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Poster EE361

Cost-Effectiveness Analysis of Ribociclib Versus Abemaciclib in the First-Line (1L) Treatment of Postmenopausal Women With HR+/HER2- Advanced Breast Cancer (ABC)

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KEY FINDINGS & CONCLUSIONS

- RIB+AI was estimated to be the dominant treatment option (both cost-saving and cost-effective) compared to ABE+AI in HR+/HER2− post-menopausal women with advanced breast cancer in 1L setting from the UK payer perspective.
- The cost savings were largely due to linear pack pricing for RIB compared to flat pack pricing for ABE which led to lower treatment cost per patient following dose reductions.

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BACKGROUND

- Combination of a cyclin-dependent kinase 4 and 6 (CDK4/6) inhibitor and an aromatase inhibitor (AI) is the standard of care in first-line (1L) setting of hormone receptor-positive (HR+) and human epidermal growth factor receptor 2-negative (HER2−) advanced breast cancer (ABC). Ribociclib (RIB) and Abemaciclib (ABE) are both CDK4/6 inhibitors that have demonstrated clinical efficacy in separate randomised clinical trials.
- RIB+AI demonstrated both significant and clinically meaningful improvement in progression free survival (PFS) as well as final overall survival (OS) compared to placebo (PBO)+AI in its pivotal phase III clinical trial, MONALEESA 2[1].
- MONARCH 3 assessing ABE+AI[2,3] has demonstrated significant PFS benefits compared to PBO+AI while final OS data for ABE+AI is pending and statistically insignificant thus far.
- In absence of head-to-head data, an anchored Matching-Adjusted Indirect Comparison (MAIC) of RIB+ AI vs ABE+ AI on Quality of Life (QoL) was performed using data from EORTC QLQ-C30 and BR-23 questionnaires which indicated that RIB+ AI is associated with better symptom-related QoL compared with ABE+ AI in 1L treatment of postmenopausal women with HR+/HER2- ABC[4].
- **Objective:** The objective of this study was to determine the cost effectiveness of RIB+AI versus ABE+AI for 1L treatment of postmenopausal women with HR+/HER2 ABC from the UK National Health Service perspective.

METHODS

- A cohort-based three-state (progression-free, progressed disease, and death) partitioned survival model (shown in **Figure 1**) was developed with a cycle length of 1-month over a lifetime horizon of 40 years.
- Starting age of the cohort was 62 years [5] and the discount rate for both effects and costs was 3.5% per annum.
- Survival probabilities for RIB+AI and ABE+AI were derived by applying a hazard ratio (HR) to the reference arm (PBO+AI) modelled by fitting parametric models to PFS and OS data for PBO+AI in MONALEESA-2[5].
- There are no head-to-head data available for RIB versus ABE, therefore HRs for RIB+AI versus PBO+AI were derived using a MAIC[4]. For ABE+AI versus PBO+AI, HRs were taken from published literature (**Table 1**)[2,3].
- UK specific cost inputs such as drug acquisition, disease monitoring, subsequent therapies, and adverse event costs were obtained from publicly available sources[6-8]. Frequency of resource use and proportion of patients on subsequent therapies were taken from published literature.
- Drug costs were calculated based on time-to-treatment discontinuation curves. Relative dose intensity was accounted in ABE costs while RIB costs were estimated using distribution of patients across varying doses of RIB.
- Health state utility in pre-progression state was derived from EQ-5D data of MONALEESA-2 while post-progression utility was taken from published literature[9]. Utility values were assumed similar between treatments (**Table 1**).
- One-way and probabilistic sensitivity analyses were performed to account for uncertainty associated with model parameters.

