

A Comparison of Treatment Costs for CDK4/6 Inhibitors in Patients With HR+/HER2- Early Breast Cancer in Sweden



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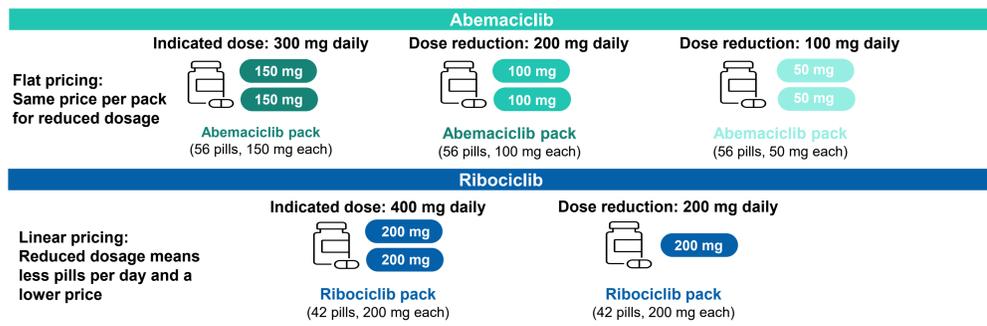
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INTRODUCTION

- To date, two cyclin-dependent kinase 4/6 (CDK4/6) inhibitors have been approved in the early breast cancer (EBC) setting; these treatments offer new therapeutic options along with anticipated impacts on treatment costs¹⁻⁴
- Ribociclib in combination with an aromatase inhibitor is indicated as adjuvant treatment for patients with hormone receptor-positive/human epidermal growth factor receptor 2-negative (HR+/HER2-) EBC with high risk of recurrence^{1,2}
- Abemaciclib in combination with endocrine therapy is indicated as adjuvant treatment for patients with node-positive HR+/HER2- EBC with high risk of recurrence^{3,4}
- Differences between these treatments that impact costs include the duration of therapy (ribociclib: 3 years; abemaciclib: 2 years), dosing regimen (ribociclib: 3 weeks on/1 week off in 28-day cycles; abemaciclib: 28 consecutive days), and type of pricing⁵⁻⁸
- Dose reduction with ribociclib involves receiving fewer tablets of the same strength, while reducing abemaciclib dosage requires taking the same number of tablets at a weaker strength (Figure 1)
 - Ribociclib is offered with linear pricing, in which the total cost of the drug is directly proportional to the quantity of the drug dispensed. This allows for a reduced drug cost with reduced dosing⁷
 - Abemaciclib is offered with flat pricing, in which the cost of the drug remains the same regardless of the strength of the tablets. With this type of pricing, dose reductions do not impact drug costs⁸
- Here, we estimate the treatment cost of adjuvant ribociclib vs abemaciclib for patients with EBC in Sweden, considering relative dose intensity (RDI) and reported mean time on treatment (ToT)

Figure 1. Summary of Abemaciclib and Ribociclib Dosing and Pricing



METHODS

- The modeling approach used to calculate the treatment cost of ribociclib and abemaciclib is based on mean ToT, prescribed dose adjusted for RDI, and cost per 28-day pack in Swedish kronor (kr) (Figure 2)
 - Mean ToT, derived from time to discontinuation, is defined as the average duration of time that patients remained on adjuvant CDK4/6 inhibitor treatment, measured from the first dose until permanent discontinuation for any reason (such as death, treatment discontinuation, and disease recurrence)
 - RDI is calculated as the percent of the actual dose of CDK4/6 inhibitor a patient received compared with the planned protocol-specified dose intensity. Due to the flat pricing model for abemaciclib, a reduced dose does not change the price of treatment. In this analysis, abemaciclib RDI was set from a cost perspective and not based on the average dose received by patients
 - Pricing of each drug was incorporated into the calculations: ribociclib-linear; abemaciclib-flat

Figure 2. Summary of Modeling Approach

Approach	Definition	Key inputs used
ToT × RDI	RDI is applied to the monthly cost for the starting dose of the treatment and multiplied with the mean ToT to determine overall treatment costs	<ul style="list-style-type: none"> Cost inputs RDI for treatments Mean overall ToT

RDI, relative dose intensity; ToT, time on treatment.

