SHORT COMMUNICATION
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Pharmacoeconomic analysis of the genomic test Mammaprint® use for breast cancer patients treated at a private health institution in Brazil

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INTRODUCTION

Breast cancer is the malignant neoplasia with the highest incidence in Brazilian women, below non-melanoma skin cancer[1,2]. About 75% of all breast cancers have a luminal biological profile (positive hormone receptors), based on the immunochemistry profile[3]. In addition to surgical management and hormonal treatment, some of these patients are selected to undergo chemotherapy, according to their clinical and pathological status. With the availability of some genomic tests, such as MammaPrint™, we can refine the indication of adjuvant chemotherapy, reducing financial costs associated with the use of medications and their complications, but mainly the cost of social treatment related to the significant toxicity of these therapies.

OBJECTIVES

To analyze the financial results of MammaPrint™ introduction at a private health institution in Brazil.

MATERIALS AND METHODS

We selected patients with luminal breast carcinoma who had clinical/pathological stage I and II high risk cancer, with up to three positive lymph nodes, according to the MINDACT study criteria[4]. We analyzed the cost of adjuvant chemotherapy with the most frequently used regimens for luminal tumors (docetaxel + cyclophosphamide – TC x 4 and doxorubicin + cyclophosphamide – AC-T weekly), according to the pharmaceutical guidelines by Brasíndice 2019[5], using a body surface area of 1.7 m^2 equivalent to the median found in patients treated at the *Instituto Sul Paranaense de Oncologia* (ISPON). Commercial cost of MammaPrint™ in Brazil in February 2019 was BRL 14,000.00 (approximately USD $ 3,500.00 — Gencell Pharma). A pharmacoeconomic analysis was performed according to a reduction in the indication of chemotherapy using MammaPrint™, based on the results presented in the MINDACT study. Costs include medications and infusion supplies, and do not include medical fees and treatment of complications.

RESULTS

The costs for the eight cycles of the weekly AC-T scheme represent BRL 75,070.80 (USD $ 18,767.70), as in Table 1. Applying a 46% reduction of the indicated chemotherapy, according to the MINDACT study, and adding the cost of MammaPrint™ to all patients, we reached BRL 54,538.23 (USD $13,634.55) on average per patient, representing savings of BRL 20,532.56 (USD $ 5,133.14) for each individual. When we evaluated the TC scheme for four cycles, we obtained a value of BRL 38,763.28 (USD $ 9,690.82) for each patient. Applying the same 46% reduction in the chemotherapy indication and adding the cost of MammaPrint™, we obtained an average of BRL 35,707.43 (USD $ 8,926.86), representing savings of BRL 3,055.85 (USD $ 763,96) per patient (Figures 1 and 2).

CONCLUSION

When analyzing the application of the genomic test MammaPrint™ in breast cancer patients, according to the MINDACT study criteria, we observed a reduction in the mean cost per patient with the two most widely used adjuvant chemotherapy schemes in tumors with a luminal profile. The costs may vary according to the commercial negotiations and the structure of each service; therefore, individualized evaluation is required.

AUTHORS' CONTRIBUTIONS

M.K.: analysis of date and costs; tables, figures and text review.

F.P.M.: research and date structuring, comparative analysis and preparation of final manuscript.

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Table 1. Antineoplastic drugs and costs of supplies for each infusion in USD.

	$ Unitary	AC	Paclitaxel	TC
Antineoplastic drugs				
Doxorubicin 10 mg	26.58	26.58		
Doxorubicin 50 mg	111.67	223.34		
Cyclophosphamide 200 mg	3.86	3.86		3.86
Cyclophosphamide 1,000 mg	14.33	14.33		14.33
Paclitaxel 30 mg	204.62		204.62	
Paclitaxel 100 mg	683.43		683.43	
Docetaxel 20 mg	332.29			996.87
Docetaxel 80 mg	1,194.79			1,194.79
Adjuvant medicines and supplies				
Distilled water 100 mg	1.60	1.60		1.60
Cimetidine 300 mg	0.53		0.53	
Dexamethasone 10 mg (ampoules)	3.60	3.60	7.20	3.60
Dexamethasone 4 mg (tablets)	0.25	2.50		5.00
Diphenhydramine 50 mg	5.12		5.12	
Ondansetron 8 mg	40.56		40.56	
Aprepitant 150 mg	90.12	90.12		
Palonosetron 0.25 mg	93.45	93.45		93.45
Glucose solution 5% 500 mL	1.64		1.64	
Sodium chloride 0.5% 100 mL	1.93	3.86	1.93	1.93
Sodium chloride 0.5% 500 mL	1.67	1.67	1.67	1.67
Sodium chloride 0.5% 1,000 mL	2.72	2.72	2.72	2.72
Medical materials				
Disposable needle	0.54	5.40	2.70	3.24
Intravenous catheter	26.12	26.12	26.12	26.12
Infusion connection	3.82	3.82	3.82	3.82
Macro dropet equipment	1.73	9.62	5.19	5.19
Infusion pump equipment	187.11		187.11	
Infusion filter	45.24		45.24	
Sterile surgical glove	0.77	1.54	1.54	1.54
Luer off protector for syringe	2.38	16.66		
Disposable syringe 3 mL	0.38		0.38	
Disposable syringe 5 mL	0.46	0.92	0.46	
Disposable syringe 10 mL	0.62		0.62	1.86
Disposable syringe 20 mL	1.83	10.98	1.83	5.49
Disposable syringe 60 mL	7.16	7.16	7.16	7.16
Services/fees				
Short infusion (room rate)	75.00	75.00		75.00
Long infusion (room rate)	125.00		125.00	
Total expenses for infusion (USD)		625.05	1,356.59	2,449.24

AC: doxorubicin + cyclophosphamide; Paclitaxel w: paclitaxel weekly; TC: docetaxel + cyclophosphamide.

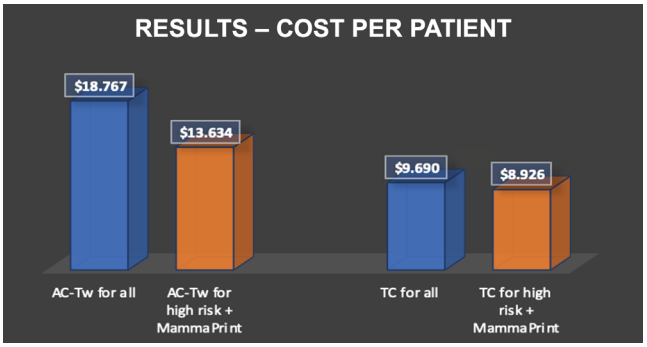


Figure 1. Results: cost per patient.

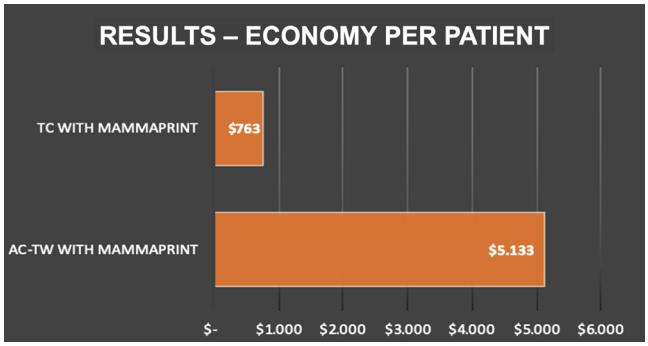


Figure 2. Economy per patient.

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