Figure 1. Model structure

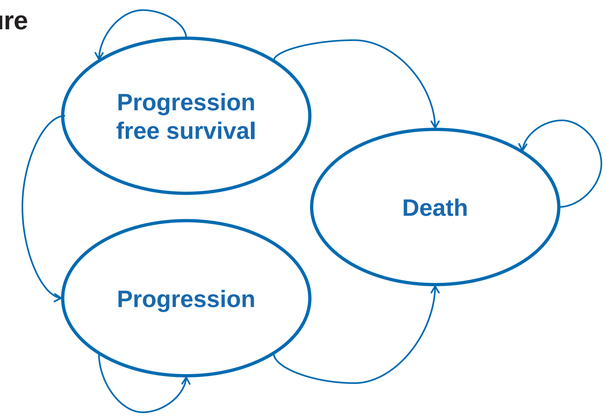


Table 1. Key model input

Model parameters	RIB+AI	ABE+AI
Clinical efficacy		
HR for PFS, mean (95% CI)[a]	0.493 (0.385-0.631)	0.525 (0.415-0.665)
HR for OS, mean (95% CI)[a]	0.679 (0.517-0.892)	0.754 (0.584-0.974)
Utility values		
PF (SD)	0.8134 (0.00658)	
PD (SD)	0.68 (0.068)	
Costs (mean monthly)		
Drug acquisition	£3,209/ £2,140/ £1,071[b]	£2,760

[a]HR of RIB+AI vs AI reported is post MAIC while the HR for ABE+AI vs AI taken from MONARCH-3 trial;
[b]Based on 600 mg / 400 mg / 200 mg doses.
CI, confidence interval; HR, hazard ratio; OS, overall survival; ABE, abemaciclib; PD, progressed disease; PF, progression-free; PFS, progression-free survival; RIB, ribociclib; SD, standard deviation; AI, aromatase inhibitor.

RESULTS

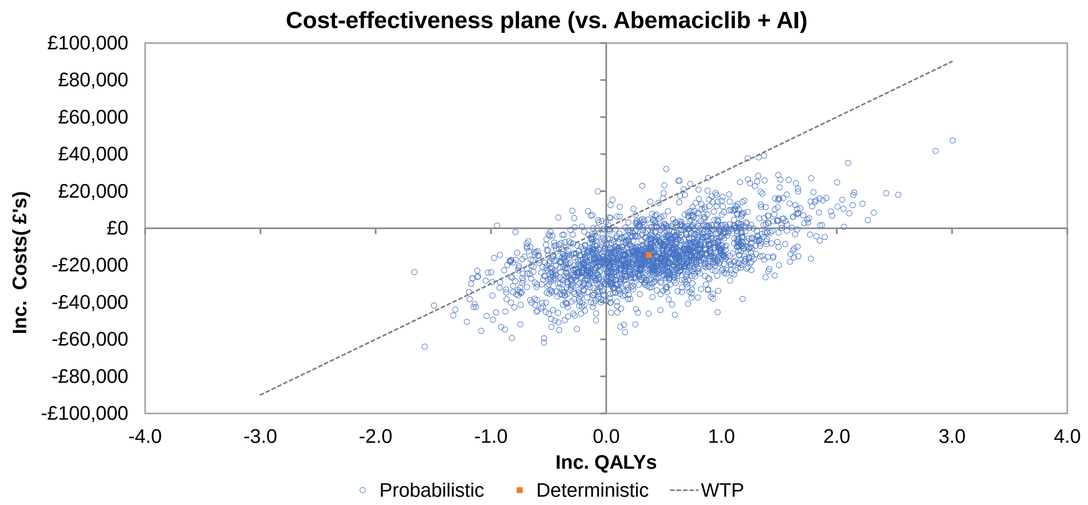
- The results of the cost-effectiveness analysis demonstrated that RIB+AI dominated ABE+AI. RIB+AI provided cost savings of £14,470 while having +0.370 additional quality adjusted life years (QALY) per patient compared to ABE+AI.
- In probabilistic sensitivity analysis, RIB+AI was cost-effective against ABE+AI in 94% of the simulations at willingness to pay threshold of £30,000 per QALY (shown in **Table 2** and **Figure 2**).
- In one-way sensitivity analysis, utilities were varied by its standard deviation, HRs were varied by 95% CI, costs were varied by ±10% of the expected value. In all scenarios, results indicated RIB+AI being cost-effective compared to ABE+AI. HR for PFS and OS were key value drivers of cost-effectiveness (shown in **Figure 3**).

