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Budget Impact Analysis of Ixekizumab for the Treatment of Ankylosing Spondylitis

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INTRODUCTION

- Ankylosing spondylitis (AS) is a chronic, inflammatory disease that primarily affect the spine[1] . In more advanced cases, fusion of the spine sections will form leading to patients' immobility [2]. It affects between 0.1% to 1.4% of the populations globally [3]. The progressive symptoms of AS lead to physical and physiological burden and ultimately decreased health-related quality of life (HRQoL) [4] .
- Guidelines recommend tumor necrosis factor alpha inhibitors (anti-TNFs) and interleukin 17A (IL-17A) inhibitors ,as second line therapy, to attenuates the inflammatory reaction of the AS [5]. Secukinumab was the first IL-17A inhibitor, followed by ixekizumab. Both IL-17A inhibitors have very similar efficacy and safety profiles and are used in cases with anti-TNFs failure or intolerance [6].
- Both IL-17A inhibitors are costly treatments that increase the direct medical cost. However, two cost effectiveness analysis performed in the UK and Spain found that ixekizumab provided more quality-adjusted life-years (QALYs) in patients with active psoriatic arthritis and concomitant moderate-to-severe plaque psoriasis [7,8] .

OBJECTIVES

This analysis aimed to estimate the budget impact of the introduction of ixekizumab in the formulary of King Saud University and Medical City (KSUMC) over a 3-year time horizon for the management of adult with AS who failed in the first biologics treatment from the perspective of payers in KSUMC in Saudi Arabia.

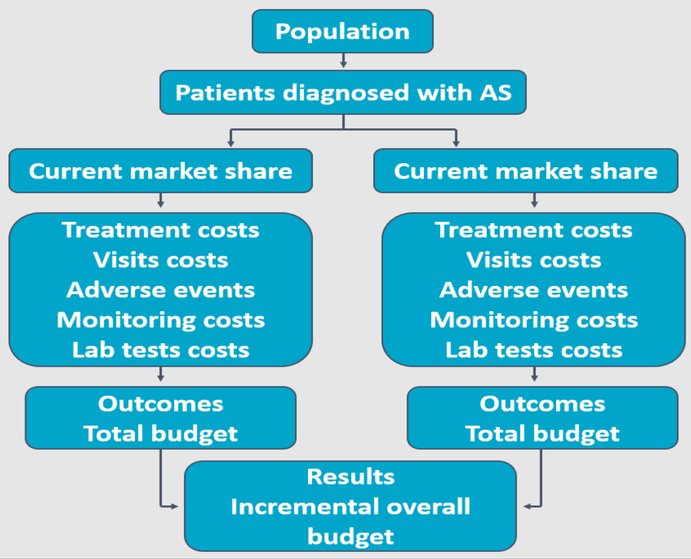
METHODS

- An excel-based budget impact model was developed to evaluate the budgetary impact of adopting ixekizumab into the currently approved and reimbursed treatments for AS. The analysis was conducted from the perspective of payers in KSUMC over a 3-year timeframe.
- The study was approved by the institutional review board of KSUMC (E-21-6315).
- All model inputs were developed in accordance with data retrieved from KSUMC electronic database, and data from the literature that were validated by experts in AS.
- The costs for 2021 in Saudi Riyals (SAR) were obtained from the National Tender list (NUPCO) for the medications, and from KSUMC business center for medical resources.

Modelling framework

- The budget impact model calculated the annual budget impact of introducing ixekizumab in the current KSUMC formulary list based on two scenarios:
  - Current scenario: without ixekizumab
  - Projected scenario: with ixekizumab
- The model assessed the budget impact of introducing ixekizumab in two patient groups: those who had failed anti-TNFs and those who had failed secukinumab; the net budget included the combined impact of both groups (Figure 1). One way sensitivity analysis was performed by varying inputs by 20%.

Figure 1: Model Structure



RESULTS

Main findings:

The cumulative cost for the scenario with ixekizumab was higher than the cost for the scenario without ixekizumab (SAR 13.5 million vs. SAR 7.6 million), resulting in a net cost spending of approximately SAR 5.8 million over a three-year time horizon (Table 1). The annual net budget impact of the two scenarios ranged from SAR 1.9 million in year one to SAR 2 million in year three.

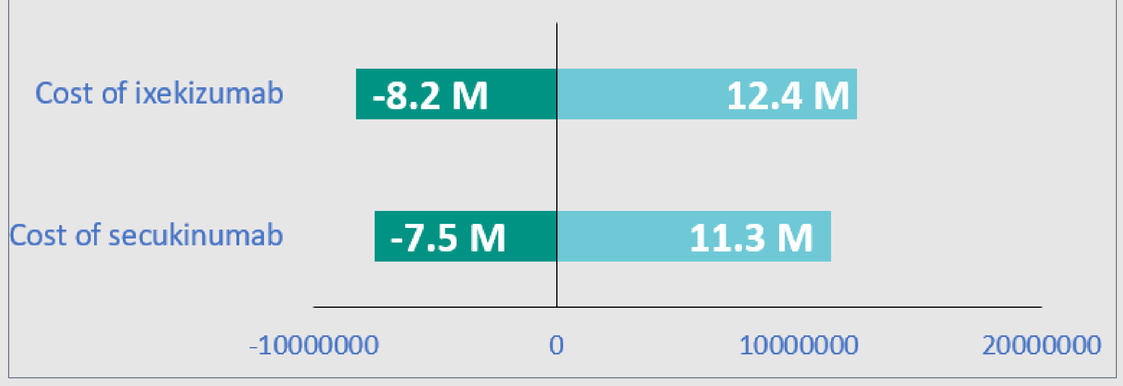
Table 1: Net-budget Impact Over a Period of 3 Years

Scenario	Year 1	Year 2	Year 3	Total
Without ixekizumab	SAR2,960,280	SAR2,333,400	SAR2,333,400	SAR7,627,080
With ixekizumab	SAR4,889,310	SAR4,297,200	SAR4,297,200	SAR13,483,710
Net budget impact	-SAR1,929,030	-SAR1,963,800	-SAR1,963,800	-SAR5,856,630

One-Way Sensitivity Analysis:

The sensitivity analysis indicated that the model was most sensitive to the drug acquisition cost per year of the ixekizumab regimen (Figure 2). The maximum potential budget impact, observed when the cost of ixekizumab was increased by 20%.

Figure 2: Tornado Diagram for One-way Sensitivity Analysis



DISCUSSION & CONCLUSION

This model calculated the budget impact of introducing ixekizumab on the KSUMC formulary list as a second IL-17 inhibitor for AS adult patients who failed anti-TNFs and secukinumab treatment over a three-year period. The budget impact result in a cost spending of SAR 5.8 million in three years and the acquisition cost was the main driver in the sensitivity analysis. As literature found that ixekizumab is a cost-effective treatment, it provides patients who failed previously available biologics in KSUMC with a new treatment option to manage AS.

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