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COST-UTILITY ANALYSIS OF TALAZOPARIB VERSUS CHEMOTHERAPY FOR PATIENTS WITH BREAST CANCER HER2- WITH MUTATION IN THE BRCA1/2 GENE FROM THE BRAZILIAN PRIVATE HEALTHCARE SYSTEM PERSPECTIVE

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INRODUCTION

Breast cancer is the most common neoplasm in women in Brazil, being the main cause of death from cancer in this population (1). Specifically, the germline BRCA mutation affects younger women, reducing productivity at work and early deaths, since most of the cases are already diagnosed with advanced disease. In patients with BRCA-positive metastatic and HR+/HER2-negative and triple-negative breast cancer, the estimated median overall survival (OS), after diagnosis of metastatic disease, is 38 months, decreasing to 23.4 months (2). Considering this context, it is essential to offer technologies that can reduce the progression of the disease, improve the quality of life of patients and reduce cases of death.

OBJECTIVE

The aim of this analysis is to compare incremental cost-effectiveness ratio (ICER) between talazoparib and standard chemotherapy the treatment of metastatic breast cancer HER2- with mutation in the BRCA1/2 gene, from the perspective of the Brazilian private healthcare system.

METHODS

A cost-utility analysis was developed, with and partitioned survival model, in three-week cycles, where patients can move between three states: progression-free survival, progression and death. The transition between these three states is made from the OS and progression-free survival (PFS) curves. Due to the limitations of the PFS curves, the Kaplan Meyer curves from the EMBRACA study were directly used. As for the OS curves, it was necessary to carry out a parametric adjustment in order to estimate a time horizon above the 60 months included in the study.

The transition diagram of the cohort simulation model is shown in the Figure 1 bellow.

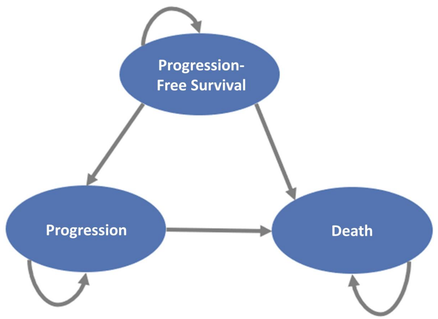

Figure 1. Representation of the transition diagram used in the cost-effectiveness model.

The analysis was conducted from the perspective of the Brazilian public healthcare system, and the outcomes evaluated monthly on the model were life years gained and quality-adjusted life years gained (QALY).

In addition, it was conducted sensitivity analysis (deterministic and probabilistic) in order to evaluate the impact of the variation of some parameters on the results. a variation of +/-20% was considered for all variables included in the deterministic analysis. The probabilistic analysis calculated 1,000 iterations of Monte de Carlo, with a probability distribution of gamma for costs and beta for the other parameters.

RESULTS

Talazoparib treatment showed an increase of approximately 0,33 QALY and 0,42 years when compared to chemotherapy, with an increment in costs. The ICER was estimated at BRL BRL 619,877 per QALY gained and BRL 492,496 for each life year gained (Table 1).

Table 1. Results of the cost-utility analysis of talazoparib versus chemotherapy for the treatment of breast cancer with the germline BRCA mutation.

	Talazoparib	Standard chemotherapy	Incremental
Total Cost (BRL)	438,678.27	226,431.27	212,247.00
Life years gained	2.28	1.86	0.42
ICER (BRL/LY)			**492,496.49**
Quality-adjusted life years (QALY)	1.45	1.12	0.33
ICER (BRL/QALY)			**619,877.03**

LY: life years; QALY: quality-adjusted life years gained

According to the deterministic sensitivity analysis, utility data and treatment cost with talazoparib were the variables with the greatest impact on the ICER/QALY result (Figure 2).

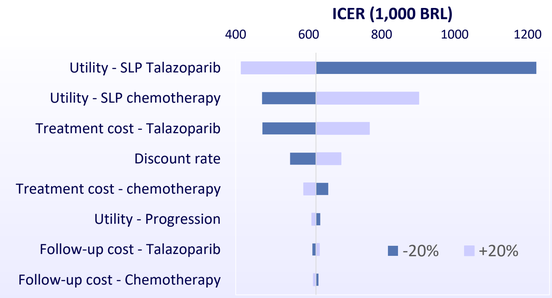

Figure 2. Deterministic sensitivity analysis tornado diagram for the QALY outcome.

The probabilistic sensitivity analysis results are presented in the incremental cost-effectiveness plan (Figure 3), where 100% of the iterations remained in quadrant I (higher cost and greater effectiveness).

The average ICER/QALY of the simulations was BRL 610,391.78.

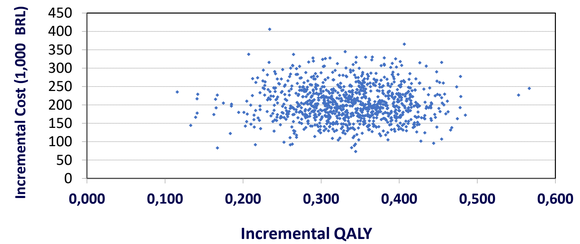

Figure 3. Cost-effectiveness plan for the QALY outcome.

CONCLUSIONS

As presented in this analysis talazoparib showed important gains for PFS, a much higher response rate to treatment with chemotherapy, and improvement in the quality of life with favorable safety profile. These results led important societies (National Comprehensive Cancer Network, European Society for Medical Oncology and *Sociedade Brasileira de Oncologia Clínica*) to include PARP-inhibiting medicine for patients with locally advanced or metastatic breast cancer HER2 negative with germline mutation in the BRCA gene.

References

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