Poster # EE164

Cost effectiveness analysis of tenecteplase versus alteplase for adults with acute ischaemic stroke (AIS) in Greece

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Introduction

- Globally, stroke is the third leading cause of death and fourth leading cause of disability-adjusted life years (DALYs), therefore, making the economic burden of post-stroke care substantial in relation to formal and informal care.[1-3]
- In Greece, stroke is the second leading cause of death and the second largest cause of complex disability in adults.[4]
- acute ischaemic stroke (AIS) accounts for approximately 70% of all strokes.[5] AIS is defined by the sudden loss of blood flow to an area of the brain resulting in loss of neurologic function.[5] Timely diagnosis and prompt initiation of appropriate treatment are critical factors that significantly impact stroke survival and health outcomes.[5]
- AIS survivors are often left with long-term functional, cognitive and psychological disabilities with substantial impact on caregivers and support services.[1] Depending on the severity of the stroke and its consequences, stroke survivors may need continuous care for their remaining life.[6]
- Boehringer Ingelheim (BI) currently have two medicines indicated for AIS: alteplase (Actilyse®) and tenecteplase (Metalyse®). Alteplase is indicated as the standard of care (SoC) for AIS and recent clinical data suggest that tenecteplase could replace alteplase as the SoC in this indication, as it offers improvements in patient care whilst maintaining efficacy and safety, reducing the overall burden of stroke.
- This study evaluates the cost-effectiveness of tenecteplase versus alteplase in acute ischaemic stroke (AIS) patients who are eligible for intravenous thrombolysis in Greece from the perspective of the third-party payer, namely the National Organization for Healthcare Services Provision (EOPYY).

Methods

- A Markov decision-analytic model prepared for the healthcare system in the UK was localized to the health care setting in Greece to compare tenecteplase versus alteplase in the treatment of AIS.
- The time horizon was configured to span a lifetime duration (26 years) with an annual discount rate of 3.5% for benefits and costs. In the base case, treatment efficacy and quality of life (QoL) data were sourced from the AcT trial.[7]
- Costs included drug acquisition, disease management, and adverse events, at 2024 Euros.
- Health benefits were measured in Life Years (LYs) gained and Quality-Adjusted Life Years (QALYs) gained.
- Incremental cost-effectiveness ratios (ICERs) were calculated at a willingness-to-pay (WTP) threshold of € 54,855/QALY.
- Scenario and sensitivity analyses explored parameter uncertainty.

Results

- Treatment with tenecteplase for a 1000-patient population cohort at a lifetime horizon from the perspective of EOPYY resulted in an additional 44.7 LYs and 22.251 QALYs at an incremental cost of €478,843.
- The ICER was calculated at €10,039/LY gained and €21,520/QALY gained, rendering tenecteplase a highly cost-effective option compared to alteplase.
- In a scenario analysis, where clinical and QoL data were sourced from both the AcT trial and real-world evidence, tenecteplase remained cost-effective with an ICER of €15,896/QALY gained compared with alteplase.
- Deterministic and probabilistic sensitivity analyses confirmed robustness of results, in both scenarios.

