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A COST-EFFECTIVENESS ANALYSIS OF SECUKINUMAB 300 MG VS CURRENT THERAPIES FOR THE TREATMENT OF MODERATE TO SEVERE PLAQUE PSORIASIS IN ITALY

D'AUSILIO A[1], AIELLO A[1], DANIEL F[1], GRAHAM C[2], ROCCIA A[3], TOUMI M[4]

[1]Creativ-Ceutical, Milano, Italy; [2]RTI Health Solutions, NC, NC, USA; [3]Novartis Farma, Origgio, Italy; [4]Aix-Marseille University, Marseille, France

INTRODUCTION

- Psoriasis is a common chronic, recurrent, immune mediated disease of the skin. The prevalence of psoriasis in Italy is estimated at 3.1% on the general population(1) and of these patients, 85% are diagnosed with plaque-type psoriasis (of which about ¼ has moderate to severe disease).
- Psoriasis is associated with significant clinical and emotional morbidity, particularly impacting patients' work and social lives and leading to reduced quality of life.(2) Moreover, increasing disease severity was found to have a negative impact on patients' quality of life (QoL). Patients with self-reported severe disease are almost 2-times more likely to consider their disease to cause substantial problem in their daily activities compared to those with moderate disease.(3)
- Standard commonly prescribed non-biologic systemic treatments for psoriasis in Italy include immunosuppressant treatments such as cyclosporine and methotrexate. These treatments are often used in combination with topical treatments and phototherapy. The use of non-biologic systemic agents as first-line therapy is however limited by cumulative toxicity and drug interactions.
- Several biologic systemic treatments are now approved and currently marketed in Italy for psoriasis, including Enbrel® (etanercept), Remicade® (infliximab), Humira® (adalimumab), and Stelara® (ustekinumab).
- Cosentyx® (secukinumab) is a fully human IgG1/κ monoclonal antibody that selectively binds to and neutralises the proinflammatory cytokine interleukin-17A (IL-17A). Secukinumab works by targeting IL-17A and inhibiting its interaction with the IL-17 receptor, which is expressed on various cell types including keratinocytes.(4)
- The safety and efficacy of secukinumab were assessed in several randomised, double-blind, phase III studies in patients with moderate to severe plaque psoriasis who were candidates for phototherapy or systemic therapy [ERASURE, FIXTURE, FEATURE, JUNCTURE and CLEAR].(5)
- Secukinumab 300mg/weekly month 1 and then every month afterwards was efficacious in systemic treatment-naive, biologic-naive, biologic/anti-TNF-exposed and biologic/anti-TNF-failure patients. Improvements in PASI 75 in patients with concurrent psoriatic arthritis at baseline were similar to those in the overall plaque psoriasis population. Secukinumab was associated with a fast onset of efficacy with a 50% reduction in mean PASI byWeek 3 for the 300 mg dose.(4)

OBJECTIVE

- The objective of this analysis was to examine the cost-effectiveness of secukinumab 300 mg (SEC300) compared with other systemic biologic drugs: adalimumab (ADA), etanercept (ETA), infliximab (INF), ustekinumab (UST) 45 and 90 mg, and standard of care (SOC - cyclosporine and methotrexate) for plaque psoriasis, in the Italian National Health System (NHS) setting.

METHODS

- A previous cost-utility model in MSExcel™ **(Figure 1)** Model (6) was adapted to the Italian NHS, using a bottomup approach, consistent with the methodology of the activity based costing.(12) The model was designed to consider the clinical benefits, resource use and costs related to SEC300 vs comparators.

Model structure and assumptions

- The Markovmodel is based on 4-week cycles for the first 52 weeks, followed by annual cycles.
- Health states and decision to switch therapy to SOC for first year are defined by PASI response.
- Year 2+: 3 health states; responders (PASI ≥75) continued with the active treatment until they switch to SoC due to the failure of the active treatment or death. Non-responders received SoC until death.
- A mixed-treatment comparison, using data from clinical trials, estimated the relative treatment effect and efficacy of SEC300 compared to ADA, ETN, INF and UST in patients with moderate to severe plaque psoriasis.(8)
- Treatment effect was entered in the model as the proportion of patients achieving a particular response at 4, 8, and 12 weeks.(8)
- A decision tree **(Figure1)** reflecting response to treatment (PASI change <50, 50-74, 75-89, ≥90) fed into a long-term Markov model with health states related to treatment continuation, dropout, and death.

