Impact of delaying disease recurrence on economic burden in patients with HER2+ early-stage breast cancer (eBC)

Sandhya Mehta,[1] Eleanor Faherty,[1] Nicole Princic,[2] Meghan Moynihan,[2] Caroline Henriques[2]

[1]Daiichi Sankyo, Inc.; [2]Merative

Objective

- This study aimed to assess neoadjuvant and post-neoadjuvant/adjuvant treatment patterns, recurrence rates, and impact of recurrence timing on cumulative cost burden among patients with HER2+ early breast cancer (eBC).

Conclusions

- The disease recurrence rate was highest among patients who were not treated with antineoplastic pharmacologic therapy in the neoadjuvant or post-neoadjuvant/adjuvant settings (before or after breast cancer surgery).
- The 3-year cumulative costs burden was higher among patients with recurrence within the first 12-months post-surgery compared to those with no recurrence during follow-up. These costs increased further among patients with chemotherapy in the post-neoadjuvant/adjuvant setting (vs HER2 targeted treatment) and among those without any neoadjuvant therapy.
- The study findings highlight that use of HER2 targeted treatment (associated with longer event free survival) earlier in the treatment pathway may improve patient outcomes and reduce the healthcare burden associated with BC.

Plain language summary

Why did we perform this research?
With the advent of new HER2+ targeted treatment in the eBC neoadjuvant and post-neoadjuvant/adjuvant setting,[1,2] treatment management is expected to change considerably, and therefore robust contemporary real-world analyses are needed to understand current treatment practices and long-term economic burden among these patients.

How did we perform this research?
A retrospective observational study was conducted using administrative claims databases to assess neoadjuvant and post-neoadjuvant/adjuvant treatment patterns and their impact on recurrence and cost of disease progression. A total of 3,745 HER2+ eBC U.S patients were included. Recurrence was reported during the post-surgery period and impact of early and delayed recurrence on cumulative cost burden was measured using generalized linear models.

What were the findings of this research and what are the implications?
The data reveals that HER2+ eBC patients experiencing early recurrence incurred significantly higher cost burden in a long-term than those without recurrence.

Introduction

- There is a gap in understanding the impact of early disease recurrence on cumulative cost burden in HER2+ early breast cancer (eBC).
- Real-world studies exploring the healthcare burden of treatment for patients with HER2+ eBC are limited. The most recent uses administrative claims data from 2008-2013 and includes less than a thousand patients.[3]
- With the introduction of new HER2+ targeted treatments in the eBC neoadjuvant and post-neoadjuvant/adjuvant settings, treatment management is expected to change considerably, justifying the need for more contemporary research to quantify the economic impact of delaying disease progression and among HER2+ eBC patients.

References

1. T-DXd Alone or in Sequence With THP, Versus Standard Treatment (ddAC-THP), in HER2+ eBC, ClinicalTrials.gov. (2023).
2. T-DXd Versus Trastuzumab Emtansine (T-DM1) in High-risk HER2+ With Residual Invasive BC Following Neo Therapy (DESTINY-Breast05), ClinicalTrials.gov. (2023).
3. DaCosta Byfield, S. et al. J Oncol Pract, (2016).

This study is sponsored by Daiichi Sankyo, Inc. In March 2019, AstraZeneca entered into a global development and commercialization collaboration agreement with Daiichi Sankyo for trastuzumab deruxtecan (T-DXd; DS-8201).

Disclosures: SH and EF are employed by Daiichi Sankyo, Inc.. NP, MM, and CH are employed by Merative, which was contracted to perform this study

Poster presented at AMCP Nexus October 2024; for further details contact: Sandhya Mehta, sandhya.mehta@daiichisankyo.com

Methods

- Patients were identified from Merative™ MarketScan® Commercial and Medicare Database in the U.S for this retrospective study. (**Figure 1**)
- Surgery within a year of breast cancer diagnosis delineated neoadjuvant and adjuvant periods, before and after surgery date.
- Disease recurrence post-surgery was defined by restart of chemotherapy treatment (after 90-day gap following discontinuation of post-neoadjuvant/adjuvant therapy) initiation of chemotherapy more than 120 days post-surgery (after the adjuvant window), a new diagnosis of metastasis, or evidence of end-of-life care.
- Generalized linear models (GLM) (gamma distribution and log link) adjusting for patient demographics and treatment type were utilized to assess impact of disease recurrence on cumulative 3-year total all-cause costs during the post-surgery follow-up period.

