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COST-EFFECTIVENESS ANALYSIS OF UPADACITINIB AS A TREATMENT OPTION FOR PATIENTS WITH RHEUMATOID ARTHRITIS IN THE KINGDOM OF SAUDI ARABIA

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OBJECTIVE

To evaluate cost-effectiveness of upadacitinib (ts-DMARD) as 1st-line treatment (1L) versus current treatment pathway among patients with RA in the KSA, who had inadequate response to prior conventional-DMARDs and/or biologic-DMARDs from the societal (includes indirect costs) perspective

CONCLUSIONS

Upadacitinib as 1st line treatment for the management of patients with moderate-to-severe RA projects improved health outcomes at lower budget over 10-year time horizon compared to the current treatment pathway.

Upadacitinib may bring significant reduction in healthcare-resources utilization in KSA, majorly due to reduced cost of drug-administration, monitoring, hospitalization, surgical-cost, and indirect-costs (productivity loss).

Although the current cost effectiveness analysis doesn't estimate cost savings with adalimumab-originator as 2nd-line treatment for patients with moderate RA, it is perceived that this will not offset the use of adalimumab-originator over adalimumab-biosimilar.

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INTRODUCTION

- Rheumatoid Arthritis (RA) is a chronic inflammatory disease characterized by symmetrical inflammation of synovial joints with higher comorbidity and mortality rates.[1,2]
- In the Kingdom of Saudi Arabia (KSA), the prevalence of RA is estimated to be 2.2 per thousand people.[3]
- The aim of RA management is to achieve remission or reduction of disease activity.[4,5]
- More recently, the targeted synthetic disease modifying anti-rheumatic drugs (ts-DMARDs) such as upadacitinib have emerged as an alternative advanced treatment option in RA. Upadacitinib has demonstrated significantly higher rates of remission and low disease activity in all its pivotal trials. [6]
- However, the advantages of low disease activity, which might seem self-evident to the rheumatologists at large, are yet to be perceived and still evolving among other stakeholders.[7,8]

METHODS

- Over a 10-year time horizon in a cohort size of 100 patients, Cost-Effectiveness Model (CEM) analyzed current KSA market for two scenarios:
  - Scenario 1: Current treatment pathway (1L: adalimumab-originator/biosimilar, 2L: other biologic-DMARDs/tofacitinib) Versus New treatment pathway (1L: upadacitinib, 2L: adalimumab-biosimilar)
  - Scenario 2: Current treatment pathway (1L: adalimumab-originator/biosimilar, 2L: other biologic-DMARDs/tofacitinib) Versus Alternate treatment pathway (1L: upadacitinib, 2L: adalimumab-originator)
- Inputs were retrieved from literature and/or obtained from interviews with key experts.

Table 1: Key Model Elements for Upadacitinib CEM

Elements	Inputs
Discounting	3.0% Costs, 3.0% Health outcomes
Treatment success criteria	First line treatment: Remission (DAS28 < 2.6) Second line treatment: Low Disease Activity (DAS28 < 3.2)
Model inputs	Market shares, efficacy inputs of current treatment agents, and cost inputs such as total direct-costs (cost for drug-acquisition, drug-administration, monitoring, hospitalization, and surgical-cost) as well as indirect-costs (such as productivity loss).
Model outcomes	Total costs (direct-costs and indirect-costs), quality-adjusted life-years (QALYs), hospitalization days, number of orthopedic surgeries, and incremental cost-utility ratio (ICUR) per QALY.

DAS: Disease Activity Score; DMARDs: Disease modifying anti-rheumatic drugs; RA: Rheumatoid Arthritis; SAR: Saudi Riyal

RESULTS

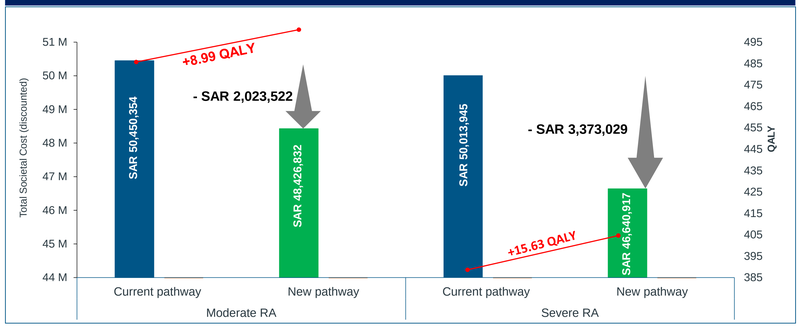
Scenario 1: Current Treatment Pathway vs. New Treatment Pathway

