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Cost-Efficiency Modeling of Conversion to Biosimilar Trastuzumab-qyyp in Early-Stage Breast Cancer in Medicare

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Objective

To use cost-efficiency analysis to explore the potential cost-savings and budget-neutral expanded access of shifting treatment from trastuzumab reference product to biosimilars in Medicare patients with early-stage breast cancer.

Conclusion

Use of trastuzumab-qyyp rather than originator trastuzumab, in combination with docetaxel and carboplatin, can result in substantial cost savings in first-line treatment of patients with early-stage breast cancer in Medicare.

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Background

- Originator trastuzumab (Herceptin®) is a human epidermal growth factor receptor 2 (HER2) inhibitor that is approved for first-line treatment of HER2-positive breast cancer (BC) in combination with docetaxel and carboplatin (TCH).[1]
- In 2019, trastuzumab-qyyp (Trazimera®) received FDA approval and entered the U.S. market.[2] Four additional biosimilars are also available in the U.S. market trastuzumab-anns (Kanjinti®), -dttb (Ontruzant®), -pkrb (Herzuma®), and –dkst (Ogivri®).
- Cost-efficiency analysis is a health economics methodology that analyzes the level of savings that can be realized by shifting treatment between alternative therapies and how many additional patients can be treated with the resulting savings.[3]
- The objective of this study is to use cost-efficiency analysis to explore the potential cost-savings and budget-neutral expanded access that can be realized by shifting treatment from originator trastuzumab to biosimilar trastuzumab in Medicare.

Methods

- We developed a Microsoft Excel®–based simulation model to evaluate the cost-efficiency of conversion from originator trastuzumab treatment to treatment with trastuzumab biosimilars among patients with early BC in Medicare.
- The target population of annual patients diagnosed with early BC in Medicare (n=44,073) was calculated using 2024 Medicare enrollment data and incidence rates from Surveillance, Epidemiology, and End Results Program (SEER) or newly diagnosed breast cancer among those age 65 and older.[4-5]
- We assumed that 14% of diagnosed BC patients receive trastuzumab-based treatment per SEER cancer statistics.[6]
- Comparators to originator trastuzumab included trastuzumab-qyyp, -anns, -dttb, -pkrb and -dkst.
- Trastuzumab, docetaxel, and carboplatin dosage information was obtained from product labels.
- Drug acquisition costs were based on average sales price (ASP) from Q1, 2024.[7]
- Following Medicare reimbursement practices, we modeled an ASP reimbursement mark up of 6% for trastuzumab originator, carboplatin, and paclitaxel, and 8% for trastuzumab biosimilars.[8]
- Outcomes included per-patient per-month (PPPM) cost-savings (vs. originator), total monthly savings in the cohort, and number needed to convert (NNC) to biosimilar to fund treatment of an additional 100 patients.
- NNC and total expenditure savings were evaluated in 50% and 100% biosimilar conversion scenarios.

Results

- In 50% (n=3,085) and 100% (n=6,170) conversion scenarios focused on conversion to trastuzumab-qyyp, mean PPPM savings were $2,127 and $4,253, respectively. (**Table 1**)
- In 50% and 100% conversion scenarios focused on conversion to trastuzumab-qyyp, full cohort monthly savings were $13,122,555 and $26,245,111 respectively.
- These biosimilar conversion-associated savings are 41% and 82% reductions in cost vs. originator-based treatment, respectively.

Outcome	Conversion to Biosimilar		
	None	50%	100%
# Using Originator Trastuzumab Monthly	6,170	3,085	0
# Using Trastuzumab -qyyp Monthly	0	3,085	6,170
Originator Trastuzumab PPPM Cost	$5,181	$5,181	N/A
Trastuzumab-qyyp PPPM Cost	N/A	$928	$928
Total Mean PPPM Cost	$5,181	$3,055	$928
PPPM Savings vs. No Conversion Scenario	Reference	$2,127	$4,253

Table 1. Per-Patient Per-Month (PPPM) cost-savings with conversion to trastuzumab-qyyp

- Trastuzumab-qyyp savings exceed savings from conversion to other biosimilars trastuzumab-anns, -dttb, -pkrb, or -dkst. (**Figure 1**)
- At 100% conversion, monthly savings from biosimilar conversion could fund up to 28,285 additional patient-months of treatment with trastuzumab-qyyp + docetaxel + carboplatin.
- The NNC was 22 to treat an additional 100 patients with trastuzumab-qyyp + docetaxel + carboplatin and ranged from 36 to 416 with alternative trastuzumab biosimilars. (**Figure 1**)

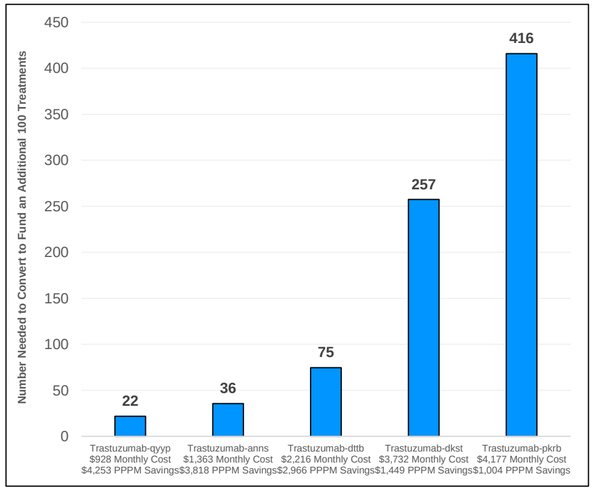

Figure 1: Cost-efficiency results for trastuzumab biosimilars vs. originator trastuzumab

Discussion

- We demonstrate that trastuzumab-qyyp + docetaxel + carboplatin can result in substantial cost-savings vs. originator trastuzumab + docetaxel + carboplatin for first-line treatment of patients with early BC in Medicare.
- These cost savings could be reinvested to treat a substantial number of additional patients with BC or fund other costs of care in Medicare, on a budget-neutral basis.
- The strengths of this study include:
  - Assessment of potential savings with all trastuzumab biosimilars available at the time of the analysis
  - Evaluation of NNC outcome that is aligned with decision-making needs of physicians, system administrators, payers, and other stakeholders
- The limitations of this study include:
  - Real-world cost-savings could be reduced and NNC could increase if current biosimilar uptake is higher than the scenarios modeled in this study
  - Our estimate of the monthly number of patients treated with trastuzumab is based on CMS enrollment and SEER BC incidence data and could vary from observed use in Medicare in a given month.
  - We focus on treatment cost outcomes as the major differentiator between biosimilars, but other outcomes could be considered too.
- Future research should reassess cost-efficiency if ASP changes substantially and/or if new trastuzumab biosimilars enter the market.

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