Model Inputs

- Ribociclib ToT and RDI were extracted from the NATALEE 4-year landmark analysis; accounting for all dose adjustments and dose interruptions, ribociclib RDI was reported as 83.4% (Table 1)⁹
- Abemaciclib ToT and RDI were derived from the Swedish Dental and Pharmaceutical Benefits Agency submission; abemaciclib RDI was reported as 100%, which was also observed in a submission to the National Institute for Clinical Excellence (NICE, TA810)^{10,11}
- From publicly available Swedish sources (pharmacy selling price, without confidential rebate), the cost per 28-day treatment cycle was kr 14,574 for ribociclib and kr 21,845 for abemaciclib
- Ribociclib dosage for EBC is 400 mg per day, reduced from the 600 mg per day used in metastatic breast cancer
 - Abemaciclib dosing per day is the same for both EBC and metastatic breast cancer
- Mean ToT for ribociclib was 7 months longer compared with that for abemaciclib

Table 1. Key Inputs and Assumptions

Category	Abemaciclib	Ribociclib
Cost per pack	kr 21,845	kr 14,574
Tablet strength	150 mg	200 mg
No. of tablets in pack	56	42
Treatment cycle	2 tablets per day for 28 days	2 tablets per day for 21 days; 7 days off
No. of tablets used per 28-day treatment cycle	56	42
Overall mean ToT ^a	19.25 months	26.50 months
RDI	100%	83.4%

^a One month is imputed as 30.437 days. kr, kronor; RDI, relative dose intensity; ToT, time on treatment.

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KEY FINDINGS & CONCLUSIONS

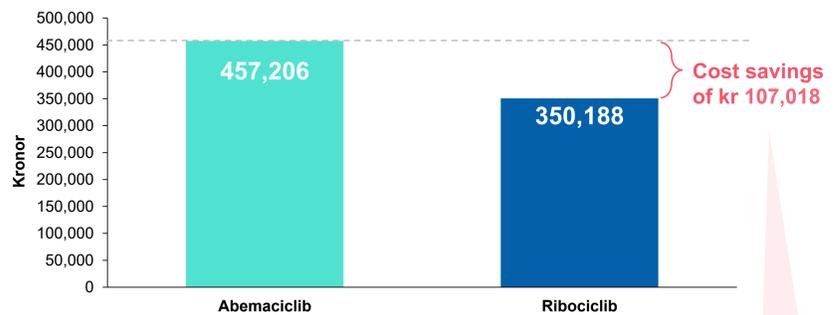
- An RDI-adjusted modeling assessment found that for patients with HR+/HER2- EBC in Sweden, 3-year adjuvant ribociclib treatment was less costly than 2-year abemaciclib treatment
- The model found ribociclib treatment to be 23% less costly than abemaciclib treatment (absolute cost difference of kr 107,018)
- Drug cost savings with ribociclib is attributable to dosing regimen and impact of linear pricing
- Slightly increased resource use for ribociclib had minimal impact on total cost savings (reduced by kr 6,972 to kr 100,046)
- These findings can help further elucidate overall health care costs of adjuvant ribociclib vs abemaciclib and may be considered alongside efficacy and safety in clinical decision-making