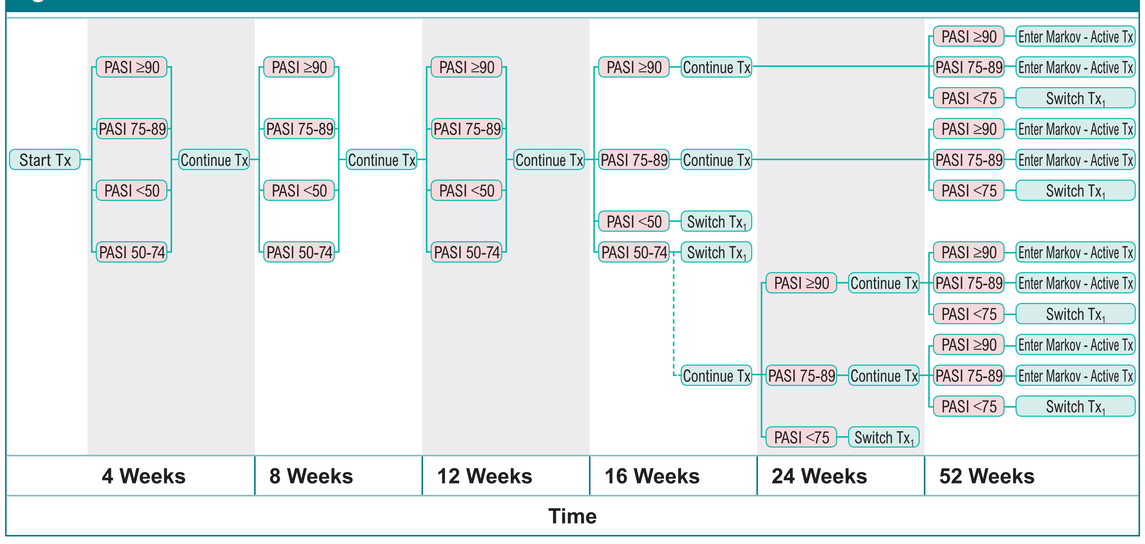
Model adaptation

- An expert panel of recognised Italian clinicians was interviewed through a structured questionnaire to gather information on: treatment pathways, health care resources consumption (routine visits and instrumental tests etc.), adverse events (3/4) management.
- Life years mortality and patient utility were adapted with Italian published data.(9)
- Health care resources consumption (pre-assessment evaluation before biological drug use, routine visits and laboratory/instrumental tests, management of adverse events) were valorised with national inpatient/ outpatients tariffs. For drugs, the maximum prices that NHS reimburses were considered (updated at September 2015).
- The time horizon of the model was 10 years therefore a 3% discount was applied to both costs and benefits according to Italian National Guidelines for Health Economics Evaluations.(10)

Sensitivity analysis

- To evaluate the robustness of the analysis two univariate sensitivity analyses were performed:
  - ✔ The first with a time horizon of 5 years.
  - ✔ The second using the price of the biosimilar for infliximab.

Figure 1. Model schematic



RESULTS

Base case

- In the model **(Table 1)** SEC300 has higher QALYs over the 10 year horizon, followed by UST. SEC300 has better results also for percentage of patients in PASI ≥75 and ≥90 and with a greater number of years in PASI≥90.

