Cost-effectiveness of Secukinumab in the Treatment of Ankylosing Spondylitis in Brazil

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INTRODUCTION

- Ankylosing Spondylitis (AS) is a chronic immune-mediated inflammatory disease characterized by inflammation, progressive irreversible structural damage and disability involving predominantly the axial skeleton that negatively impact health-related quality of life.[1]
- Individuals who do not respond to conventional treatments should be treated with biologic therapies.[2] Around 30% of AS patients treated with TNF inhibitor (TNFi) are considered intolerant or inadequate responders.[3-4] The patient adherence to TNFi agents is low, with up to 50% of AS patients switching their initial therapy within the first year.[5]
- Secukinumab is the first an only fully human monoclonal antibody that selectively neutralizes IL-17A, which has been proven significant efficacy in the treatment of AS, providing a rapid onset of action, long-lasting improvements and favorable safety profile.[6]

OBJECTIVE

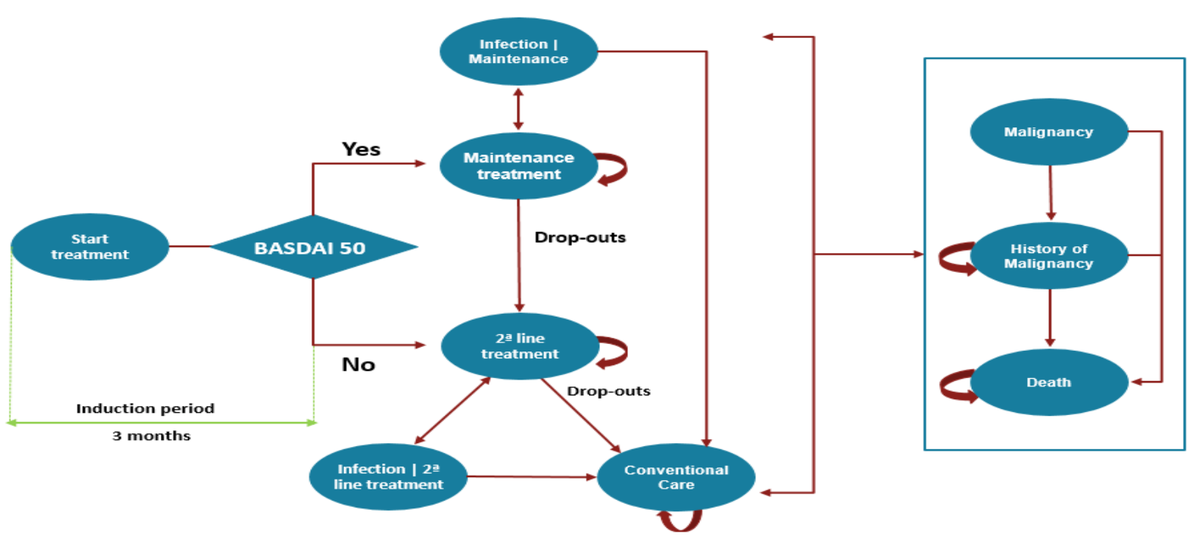
- This study aimed to estimate the cost-effectiveness of secukinumab 150 mg compared with other available biologic therapies in the treatment of AS, under the Brazilian Unified Health System (SUS) perspective.

METHODS

Model framework

- A previously developed semi-Markov model (Figure 1)[7,8] was adapted to the Brazilian setting to evaluate the cost-effectiveness of secukinumab 150 mg compared with adalimumab, certolizumab, etanercept, golimumab and infliximab in a biologic-naive population and a mixed population of biologic-naive and TNFi-experienced patients.

Figure 1. Markov model



- The primary response criterion in the model was to assess a 50% improvement in the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI 50) response at 3 months. Health states transitions were based on the probabilities of BASDAI 50 response rate, drop-out rate, chance of infections, malignancy and death.
- Efficacy inputs, including BASDAI 50 response rate and changes in Bath Ankylosing Spondylitis Functional Index (BASFI), were taken from a network meta-analysis.[7,9]
- The time horizon of the analysis was lifetime (40 years). Costs and benefits were discounted at 5% per year, as recommended by the national guideline.[10]
- Costs in the model included drug acquisition, relevant adverse effects and medical resources. Drug acquisition costs were estimated using the latest public price for government purchase. Benefits were expressed as quality-adjusted life-years (QALYs).
- Univariate and probabilistic sensitivity analyses were conducted on the key model input parameters to test their influence on the analysis results.

RESULTS

- The results indicated that in the biologic-naive population, secukinumab 150 mg was a dominant therapy compared to other biologics, achieving the highest QALYs (8.23) and the lowest cost (Brazilian real [BRL] 89,355) among all biologic drugs (costs ranging from BRL 89,440 to BRL 135,551 and benefits ranging from 7.43 to 8.16 QALYs) over the lifetime horizon (Table 1).
- In the mixed population, secukinumab 150 mg was dominant a therapy over all other biologic drugs, except when compared with etanercept, with secukinumab presenting higher costs and higher benefits (costs: BRL 88,968 vs. BRL 88,438; benefits: 8.09 QALYs vs. 7.38 QALYs), as shown in Table 1.
- Sensitivity analysis confirmed the favorable results of base case analysis, with secukinumab having the highest probability of achieving maximum net monetary benefit vs all comparators at various costs thresholds (Figure 2).