Key take aways

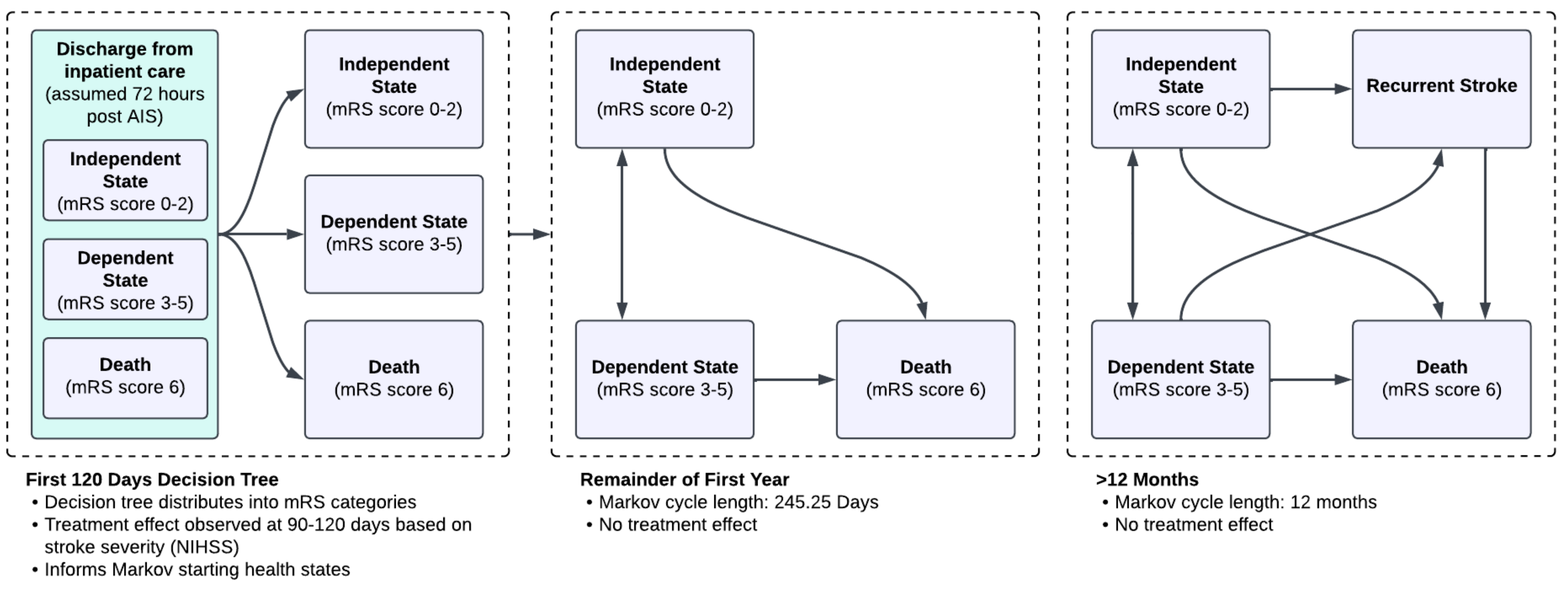
Treatment with tenecteplase in AIS patients who are eligible for thrombolysis offers additional LYs and QALYs compared to alteplase at a lifetime horizon and is highly cost-effective from the perspective of the third-party payer in Greece.

In the base case analysis, and with an ICER of €21,520 per QALY, tenecteplase is shown to be a very cost-effective option in comparison to alteplase, well below the estimated €54,855 per QALY WTP threshold.

In the scenario analysis, tenecteplase remains cost-effective with an ICER of €15,896 per QALY compared with alteplase. Tenecteplase shows greater incremental LYs and QALYs in this scenario compared to the base case, as well as higher total costs.

Deterministic and probabilistic sensitivity analyses confirmed robustness of results, in both scenarios

Figure 1: Model flow



First 120 Days Decision Tree
- Decision tree distributes into mRS categories
- Treatment effect observed at 90-120 days based on stroke severity (NIHSS)
- Informs Markov starting health states

Remainder of First Year
- Markov cycle length: 245.25 Days
- No treatment effect

>12 Months
- Markov cycle length: 12 months
- No treatment effect

Table 1: Summary base case cohort-level results (base-case based on 1,000 patient population at lifetime horizon from healthcare payer (EOPYY) perspective)

Outcome	Tenecteplase	Alteplase	Incremental (TNK vs ALT)
Total Costs	€38,675,347	€38,196,504	€478,843
QALYs	3086.757	3064.506	22.251
LYs	6358.217	6310.517	47.700
ICER (cost/QALY)			€21,520
ICER (cost/life year)			€10,039
Cost Breakdown:			
Health states	€37,587,624.90	€37,295,166.34	€292,458.56
Thrombolysis (drug costs)	€741,770.00	€555,280.00	€186,490.00
72 Hour Period AIS resource use costs	€337,910.00	€337,910.00	€0.00
Adverse event costs (ICH)	€8,042.08	€8,148.00	-€105.92
QALY Breakdown:			
Independent (mRS score 0-2)	536.596	531.539	5.056
Dependant (mRS score 3-5)	2017.998	2004.834	13.164
Recurrent stroke	532.163	528.133	4.030

Abbreviations: TNK: tenecteplase; ALT: alteplase; AIS: acute ischaemic stroke; QALY: quality-adjusted life year; mRS: modified Rankin score