Figure 1. Patient Attrition

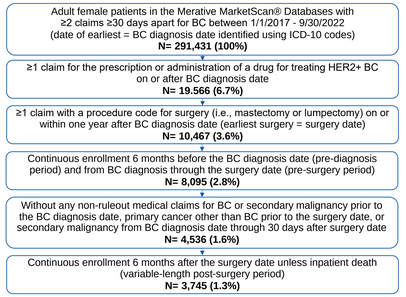
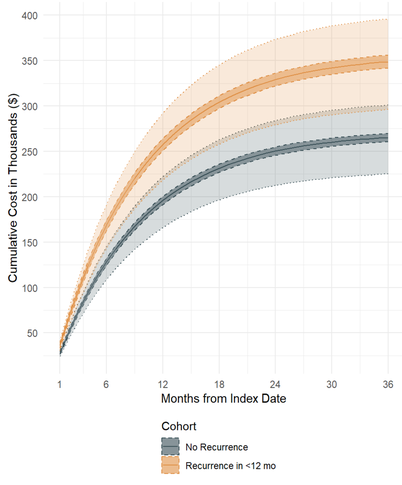


Table 1. Patient Characteristics

	Neoadjuvant and post-neoadjuvant (N=1,504)	Adjuvant only (N=2,151)	Surgery only (N=70)
Age, mean (SD)	51.3 (10.6)	55.2 (10.2)	56.5 (12.7)
Insurance plan type, n (%)			
Compr/EPO/PPO	771 (51.3%)	1,124 (52.3%)	36 (51.4%)
HMO	227 (15.1%)	349 (16.2%)	20 (28.6%)
POS/CDHP/HDHP/Oth	506 (33.6%)	678 (31.5%)	14 (20.0%)
Clinical conditions, n (%)			
Hypertension	334 (22.2%)	615 (28.6%)	22 (31.4%)
Depression	134 (8.9%)	226 (10.5%)	5 (7.1%)
Diabetes (mild/moderate)	121 (8.1%)	221 (10.3%)	4 (5.7%)
Chronic obstructive pulmonary disease	102 (6.8%)	183 (8.5%)	6 (8.6%)
Anaemia	63 (4.2%)	99 (4.6%)	8 (11.4%)
Coronary artery disease	28 (1.9%)	60 (2.8%)	4 (5.7%)
Diabetes (with chronic complications)	25 (1.7%)	54 (2.5%)	1 (1.4%)

CDHP, Consumer-driven health plan; Compr, Comprehensive; EPO, Exclusive provider organization; HDHP, High deductible health plan; HMO, Health maintenance organization; POS, Point of service; PPO, Preferred provider organization; Oth, Other

Figure 4. GLM Cumulative Cost Comparing No Recurrence versus <12m Recurrence



Characteristic	exp(Beta)	95% CI	p-value
Cohort			
No Recurrence	–	–	–
Recurrence <12m	1.31	1.11, 1.57	0.002
Month	0.90	0.90, 0.90	<0.001
Age of patient	0.99	0.99, 0.99	<0.001
Insurance plan type			
Compr/EPO/PPO	–	–	–
HMO	0.90	0.85, 0.96	<0.001
POS/CDHP/HDHP/Oth	0.97	0.93, 1.02	0.200
Neoadjuvant treatment	0.85	0.77, 0.93	<0.001
Post-neoadjuvant/Adjuvant regimen			
HER2	–	–	–
Any chemotherapy	1.28	1.16, 1.41	<0.001
Other	1.31	1.23, 1.41	<0.001

Among neoadjuvant and post-adjuvant treatment and adjuvant treatment only (N=3,655), of which 3,097 with no recurrence and 436 with recurrence within 12 months of surgery. Mean (middle line), IQR (darkly shaded band), and 95% CI of mean (lightly shaded band) are shown in the figure.

- Patients with recurrence within 12 months of surgery incurred 31% higher costs in any given month (p = 0.002) compared with patients without recurrence; this difference compounds overtime. (**Figure 4**)
- GLM showed cumulative cost burden following surgery was higher among patients who experienced recurrence in <12-months vs no recurrence ($348,834 vs $265,279). (**Figure 4**)
- Patients with chemotherapy as a post-neoadjuvant/adjuvant treatment had higher cumulative cost burden (RR 1.28; p-value<0.001) compared with patients receiving HER2 targeted treatment. (**Figure 4**)
- Patients who received neoadjuvant treatment had lower cost burden (RR 0.85, <0.001) compared with patients that did not receive any neoadjuvant therapy. (**Figure 4**)

