Do Subcutaneous Treatments Provide Most Cost Savings Than Intravenous Treatments in Breast Cancer: A Literature Review

EE827

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Astha Jain[1], JE Poirrier[2], Ravi Chakali[3], Sugandh Sharma[1]
Parexel International, [1] Chandigarh, India; [2] Wavre, Belgium; [3] Hyderabad, India

Background

Breast cancer (BC) is the most prevalent cancer globally, with 2.3 million women diagnosed in 2022 (WHO). Intravenous (IV) infusions of chemotherapies and biologics are widely utilized, and subcutaneous (SC) treatments have come to the market in recent years. While SC treatments are expected to save time and resources compared to IV, a systematic analysis of potential cost savings has not been conducted. The purpose of this literature review was to identify cost-minimization analyses comparing SC and IV BC treatments globally.

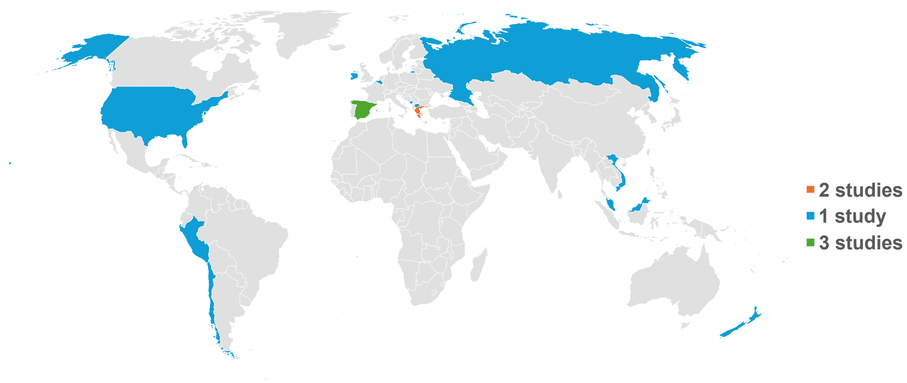
Methods

- A comprehensive search strategy was designed to retrieve relevant data from published literature. MEDLINE® and Embase® databases were searched using the www.embase.com interface to identify breast cancer cost-minimization studies published from database inception until June 2024
- Inclusion criteria included adult female patients diagnosed with any stage of BC who received SC vs. IV treatments
- Study design: limited to cost-minimization analyses; Geography: Global; Language: English

Results

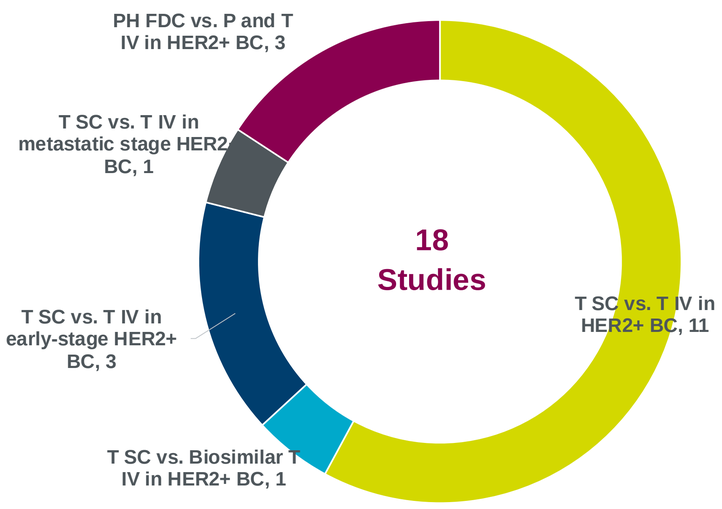
- The database search identified 67 records. Following title/abstract screening, 44 records were excluded, as the study type was not cost-minimization analysis. After full-text review, another five records were excluded as there were not cost-minimization studies. 18 studies were included in this review.
- Of the 18 relevant studies identified, 8 were published as journal articles, while the remaining 10 were presented as conference abstracts. The evidence from the studies is provided in Table 1.

Figure 1: Geographical Distribution of Studies



Spain=3, Greece=2, Hong Kong=1, Russia=1, North Macedonia=1, New Zealand=1, Ireland=1, Montenegro=1, Belgium=1, Singapore=1, Malaysia=1, Chile=1, Vietnam=1, Peru=1, Western Europe and the United States=1

Figure 2: Overview of Studied Treatment Comparisons



One study (Nguyen 2020) has reported data for both early and metastatic HER2+ BC and has been counted in both the sections in the above graph.