Table 1. Efficacy of therapies. Base Case: Time Horizon 10 years

	SOC	SEC300	UST90	UST45	ADA	ETN	INF
QALYs	5.00	5.82	5.47	5.47	5.36	5.40	5.52
Responders at 16 weeks:							
% Patients PASI ≥75	5.5%	88.7%	78.7%	78.7%	63.8%	62.2%	81.0%
% Patients PASI ≥90	1.0%	69.1%	53.2%	53.2%	35.9%	34.3%	56.5%
N. of weeks on biologic treatment	NA	241.4	207.3	208.3	176.1	189.3	221.8
Years in PASI ≥90	0.1	2.8	2.0	2.0	1.3	1.4	2.3

- According to Italian NHS prices, SEC300 shows the highest cost per patient (but very close to UST90 and UST45), while infliximab has the highest total cost per patient due to both direct drug and non-drug costs **(Table 2)**.
- At week 16, SEC300 shows the lowest cost per responder, for both PASI≥75 and PASI≥90 **(Table 2)**.

Table 2. Cost of therapies. Base Case: Time Horizon 10 years

	SOC	SEC300*	UST90	UST45	ADA	ETN	INF
Drug cost	1,205 €	52,530 €	51,292 €	51.549 €	38,604 €	38,785 €	66,076 €
Direct non-drug cost	41,180 €	24,119 €	24,888 €	24,815 €	27,649 €	26,880 €	25,357 €
Total Cost	42,385 €	76,649 €	76,180 €	76,364 €	66,253 €	65,665 €	91,433 €
Responders at 16 weeks:							
Cost per PASI ≥75 responder	NA	86,382 €	96,840 €	97,074 €	100,765 €	105,563 €	112,848 €
Cost per PASI ≥90 responder	NA	110,976 €	143,205 €	143,551 €	184,378 €	191,347 €	161,782 €

*Price still in negotiation

- In the Base Case, the model shows positive results for SEC300, with very favourable ICERs for the Italian setting vs every comparator, including the SOC.
- When comparing with INF, SEC300 is dominant (less costly and more effective). The ICERs vs other biologics range between €811/QALY and €26,081/QALY as shown in **Table 3**.

Table 3. Cost-effectiveness results. SEC300 vs Comparators Base Case: Time Horizon 10 years

	SOC	UST90	UST45	ADA	ETN	INF
△ Total Costs SEC300 vs Comparator	+ 34,265 €	+ 469 €	+ 285 €	+ 10,396 €	+10,984 €	14,784 €
△ Total QALY SEC300 vs Comparator	+ 0.82	+ 0.35	+ 0.35	+ 0.46	+ 0.42	+ 0.30
ICER SEC300 vs Comparator	41,947 €	1,322 €	811 €	22,501 €	26,081 €	Dominant

Sensitivity analysis: time horizon 5 years

- In the first sensitivity analysis with a shorter time horizon of five years **(Table 4)**, the model continue to shows good results for SEC300, vs every comparator, including Placebo/SOC, and continuing to be dominant vs INF.
- In general the ICERs vs other biologics (excluding INF) are very close to the previous ones, with a range between €2,744/QALY and €32,668/QALY **(Table 4)**.

Table 4. Cost-effectiveness results. SEC300 vs Comparators Base Case: Time Horizon 5 years

	SOC	UST90	UST45	ADA	ETN	INF
△ Total Costs SEC300 vs Comparator	+ 26,817 €	+ 611 €	+ 475 €	+ 8,182 €	+ 8,949 €	11,823 €
△ Total QALY SEC300 vs Comparator	+ 0.59	+ 0.22	+ 0.22	+ 0.31	+ 0.27	+ 0.18
ICER SEC300 vs Comparator	45,096 €	2,744 €	2,158 €	26,712 €	32,668 €	Dominant

Sensitivity analysis: biosimilar infliximab

- In the second analysis we used a lower price per INF, considering the imminent market entry of the biosimilar formulation on the Italian market. In this scenario we estimated a price reduction of about 25%.
- Despite the IFN price reduction, ICER is acceptable according to recommended range of Italian thresholds(10,11): €21,020/QALY at 10 years and €27,822/QALY at 5 years.

CONCLUSIONS

- The model shows that SEC300 is a cost-effective option when compared to other biologic agents, including INF biosimilar and SOC currently funded by NHS in Italy for the treatment of moderate-to-severe plaque psoriasis. Although the analysis was performed with limited follow-up (week 16), recent late-breaking data with SCULPTURE 3 years(13) are promising in confirming the cost-effectiveness advantage of SEC300.

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DISCLOSURE

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