Results and Interpretation

Figure 2. Treatment Cohorts

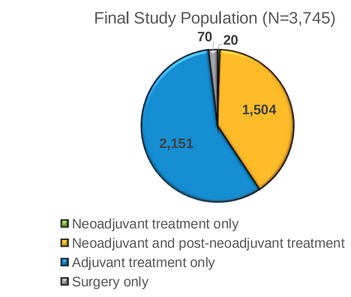


Table 2. Treatment Regimens

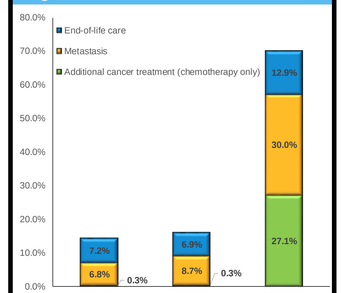
Regimens, n (%)	Neoadjuvant (N=1,524)	Post-neoadjuvant/ Adjuvant (N=3,655)
Chemo only	**128 (8.4%)**	**129 (3.5%)**
monotherapy	12 (0.8%)	14 (0.4%)
combination therapy	116 (7.6%)	115 (3.1%)
Chemo + Targeted	**1,302 (85.4%)**	**1,928 (52.7%)**
chemo + T	116 (7.6%)	1,581 (43.3%)
chemo + T + P	1,182 (77.6%)	341 (9.3%)
Chemo + Endocrine	**5 (0.3%)**	**2 (0.1%)**
Chemo + Endocrine + Targeted	**16 (1.0%)**	**28 (0.8%)**
Targeted only	**21 (1.4%)**	**1,159 (31.7%)**
T	9 (0.6%)	536 (14.7%)
T + P	8 (0.5%)	441 (12.1%)
ado-trastuzumab emtansine	1 (0.1%)	116 (3.2%)
Endocrine + Targeted	**5 (0.3%)**	**326 (8.9%)**
Endocrine only	**47 (3.1%)**	**83 (2.3%)**

Chemo, Chemotherapy; P, pertuzumab; T, trastuzumab

- Among those with neoadjuvant treatment, chemotherapy + trastuzumab (T) + pertuzumab (P) (77.6%) were the most common regimens. (**Table 2**)
- Among those with post-neoadjuvant/adjuvant treatment, the use of chemotherapy + T (43.3%) was common followed by T alone (14.7%) and T + P (12.1%). (**Table 2**)

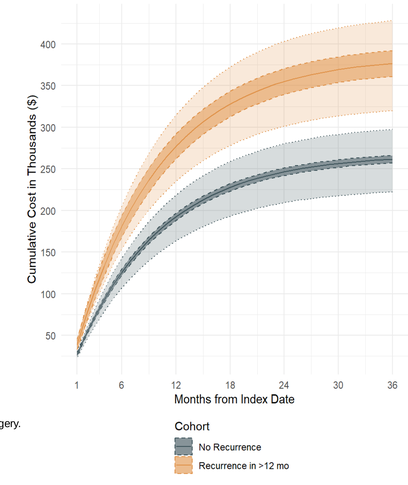
- A total of 3,745 patients with HER2+ eBC were included in the study. (**Figure 1**)
- Of these 57.4% (n=2,151) had adjuvant treatment only, 40.2% (n=1,504) had neoadjuvant and post-neoadjuvant treatment, 1.9% (n=70 had) surgery only, and 0.5% (n=20) had neoadjuvant treatment only. (**Figure 2**)
- Mean age was slightly younger for patients receiving both neoadjuvant and post-neoadjuvant treatment (51.3 years) compared to adjuvant treatment only (55.2 years) and surgery (56.5 years) only. (**Table 1**)
- Chemotherapy + targeted regimens were the most common in both the neoadjuvant (85.4%) and post-neoadjuvant/adjuvant (52.7%) settings. (**Table 2**)

Figure 3. Disease Recurrence



- During the post-surgery period (median follow-up: 2 years), recurrence rate was highest for patients with surgery only (70.0%) and similar among patients with adjuvant treatment only (16.0%) and patients with neoadjuvant and post-neoadjuvant treatment (14.3%). (**Figure 3**)

Figure 5. GLM Cumulative Cost Comparing No Recurrence versus >12m Recurrence



Characteristic	exp(Beta)	95% CI	p-value
Cohort			
No Recurrence	–	–	–
Recurrence >12m	1.44	1.30, 1.60	<0.001
Month	0.90	0.90, 0.90	<0.001
Age of patient	0.99	0.99, 0.99	<0.001
Insurance plan type			
Compr/EPO/PPO	–	–	–
HMO	0.90	0.85, 0.96	<0.001
POS/CDHP/HDHP/Oth	0.97	0.93, 1.02	0.200
Neoadjuvant treatment	0.84	0.77, 0.92	<0.001
Post-neoadjuvant/Adjuvant regimen			
HER2	–	–	–
Any chemotherapy	1.27	1.16, 1.39	<0.001
Other	1.26	1.17, 1.35	<0.001

Among neoadjuvant and post-adjuvant treatment and adjuvant treatment only (N=3,655), of which 3,097 with no recurrence and 122 with recurrence >12 months after surgery. Mean (middle line), IQR (darkly shaded band), and 95% CI of mean (lightly shaded band) are shown in the figure.

- Patients with recurrence >12 months after surgery incurred 44% higher costs in any given month (p < 0.001) compared with patients without recurrence; this difference compounds overtime. (**Figure 5**)
- GLM showed cumulative cost burden following surgery was higher among patients who experienced recurrence in >12-months vs no recurrence ($376,755 vs $261,688). (**Figure 5**)