Figure 2: Tenecteplase versus alteplase

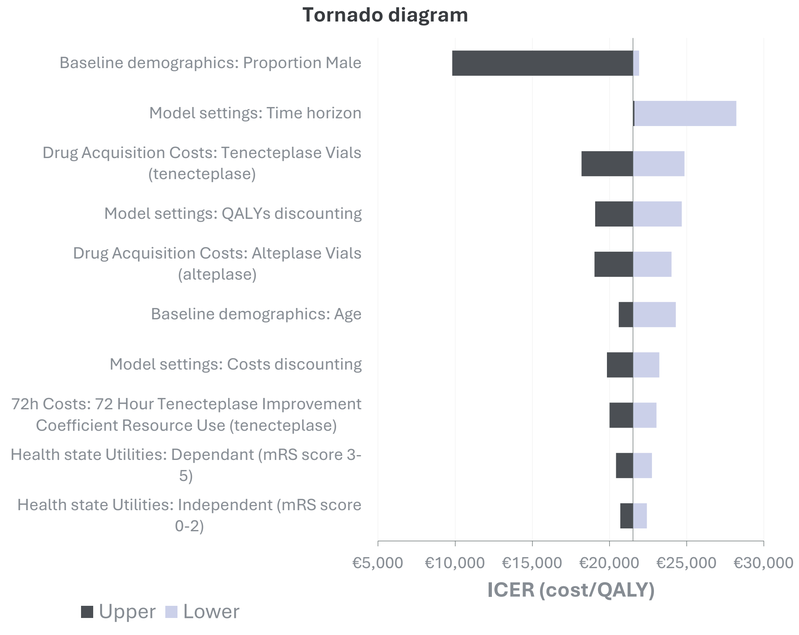


Figure 3: Difference in QALYs, tenecteplase versus alteplase

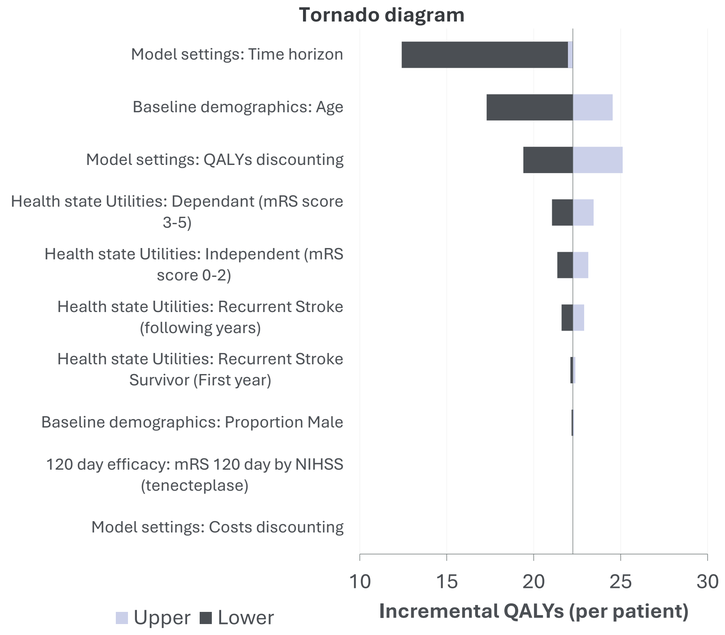


Table 2: Estimated base case cohort-level [based on 1,000 patient population at lifetime horizon from healthcare payer (EOPYY) perspective] outcomes at 120 days following AIS onset

Outcome	Tenecteplase	Alteplase	Incremental (TNK vs ALT)
Total Costs	€2,734,176	€2,532,926	€201,250
Total QALYs	156.4109	155.3744	1.0365
Total LYs	249.9654	248.0220	1.9434
Cost Breakdown:			
Health states	€1,646,454	€1,631,588	€14,866
Thrombolysis (drug costs)	€742	€555	€186
72 Hour Period AIS resource use costs	€337,910	€337,910	€0
Adverse event costs (ICH)	€8,042	€8,148	-€106
QALY Breakdown:			
Independent (mRS score 0-2)	126.2605	125.6481	0.6125
Dependant (mRS score 3-5)	30.1504	29.7264	0.4240

Abbreviations: TNK: tenecteplase; ALT: alteplase; AIS: acute ischaemic stroke; QALY: quality-adjusted life year; LY: life year; mRS: modified Rankin score

Please note: these outputs are a snapshot presented in parallel to the full model outputs as 'estimates' of the results calculated at the 120-day trial endpoint time point - the decision tree values used within the full model structure include half cycle correction and have discounting applied.

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Disclosure:
- *The authors meet criteria for authorship as recommended by the ICMJE.*
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