Cost comparison Between the Use of Pertuzumab-Trastuzumab SC and IV Formulations to Treat HER2+ Breast Cancer Patients in Algeria

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Objective

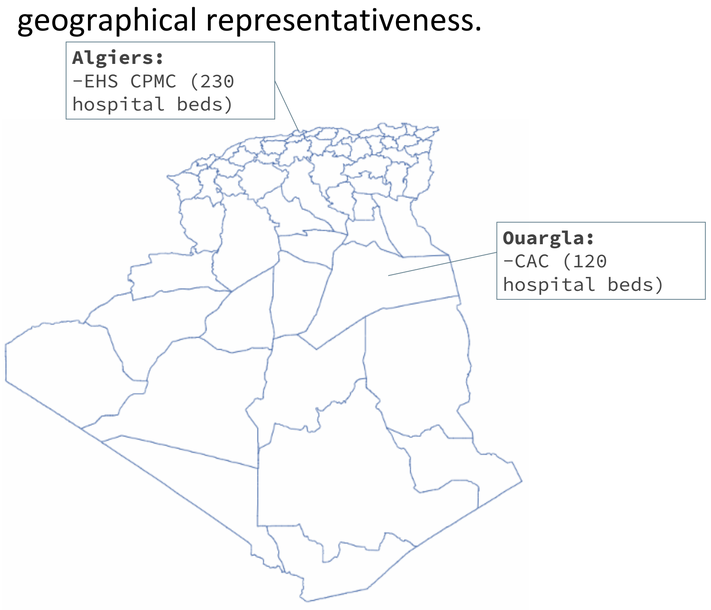
The combined trastuzumab/pertuzumab SC formulation is approved for use in conjunction with docetaxel for adult patients diagnosed with HER2-positive early and metastatic breast cancer stages. This combination serves as an alternative to administering the two targeted therapies separately, both of which are delivered intravenously.

The FeDeriCa study, demonstrated that the fixed-dose combination of subcutaneous trastuzumab/pertuzumab is non-inferior to the intravenous administration of these agents. Safety profiles were also similar, reinforcing the potential of subcutaneous delivery as a viable alternative in clinical practice[1], thereby enhancing patient convenience and treatment adherence.

The primary objective of this study is to analyze the differences in direct administration costs between subcutaneous (SC) and intravenous (IV) administration routes for trastuzumab/pertuzumab in HER2+ breast cancer patients, while also examining the direct non medical costs related to patients travel expenses. The secondary objective was to observe whether there were disparities in access between the two regions included.

Methods

The analysis was conducted in two (02) Algerian healthcare settings (CPMC Algiers and CAC Ouargla). The selection of healthcare centers for the study was guided by two primary criteria: The comprehensiveness of their service offerings and their geographical representativeness.



Key variables included in the analysis were the direct medical costs associated with healthcare professional (HCP) time spent in the preparation, administration and observation of the trastuzumab/pertuzumab regimen and the consumables costs while direct non medical costs included patient travel expenses to healthcare centers.

As diagnosis-related groups (DRGs) are not available in Algeria, we used data from a micro-costing analysis we conducted in the two healthcare sites. For intravenous (IV) administration, the time required for drug preparation, administration, and observation was directly measured using a stopwatch, with healthcare professional (HCP) time reported according to specific roles (e.g., pharmacists, nurses, nursing assistants).

Medical staff costs took into account hourly wage and time of the procedure.

To calculate travel costs, we collected data on patients' place of residence from admission records. We estimated average distances and used the travel prices from transportation booking platform.

Since the subcutaneous (SC) formulation is not yet available in Algeria, equivalent data for the Pertuzumab-Trastuzumab SC formulation were extracted from existing literature[2] to allow for a comparison.

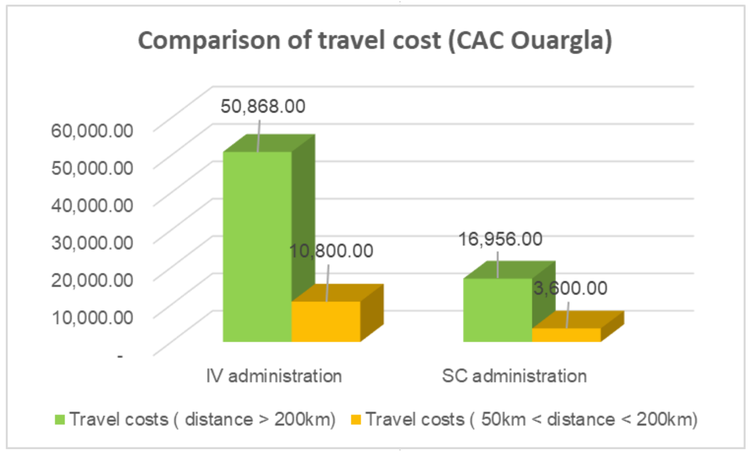
Treatments costs were not included since we made the assumption that the prices for SC formulation and IV formulations will be equivalents taking into consideration the introduction of Trastuzumab biosimilars. Cost calculations were based on a full course of treatment consisting of 18 cycles.