- New treatment pathway among moderate and severe RA patients leads to higher QALYs gain (+8.99 and +15.63) at lower societal-cost (cost difference: -SAR 2,023,522 and -SAR 3,373,029) (Figures 2, Table 2).
- Thus, as 1L, upadacitinib projects 'dominant' ICUR per QALY over current treatment pathway (Table 2).
- Also, new treatment pathway projects reduced hospitalization days (-14.83 and -11.41) and reduced number of orthopedic surgeries (-8.36 and -6.54) among moderate and severe RA patients, respectively (Table 2).

Scenario 2: Current Treatment Pathway vs. Alternate Treatment Pathway

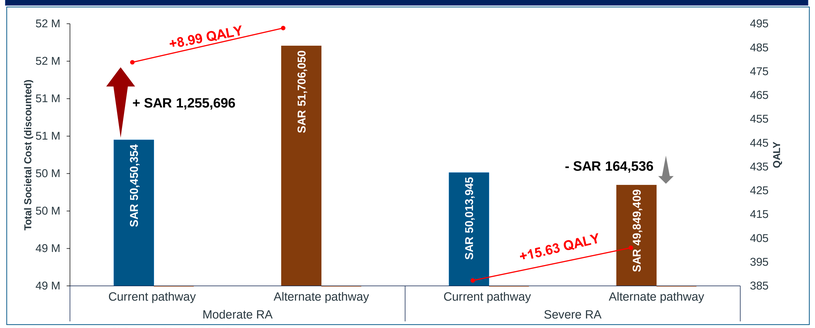
- Alternate treatment pathway projects 'dominant' ICUR per QALY for patient with severe RA (QALY gain: +15.63, societal cost difference: -SAR 164,536) (Figure 3, Table 3).
- However, for moderate RA, it is associated with additional societal cost of SAR 1,255,696 for improved QALY (+8.99) over current treatment pathway (ICUR per QALY: SAR 139,742) (Figure 3, Table 3).
- Overall, the alternate treatment pathway projects reduced hospitalization days (-14.83 and -11.41) and reduced number of orthopedic surgeries (-8.36 and -6.54) among moderate and severe RA patients, respectively (Table 3).

Figure 2: Total Societal Cost and QALY with Upadacitinib - Scenario 1 (Discounted)



QALY: Quality-adjusted Life-year; RA: Rheumatoid Arthritis; SAR: Saudi Riyal

Figure 3: Total Societal Cost and QALY with Upadacitinib - Scenario 2 (Discounted)



QALY: Quality-adjusted Life-year; RA: Rheumatoid Arthritis; SAR: Saudi Riyal

Table 2: Health Outcomes with Upadacitinib - Scenario 1 (Discounted)

Health outcomes	Current Treatment Pathway	New Treatment Pathway	Incremental
Moderate RA			
QALYs	479.04	488.03	+8.99
Hospitalization Days	239.73	224.90	-14.83
No. of Orthopaedic surgeries	122.65	114.29	-8.36
ICUR per QALY			**Dominant**
Severe RA			
QALYs	386.77	402.40	+15.63
Hospitalization Days	217.78	206.37	-11.41
No. of Orthopaedic surgeries	111.11	104.57	-6.54
ICUR per QALY			**Dominant**

Table 3: Health Outcomes with Upadacitinib - Scenario 2 (Discounted)

Health outcomes	Current Treatment Pathway	Alternate Treatment Pathway	Incremental
Moderate RA			
QALYs	479.04	488.03	+8.99
Hospitalization Days	239.73	224.90	-14.83
No. of Orthopaedic surgeries	122.65	114.29	-8.36
ICUR per QALY			**SAR 139,742**
Severe RA			
QALYs	386.77	402.40	+15.63
Hospitalization Days	217.78	206.37	-11.41
No. of Orthopaedic surgeries	111.11	104.57	-6.54
ICUR per QALY			**Dominant**

ICUR: Incremental cost-utility ratio; QALY: Quality-adjusted Life-year; RA: Rheumatoid Arthritis; SAR: Saudi Riyal