Table 1: Summary of Cost Minimization Analyses in Overall Breast Cancer Patients

Study name	Publication type	Country	Treatment cycles	Cost year	Total cost-savings per patient for treatment course or as specified	Cost components investigated
T SC vs. T IV in HER2+ BC						
Mylonas 2017	A ®	Greece	18 cycles	2014	€1,248	Total Non-Drug Cost, Administration & Physician, Consultation cost, Central Venous Access Device cost, Overhead cost, Total Drug Cost, Drug Acquisition Cost
Mylonas 2014	CA ®	Greece	18 cycles	2014	€1,121	Drug Acquisition Cost, Consumables Dispensed, Hospital Overheads, Physician and Other Staff Time, Administration Cost, Central Venous Access Device Cost
O'Brien 2019	A	Ireland	17 cycles	2018	€1,786.58	Direct Costs (Healthcare Professional Costs, Consumable Costs, Drug Costs), Indirect Costs
Tjalma 2018	A ®	Belgium	18 cycles	NR	€3,832.74	Healthcare Professional Time and Salary, Consumables (Syringes, Cotton, Alcohol, etc.), Drug Wastage
Kulikov 2015	CA	Russia	NR	NR	€3,153	Main Drug Therapy, Concomitant Therapy (Medical Services and Drugs), Drug Introduction, Services Provided by Medical Personnel, Administration Conditions (Hospitalization or Outpatient)
Nestorovska 2015	CA ®	North Macedonia	18 cycles	2015	€5,892	Drug Treatment, Patient's Room and Chair Time Treatment, Active Healthcare Professional Time, Consumables, Patient Transport
Camean-Castillo 2016	CA	Spain	18 cycles	NR	Savings for the 312 administrations for patients >63 kg: €112,754	Drug Costs
North 2015	A ®	New Zealand	NR	2012	76.94 per cycle Annual savings: NZ$519,499	Average Health Care Professional Nurse Time, Chair Cost, Pharmacist Time, Consumables Cost
Lee 2018	CA	Hong Kong	18 cycles	NR	Annual savings: HK$52,316,614	Drug Acquisition Cost, Healthcare Professional Cost
Todorovic 2017	CA ®	Montenegro	18 cycles	NR	Savings per mean patient weight: 9.9%	Direct Costs: Drug Treatment; Indirect Costs: Chair Time Treatments, Daily Hospital Fee, Active Healthcare Professional Time, Consumable Disposals, Patient Transport, Sick Leaves
Ghosh 2018	CA ®	Singapore	26 cycles (early: 18 and metastatic 8)	NR	S$9,468	Drug Cost, Non-Drug Costs (Pre-medications, Drug Preparation, Venous Access, Trastuzumab Administration, Facilities)
T SC vs. T IV in early-stage HER2+ BC						
Lopez-Vivanco 2017	A ®	Spain	18 cycles	2016	€1,132.43	Direct (Costs of Tasks Observed, Cost of Consumables, Drug Cost's) and Indirect Cost's
Rojas 2020	A ®	Chile	18 cycles	2017	$6,241 per year	Direct (Preparation, Administration, ADR (average), Non-medical costs)
Nguyen 2020	CA	Vietnam	NR	NR	₫45.11-232.16 million	Drug Cost, Labor Cost, Other Costs Related to Route of use, Non-medical Direct And Indirect Costs
T SC vs. T IV in metastatic stage HER2+ BC						
Nguyen 2020	CA	Vietnam	NR	NR	₫25.52-91.65 million	Drug Cost, Labor Cost, Other Costs Related to Route of use, Non-medical Direct And Indirect Costs
T SC vs. Biosimilar T IV in HER2+ BC						
Heng 2024	A	Malaysia	17 cycles	NR	Savings with biosimilar T IV: $8,068	Drug, Consumables, Personnel costs
Fixed-dose combination of pertuzumab and trastuzumab in HER2+ BC						
Manevy 2021 (ES)	CA ®	Western Europe	18 cycles	NR	PH FDCSC vs. P and T IV: Range: €2,474-€8,975	Non-drug cost
Manevy 2021 (ES)	CA ®	USA	18 cycles	NR	PH FDCSC vs. P and T IV: $10,138	Non-drug cost
Figallo 2023 (MS)	A ®	Peru	18 cycles	NR	Annual cost savings with PH FDCSC vs. P and T IV: $5,395	Direct cost (Healthcare professionals, Non-drug consumables, Drug costs), Indirect cost
Calleja 2023 (ES and MS both separately)	CA ®	Spain	NR	2023	PH FDCSC vs. P and T IV: Cost savings up to 84.1% in ES and up to 50.8% in MS	Direct and Indirect Costs

A: Article; BC: Breast Cancer; CA: Conference abstract; ES: Early-Stage; FDCSC: Fixed-Dose Combination for Subcutaneous Use; HER2+: Human Epidermal Growth Factor Receptor 2 Positive; HKD: Hong Kong Dollar; IV: Intravenous; MS: Metastatic Stage; NA: Not Available; NR: Not Reported; NZD: New Zealand Dollar; P: Pertuzumab; PH: Pertuzumab and Trastuzumab; SC: Subcutaneous; T: Trastuzumab; USD: United States Dollar; VND: Vietnamese Dong; ® - Citations that are either funded by Roche or has one or more authors from Roche

Conclusions

- This review suggests that T SC (including PH FDCSC) is saving costs compared to T IV in HER2+ BC patients. This saving is present regardless of cost components investigated and geographies.
- One study from Malaysia presented savings of USD 8,068 with biosimilar T IV compared to T SC due to a reduction in the cost of the biosimilar drug. However, additional research for other geographies using biosimilar drugs needs to be conducted to establish the cost benefit of biosimilar IV.
- T SC was one of the early IV drugs that was reformulated, so the evidence identified may be indicative of cost savings for other cancer therapies that have since been reformulated from IV to SC.
- This review revealed that 12 of the included studies were either funded by Roche or have one or more authors from Roche (the manufacturer of trastuzumab) that may potentially introduce some bias in the economic benefit of T SC over T IV.

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