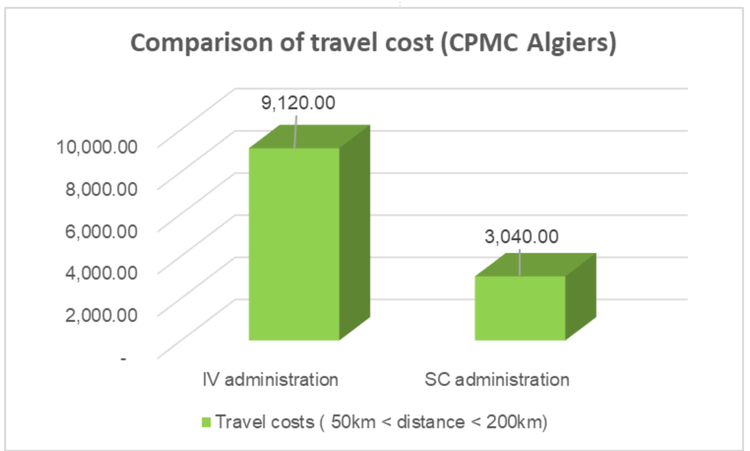
Results

Overall time spent per cycle on preparation, administration, and observation is 100 minutes for IV compared to 20 minutes for SC. For an 18-cycle treatment, the estimated consumable cost per patient is 12,779 DZD for IV compared to 180 DZD for SC, and estimated staff costs per patient are 34,508 DZD for IV versus 5,008 DZD for SC. SC formulation required less monitoring and administration time, decreasing the overall cost. SC formulation would potentially allow savings of approximately 42,099 DZD per patient for consumable and medical staff costs.

For CAC ouargla, the SC formulation allows for 7,200 DZD travel cost reduction for patients traveling more than 50km and less than 200km, and 33,912 DZD for patients traveling more than 200km. For CPMC Algiers, travel cost saving is 6,080 DZD for patients traveling more than 50km and less than 200km.

	IV administration	SC administration
Direct costs		
Total cost	47,287 DZD	5,188 DZD
Consumables cost	12,779 DZD	180 DZD
Medical staff cost	34,508 DZD	5,008 DZD





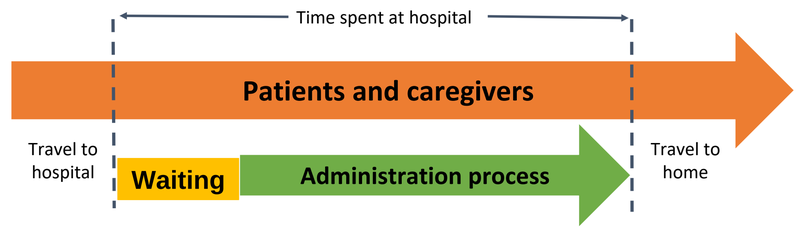
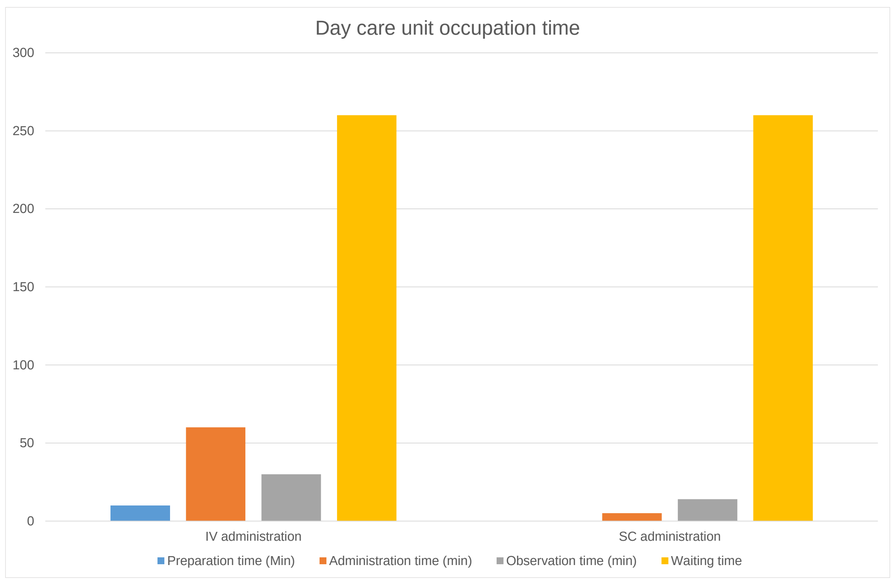


Fig 1: Diagram of time spent by patients and caregivers analysis

Day care unit occupation was estimated at 6 hours for IV administration and 4 hours 40 minutes for SC administration.



Discussion

Patients receiving the SC presentation don't need to travel away from their place of residence to receive their treatment, this reduce considerably theirs expenses and the time they spend to receive the treatment. No difference in the waiting time was observed between the two administrations but the day unit occupation difference between the two formulations allow the hospital to manage more patients within the same facility.

Our study did not include any indirect costs but our results are consistent with published studies showing a better pharmacoeconomic profile of the SC presentations of trastuzumab/pertuzumab with decrease strain on time and resources of medical centers and healthcare professionals, a lower wastage of doses and a higher safety due to avoiding potential mistakes of dosage or preparation and infusion reactions.

Travel costs observed between our two study centers show geographical disparities in healthcare access and underscores SC administration as not only a cost-efficient strategy but also one that enhances patient experience and accessibility and participate in reducing geographical disparities.

1.Tan AR, Im SA, Mattar A, Colomer R, Stroyakovskii D, Nowecki Z, et al. Fixed-dose combination of pertuzumab and trastuzumab for subcutaneous injection plus chemotherapy in HER2-positive early breast cancer (FeDeriCa): a randomised, open-label, multicentre, non-inferiority, phase 3 study. The Lancet Oncology [Internet]. 2021 Jan 1;22(1):85–97.

2.Time and motion randomised study of a subcutaneous (SC) pertuzumab and trastuzumab fixed-dose combination (PH FDC) for the treatment of HER2-positive early breast cancer (HER2 EBC): PHaTiMa