Pharmacoeconomic Analysis of Abrocitinib in Patients with Severe Atopic Dermatitis versus Systemic Treatments in Spain

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INTRODUCTION

- Atopic dermatitis (AD) is a chronic, inflammatory skin disease characterized by itchy, painful, and dry skin. Despite the great number of available therapies, economic evaluations are needed to provide evidence on their cost-efficiency to assist the National Health System (NHS) in decision-making.

OBJECTIVES

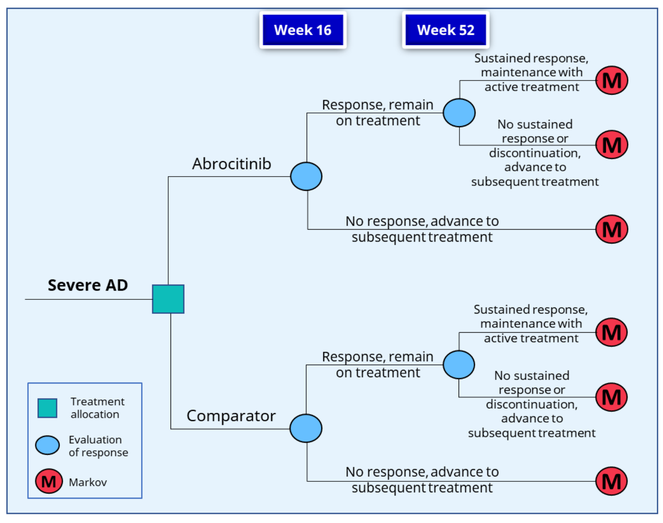
To evaluate the cost-effectiveness of abrocitinib (200mg) versus dupilumab (300mg), tralokinumab (300mg), baricitinib (2mg/4mg) and upadacitinib (15mg/30mg) in the treatment of adult patients with severe AD who are candidates for systemic treatments from the Spanish NHS perspective.

METHODS

Design

- A cost-effectiveness analysis was conducted by using a hybrid model composed of a decision tree (52-weeks) linked to a Markov model (remainder of the 5-year time horizon) programmed in Excel, with 6-month cycles (Figure 1).
- Patients were assigned to each treatment in the decision tree and response and discontinuation rates were assessed at 16 and 52 weeks. After 52 weeks patients entered the Markov model with three possible health states: maintenance with active therapy, subsequent treatment (in case of discontinuation or loss of response) and death (absorbing state).
- Response was assessed using a 75% reduction in baseline Eczema Area and Severity Index (EASI-75) score as a measure of efficacy.

Figure 1. Model structure (decision tree and Markov)



AD: atopic dermatitis

Parameters

- All data inputs were validated by three Spanish clinical experts.
- Key efficacy inputs used in the model included: time to onset of response, response at 16 and 52 weeks (decision tree), annual loss of treatment response (Markov model), and the discontinuation both in the year of treatment initiation and each year after that (decision tree and Markov model).
- Comparative efficacy data were obtained from a network meta-analysis[1] and randomised clinical trials[2-6] (Table 1). Utility values were extracted from the literature[7].

Table 1. Response rates (EASI-75) for the first 52 weeks

Response	Abrocitinib 200mg	Dupilumab 300mg	Tralokinumab 300mg	Baricitinib 2mg	Baricitinib 4mg	Upadacitinib 15mg	Upadacitinib 30mg
Week 16*	74.3%	61.5%	49.3%	41.3%	47.3%	67.7%	80.7%
Week 52**	94.7%	82.1%	82.1%***	82.9%†	92.1%‡	78.6%	89.5%

*Efficacy data are only available for the subgroup of adult patients with severe AD for abrocitinib and dupilumab. For comparators for which disaggregated data are unavailable for the adult-severe AD profile, the observed proportion of adult patients and change in response observed between patients with moderate-severe AD and those with severe AD is applied. For baricitinib and upadacitinib, the change from abrocitinib is applied, and for tralokinumab, the change from dupilumab is applied. **Response rate at week 52 for week-16 responders. ***The same rate as for dupilumab is assumed †Assumed to be the mean between the rate of abrocitinib 100mg and upadacitinib 15mg. ‡Assumed to be the mean between the rate of abrocitinib 200mg and upadacitinib 30mg.

- Loss of treatment response beyond 52 weeks was assumed to occur at the same rate observed between 16–52 weeks (derived with reference to the proportion of week 16 responders who sustained response at week 52).
- The treatment discontinuation rate was assumed to be the same for all comparators: 6.9% of patients discontinued during the first 52 weeks[4], and 6.3% discontinued each subsequent year[8].
- Unit costs (€, 2022 values) for drug acquisition and administration, adverse events (AE), testing, medical visits, hospitalisations, and subsequent treatment, were obtained from local sources[9,10]. Both costs and outcomes were discounted at a 3% per year[11,12].
- Subsequent treatment cost was estimated as an average cost between JAK inhibitor and biologic of higher price, resulting in €1,555.12 per month.
- The analysis was expressed as incremental cost-effectiveness ratio (ICER): incremental cost per quality-adjusted life year (QALY) gained (willingness-to-pay threshold: €25,000/QALY[13]). Deterministic and probabilistic sensitivity analyses (PSA) were performed.