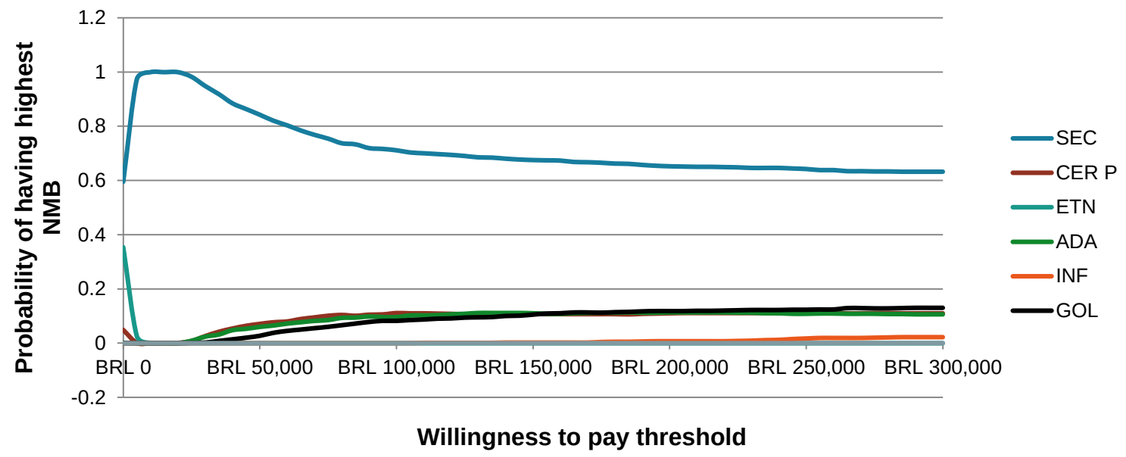
Table 1. QALY, total costs and ICER in biologic-naive and mixed population

Treatment	QALY	Total costs (BRL)	ICER (secukinumab vs. comparator)
Biologic-naive population			
Secukinumab 150 mg	8.226	89,355	-
Adalimumab	7.859	99,480	Secukinumab dominates
Certolizumab pegol	7.930	96,704	Secukinumab dominates
Etanercept	7.430	89,440	Secukinumab dominates
Golimumab	8.161	107,453	Secukinumab dominates
Infliximab	7.983	135,551	Secukinumab dominates
Mixed population (biologic-naive and TNFi-experienced patients)			
Secukinumab 150mg	8.090	88,968	-
Adalimumab	7.783	97,797	Secukinumab dominates
Certolizumab pegol	7.724	100,508	Secukinumab dominates
Etanercept	7.380	88,438	BRL 746/QALY
Golimumab	8.082	105,091	Secukinumab dominates
Infliximab	8.009	134,241	Secukinumab dominates

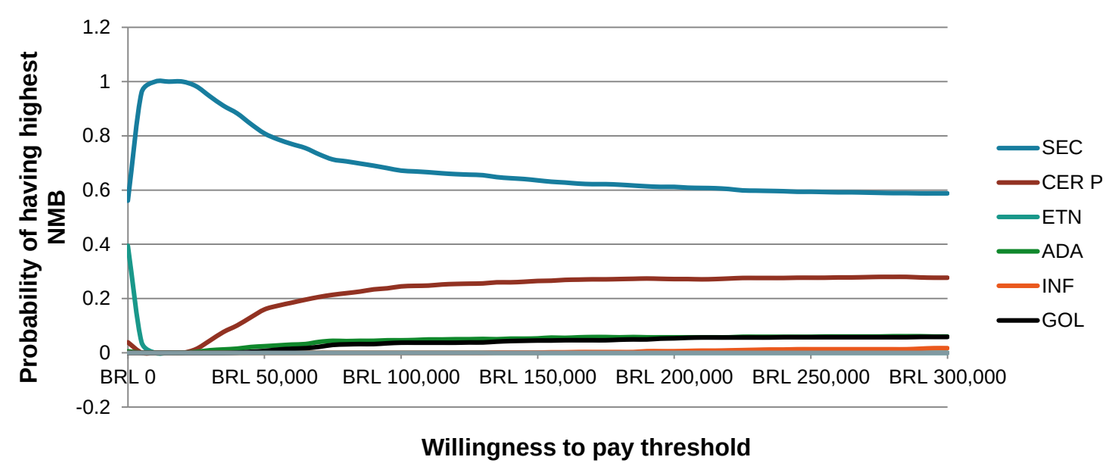
ICER: incremental cost-effectiveness ratio; QALY: quality-adjusted life year.

Figure 2. Probability of net monetary benefit of AS treatments at different willingness to pay thresholds in biologic-naive and mixed population

Biologic-naive population



Mixed population (biologic-naive and TNFi-experienced patients)



ADA: adalimumab; AS: ankylosing spondylitis; CER P: certolizumab pegol; ETN: etanercept; GOL: golimumab; INF: infliximab; NMB: net monetary benefit; SEC: secukinumab 150 mg.

LIMITATIONS

- There might be uncertainties on long-term efficacy of secukinumab, since the effectiveness data is derived from the NMA, which included data up to week 16.[9] However, long-term efficacy data has shown response sustainability up to 5 years.[11]

CONCLUSION

- Secukinumab is the most cost-effective alternative when compared with other biologic agents for patients with AS in Brazil.

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