

Cost-effectiveness analyses of docetaxel versus paclitaxel once weekly in patients with metastatic breast cancer progressed after anthracycline chemotherapy in Spain

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Introduction

- Breast cancer is a major public health concern worldwide. It is the most frequent malign tumor and the principal cause of cancer death in the female population in Spain (Zuñigardo 2008)
- Metastatic breast cancer is associated with considerable costs that have an impact on individuals as well as healthcare systems (Remák 2004)
- Docetaxel and paclitaxel are indicated for the treatment of patients with metastatic breast cancer (Saloustros 2008)
- The approved paclitaxel dose is 175mg/m² every 3 weeks but, in current clinical practice, an alternative regimen of 80mg/m² administered once weekly is the most frequently used

Objective

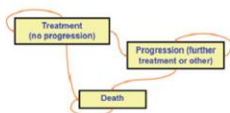
- To evaluate, from the Spanish National Health System perspective, the cost-effectiveness of docetaxel versus a once-weekly paclitaxel regimen in patients with metastatic breast cancer previously treated with anthracycline

Methods

- Markov model (21 day cycle duration) developed to estimate the total treatment-related costs and clinical benefits over 5 years of: Docetaxel 100mg/m² every 21 days (intravenous infusion) and Paclitaxel 80mg/m² once weekly (intravenous infusion)
- Individual patient data and clinical information (time to progression, time to death, incidence of grade 3 or 4 adverse events, use of G-CSF and treatment options after progression) were obtained from: TAX-311 (Jones 2005), Clinical Study Report (CSR) de Taxotere[®], Anglo Celtic Will Weekly Win (WWW) trial (Verrill 2007) and Phase II study (Perez 2001)
- Results are shown as:
 - Incremental cost-effectiveness analysis ratio (ICER): incremental cost of docetaxel versus paclitaxel once weekly per life year gained (LYG)
 - Incremental cost-utility analysis (ICUR): incremental cost of docetaxel versus paclitaxel once weekly per quality-adjusted life year (QALY) gained

- Perspective of the Spanish National Health System
- Direct healthcare costs include:
 - Treatment: docetaxel or paclitaxel (preparation, administration and premedication drugs)
 - Management of grade 3 or 4 adverse events (pain, asthenia, peripheral edema, neurosensory, nausea, stomatitis, diarrhea, infection related to study drug, febrile neutropenia, vomiting, neuromotor, skin, or nail disorders)
 - G-CSF treatment related to febrile neutropenia
 - Erythropoietin treatment or blood transfusion in case of anemia (grade >2)
 - Disease progression: diagnosis progression, and treatment after progression (gemcitabine, vinorelbine or capecitabine)
 - Best supportive care
 - End-of-life phase
- Unit cost (€ of year 2009) were obtained from: Spanish Catalogue of Medicines (Consejo General de Colegios de Farmacéuticos), Spanish health cost database e-Salud (Oblikue Consulting 2009)
- Utility increment and decrement were taken from the literature (Brown 2001, Lloyd 2006)
- Costs and health benefits were discounted at an annual rate of 3.0% (López-Bastida 2008)
- Cost-effectiveness threshold in Spain: 30,000 € per LYG or QALY (Sacristán 2002)
- Sensitivity analyses: One-way deterministic sensitivity analyses, probabilistic analysis through a second-order Monte Carlo simulation with 5,000 runs.

Fig. 1. Model structure



Results

- Docetaxel cost per patient is slightly higher than paclitaxel:
 - Docetaxel: 20,052 €
 - Paclitaxel: 19,982 €
- Docetaxel yields more health benefits than paclitaxel:
 - Docetaxel: 1.83 LYG or 1.08 QALY
 - Paclitaxel: 1.46 LYG or 0.84 QALY
- Incremental cost-effectiveness ratio: 190 € per LYG (of docetaxel versus paclitaxel)
- Incremental cost-utility ratio: 295 € per QALY (of docetaxel versus paclitaxel)

- One-way deterministic sensitivity analyses:
 - The ICUR was most sensitive to: Hazard ratio, discount on the ex-lab price of paclitaxel (Taxol[®]), G-CSF prophylactic treatment, docetaxel dose
 - Variations of other inputs having no relevant influence on the results (adverse event cost: discount rate, time horizon)
- Probabilistic analysis: based on a € 30,000/LYG or QALY threshold, docetaxel, compared with paclitaxel, has a 99% probability of being cost-effective

Table 1. Treatment and administration cost (per cycle) (€ 2009)

	Docetaxel	Paclitaxel
Treatment cost (€ 2009)	1,104.76	1,212.52
Administration and premedication (€ 2009)	320.54	765.41
Preparation and administration	312.55	760.21
Premedication	7.99	5.20
Total cost (per cycle) (€ 2009)	1,424.30 €	1,977.93 €

Table 2. Base case cost-effectiveness results

	Docetaxel	Paclitaxel
Total costs (€ 2009)	20,052.38	19,981.51
Life Year Gained (LYG)	1.83	1.46
Quality-Adjusted Life Year (QALY) gained	1.08	0.84
Incremental cost-effectiveness ratio (€/LYG docetaxel vs. paclitaxel)		190.22
Incremental cost-utility ratio (€/QALY docetaxel vs. paclitaxel)		295.27

Fig. 2. Distribution of total cost per patient

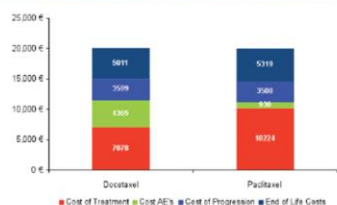


Fig. 3. Sensitivity analyses results. Tornado diagram

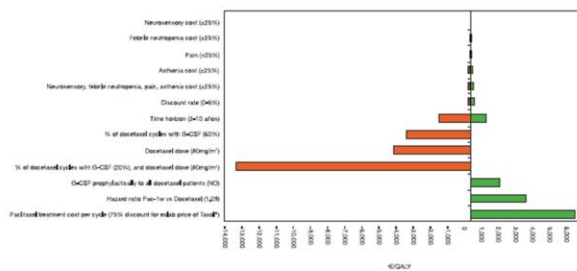
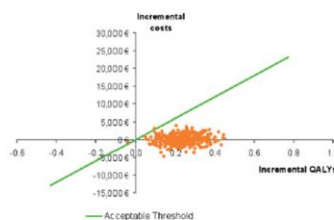


Fig. 4. Probabilistic cost-effectiveness plane of docetaxel versus paclitaxel



Conclusions

- Compared to paclitaxel (80mg/m²) once weekly regimen, docetaxel (100mg/m²) every 21 days is a cost-effective option for treatment in metastatic breast cancer patients
 - Docetaxel yields more health benefits (LYG or QALY) than paclitaxel, with slightly higher cost
 - The results are sufficiently robust with respect to changes in input variables
 - Docetaxel is an efficient strategy despite the hazard ratio scenario of paclitaxel versus docetaxel of 1.09, or with a Taxol[®] discount of 75% of ex-lab price

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