Table 2. Cost inputs

Cost type	Abrocitinib 200mg	Dupilumab 300mg	Tralokinumab 150mg	Baricitinib 2mg	Baricitinib 4mg	Upadacitinib 15mg	Upadacitinib 30mg
Unit cost	€31.73/ tablet	€560.34/ syringe	€280.17/ syringe	€25.77/ tablet	€25.77/ tablet	€31.08/ tablet	€62.16/ tablet
Monthly cost	€965.71	€1,218.24	€1,218.24	€784.37	€784.37	€946.00	€1,892.00
Loading dose	-	€1,120.68	€1,120.68	-	-	-	-
Administration	-	€72.06	€72.06	-	-	-	-
Test	€394.28 (annual cost)						
AE	€83.86 (ophthalmology visit) for allergic conjunctivitis / €74.68 (dermatology visit) for all other AE						

Visits and hospitalisations by type of response	Hospitalisations	Emergency room	Primary care visits
Responders (annual cost)	€917.98	€161.03	€407.68
Non-responders (annual cost)	€1,529.97	€348.89	€881.92

Cost per number-needed-to-treat (NNT)

- Cost per NNT was calculated for abrocitinib and dupilumab based on EASI-75 responders from a post-hoc analysis of patients with severe AD from the JADE COMPARE study[14], as these are the unique treatments that have been compared in a head-to-head study.
- NNT for achieving an EASI-75 response was obtained using the difference in response for active treatment (abrocitinib or dupilumab) versus placebo at 12 weeks. The cost per NNT for each drug was obtained by multiplying the annual cost of each therapy over the first year of treatment by its NNT. Additionally, NNT for abrocitinib vs. dupilumab was calculated.

RESULTS

Cost-effectiveness

- Abrocitinib was dominant versus all comparators (dupilumab, tralokinumab, baricitinib 2mg and 4mg, and upadacitinib 15mg and 30mg), generating a QALYs gain with direct healthcare cost-savings, mainly explained by lower abrocitinib acquisition costs and lower medical visits and hospitalization costs for patients treated with abrocitinib. Abrocitinib also led to an increase in years in response (Table 3).

Table 3. Deterministic results

Results	Abrocitinib 200mg	Dupilumab 300mg	Tralokinumab 300mg	Baricitinib 2mg	Baricitinib 4mg	Upadacitinib 15mg	Upadacitinib 30mg
Years in response	2.74	1.68	1.34	1,21	1.66	1.82	2.69
Total QALYs	3.54	3.27	3.18	3.16	3.27	3.31	3.52
Total costs	€78,280	€92,264	€93,783	€86,190	€82,147	€84,303	€109,120
ΔCost	-	**-€13,984**	**-€15,503**	**-€7,910**	**-€3,867**	**-€6,023**	**-€30,839**
ΔQALYs	-	**0.27**	**0.35**	**0.37**	**0.27**	**0.22**	**0.01**
ICER	-	**Dominant**	**Dominant**	**Dominant**	**Dominant**	**Dominant**	**Dominant**

ICER: incremental cost-effectiveness ratio; QALYs: quality-adjusted life-years

- Sensitivity analyses confirmed the robustness of the results, showing that abrocitinib was dominant or cost-effective versus all comparators for most of the simulations performed, considering the WTP threshold of €25,000 per QALY gained.

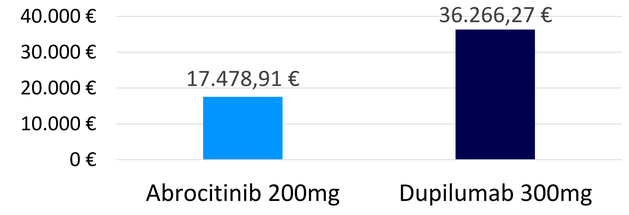
Table 4. PSA results

Results	Abrocitinib 200mg vs Dupilumab 300mg	Tralokinumab 300mg	Baricitinib 2mg	Baricitinib 4mg	Upadacitinib 15mg	Upadacitinib 30mg
Dominant	87.9%	88.8%	83.0%	66.8%	81.8%	49.5%
Cost-effective	0.3%	0.5%	5.7%	13.9%	2.3%	0.0%
Not cost-effective	0.0%	0.0%	0.5%	6.6%	1.1%	0.0%
Less costly, less effective	11.8%	10.7%	10.1%	7.9%	9.9%	50.5%
Dominated	0.0%	0.0%	0.7%	4.8%	4.9%	0.0%

NNT analysis

- NNT was 1.5 for abrocitinib 200mg and 2.3 for dupilumab versus placebo, and 4.4 for abrocitinib 200mg versus dupilumab (abrocitinib was dominant).

Figure 2. Cost per NNT for EASI-75 response



CONCLUSIONS

From the Spanish NHS perspective, abrocitinib is a dominant alternative versus currently available therapies for adults with severe atopic dermatitis.

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DISCLOSURE

This study was sponsored by Pfizer S.L.U. DA, IHM, VHLR, NL, CP, AdLJ and FR are employees of Pfizer S.L.U. AB, SAM and MP are employees of Outcomes'10 S.L. which received funding from Pfizer S.L.U. for the analysis.