Table 2. Deterministic and probabilistic analyses results

Treatment	Total Costs	Total QALYs	Inc. costs	Inc. QALYs	ICER
Deterministic results					
RIB+AI	£134,012	5.471	-£14,470	0.370	RIB is dominant
ABE+AI	£148,482	5.101			
Probabilistic results					
RIB+AI	£137,261	5.644	-£14,390	0.394	RIB is dominant
ABE+AI	£151,652	5.249			

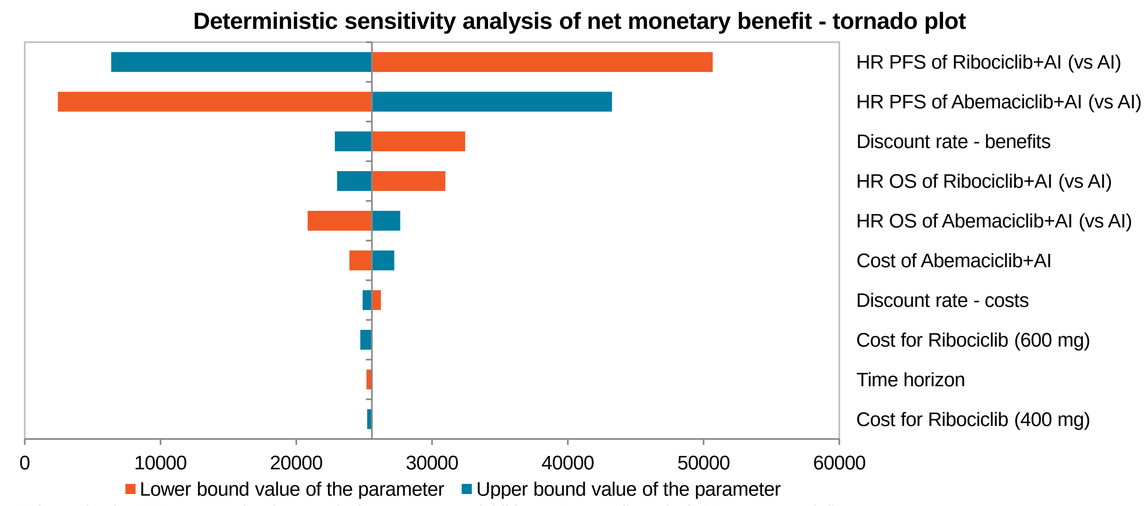
ICER, incremental cost-effectiveness ratio; Inc., Incremental; Lys, life years; QALYs, quality-adjusted life years; RIB, ribociclib; ABE, abemaciclib; AI, aromatase inhibitor.

Figure 2. Scatterplot generated in the probabilistic sensitivity analysis



AI, aromatase Inhibitor; Inc. Costs, Incremental costs; Inc. QALYs, Incremental quality-adjusted life years; WTP, willingness to pay.

Figure 3.Tornado plot of net monetary benefits in one-way sensitivity analysis



HR, hazard ratio; PFS, progression-free survival; AI, aromatase inhibitor; OS, overall survival; PD, progressed disease.

Limitations

- While the analysis utilized final data cut-off of MONALEESA-2, only second interim summary data were available from MONARCH-3. Further, observed HRs were used from MONARCH-3, whereas a population matched estimate of HR was used for MONALESSA-2.
- Due to lack of data availability, the analysis assumed same utility values across treatment groups.

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Disclosures

DCa reports conflict of interest from Pfizer, Lilly, grants from Novartis unrelated to this study, during the conduct of the study; VS and CB are employees of Novartis Healthcare Pvt. Ltd., Hyderabad, India; CC is an employee of Novartis Pharmaceuticals UK Limited, London, UK; DCh and PP are employees of Novartis Services Inc, East Hanover, NJ, USA

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