RESULTS

Drug Costs

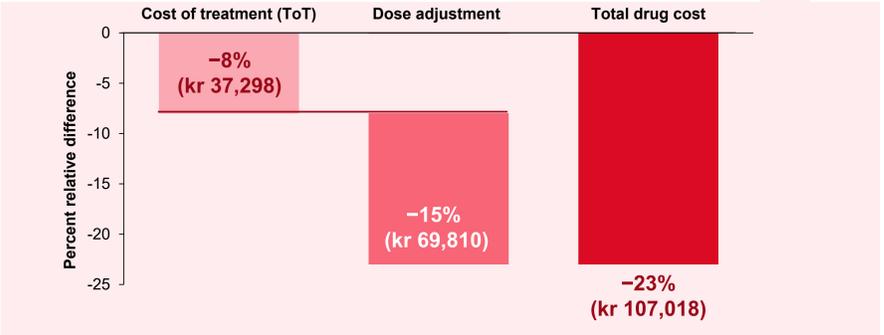
- Drug treatment costs accounting for mean ToT and RDI were kr 350,188 for 3-year adjuvant ribociclib and kr 457,206 for 2-year adjuvant abemaciclib (Figure 3)
- Ribociclib drug cost saving vs abemaciclib was estimated at kr 107,018, on average, per patient
- The model estimated that in Sweden, adjuvant ribociclib results in a 23% drug cost savings relative to abemaciclib (Figure 4)
 - Mean ToT for ribociclib vs abemaciclib accounted for an 8% relative savings costs in favor of ribociclib (lower mean ToT vs indicated treatment duration for both drugs)
 - Mean RDI for ribociclib vs abemaciclib accounted for a 15% relative savings costs in favor of ribociclib
- An alternative approach based on dose reductions and dose holds was also applied to assess the robustness of the results. This yielded similar drug cost savings with 3-year ribociclib vs 2-year abemaciclib

Figure 3. Drug Costs of 2-Year Abemaciclib and 3-Year Ribociclib Treatment for HR+/HER2- EBC in Sweden



EBC, early breast cancer; HR+/HER2-, hormone receptor positive/human epidermal growth factor receptor 2 negative; kr, kronor.

Figure 4. Ribociclib Relative Drug Cost Savings vs Abemaciclib per Parameter

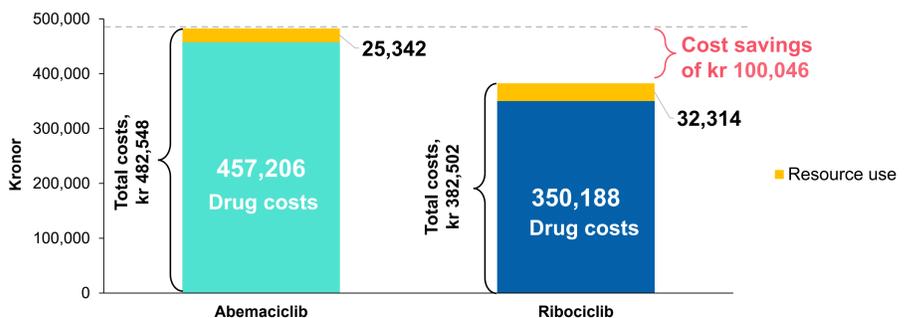


kr, kronor; ToT, time on treatment.

Resource Use and Total Costs

- A scenario analysis was conducted including additional resource use costs during the treatment course: 3 years for ribociclib vs 2 years for abemaciclib
 - Per Swedish guidelines, this included oncologist visits, nurse visits, and electrocardiogram monitoring for ribociclib only
- Resource use was estimated at kr 32,314 for 3-year adjuvant ribociclib and kr 25,342 for 2-year adjuvant abemaciclib (Figure 5)
- Total costs, including drug costs and resource use, were calculated at kr 382,502 for ribociclib and kr 482,548 for abemaciclib

Figure 5. Total Costs of 2-Year Abemaciclib and 3-Year Ribociclib Treatment for HR+/HER2- EBC in Sweden



EBC, early breast cancer; HR+/HER2-, hormone receptor positive/human epidermal growth factor receptor 2 negative; kr, kronor.

Limitations

- Mean RDI for abemaciclib in monarchE has not been published in literature; this analysis utilized the RDI percentage reported for the abemaciclib NICE submission (TA810)
- Dosing and ToT were derived from clinical trials and not a real-world setting

Disclosures

A. Schiza has nothing to disclose. M. Kalra, I. Ferrusi, T. Saliba, P. Foss, V. Agarwal, K. Rodha, S. Gupta, and A. Danyliv report employment with and stock ownership from Novartis.