptions in the model (e.g. healthcare resource use) were validated with the assistance of Finnish therapeutic area experts. Wholesale prices (May, 2022) were utilized for treatment costs. Healthcare resource use data was sourced from public Finnish hospital price lists and publications (indexed to year 2021). Both costs and effects were discounted at 3%.

Figure 1. Model structure



Results

Base case analysis

- The results are presented in Table 1. ATZ is associated with a gain of 1.95 quality-adjusted life-years (QALY) for an additional cost of 58,264 € compared to BSC. The incremental cost-effectiveness ratio (ICER) of the base case analysis is 29,911 €/QALY, with a 30-year time horizon.

Table 1. Results of the base case analysis €/QALY

Costs (€)	ATZ	BSC	Incremental
Total costs	102,657	44,393	58,264
QALYs	8.321	6.373	1.948
ICER (€/QALY)			**29,911**

Scenario analysis

- Several scenario analyses were conducted to assess variability according to the model assumptions (Table 2). Based on the different scenarios, the ICER varied from 21,593 €/QALY to 39,856 €/QALY.

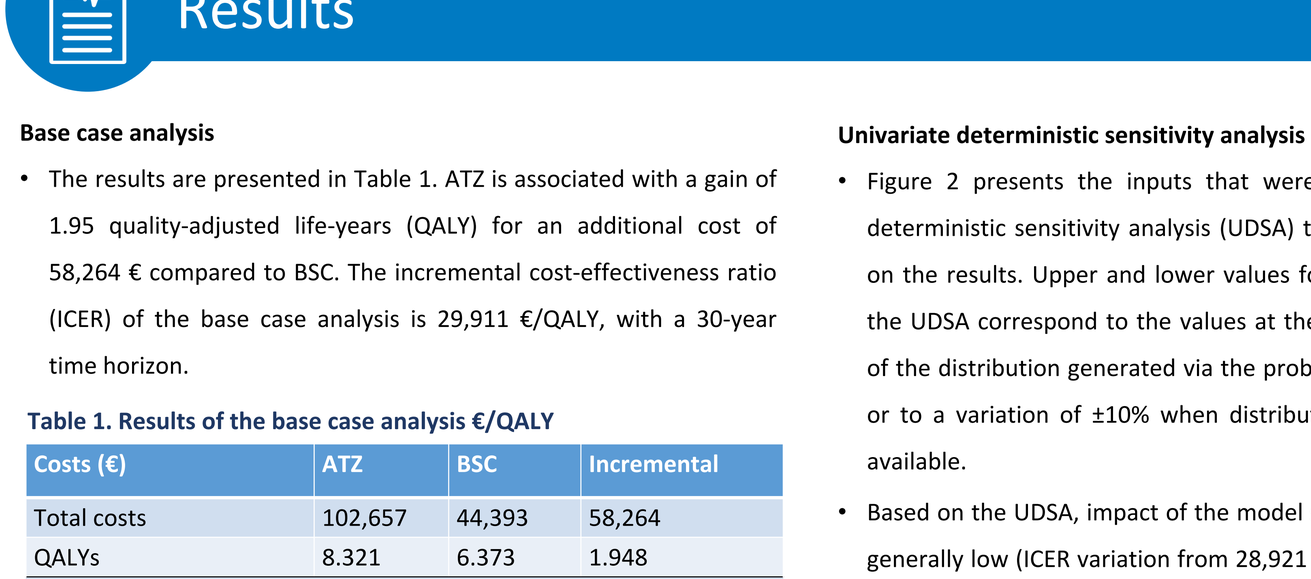
Univariate deterministic sensitivity analysis

- Figure 2 presents the inputs that were identified via univariate deterministic sensitivity analysis (UDSA) to have the highest impact on the results. Upper and lower values for each input tested for in the UDSA correspond to the values at the 90th and 10th percentile of the distribution generated via the probabilistic sensitivity analysis or to a variation of ±10% when distribution parameters were not available.
- Based on the UDSA, impact of the model settings on the results was generally low (ICER variation from 28,921 €/QALY to 30,783 €/QALY) supporting the robustness of the results towards the values set. The model was most sensitive to amount of patients with metastatic recurrence as first event (BSC – arm), utilities while on treatment (DFS) and amount of patients on 1L metastatic treatment.

Table 2. Results of the scenario analyses

Scenario	Parameters (base case value)	ICER, €/QALY
Base Case	-	**29,911**
Time horizon	15 years (30 years)	39,856
Discount rate - Efficacy	0% (3%)	21,593
Discount rate - Costs	0% (3%)	30,045
Extrapolation of DFS	Exponential (Log-logistic)	22,404
Extrapolation of DFS	Log-Normal (Log-logistic)	27,788
Extrapolation of DFS	Gamma (Log-logistic)	28,882
Vial sharing	50% are shared across patients (no vial sharing)	29,717
Treatment costs	-25% discount for all drugs (no discounts)	22,582

Figure 2. Tornado diagram



[a] Stage II–IIIA (TNM 7th edition)/select stage II–IIIB (TNM 8th edition)

Conclusions

- **Atezolizumab, as the first adjuvant immunotherapy treatment for early stage NSCLC provides a significant reduction in risk of recurrence or death compared to BSC.**
- **This health economic analysis found that adjuvant ATZ can be considered a cost-effective treatment from the Finnish healthcare perspective in this patient population.**
- **The robustness of the base case analysis is confirmed by the results of the sensitivity analysis performed.**

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CONFLICTS OF INTEREST

T Männik, M Vuojolainen, and J Laine are employed by Roche Oy. N Jovakoski is employed by F. Hoffmann-La Roche.
A Knuuttila and A Jekunen report personal fees from various pharmaceutical companies outside the submitted work.

FUNDING

The study was funded by Roche Oy.