EE329

Budget impact analysis of adding risankizumab and upadacitinib for the treatment of inflammatory bowel disease in the Kingdom of Saudi Arabia

Mahmoud Mosli[1], Abdulelah Almutairdi[2], Abdulrahman Al khurmi[3], Ahmed Nader Fasseeh[4], Ahmed Abd-El Aziz[5], Ahmed Jaheen[6], Ali Anwar[7], Baher Elezbawy[8], Bandar Al harbi[9], Esraa Al Tawil[10], Hana Alabdulkarim[11], Hussain Alqasim[12], Islam Eldeeb[6], Kareem Ahmed El-Fass[8], Layla Alanizy[13], Mohamed Tannira[14], Rayd Almehizia[2], Sherif Abaza[5], Wael Iskandarani[6], Zoltán Kaló[15]

[1]King Abdulaziz University, Jeddah, Saudi Arabia, [2]King Faisal Specialist Hospital & Research Centre, Riyadh, Saudi Arabia, [3]National Guard Health Affairs, Riyadh, Saudi Arabia, [4]a) Faculty of Pharmacy, Alexandria University; b) Syreon Middle East, Alexandria, Egypt, [5]Syreon Middle East, Cairo, Egypt, [6]AbbVie Biopharmaceuticals GmbH, Riyadh, Saudi Arabia, [7]AbbVie Biopharmaceuticals GmbH, Jeddah, Saudi Arabia, [8]Syreon Middle East, Alexandria, Egypt, [9]Price Sultan Military Medical City, Riyadh, Saudi Arabia, [10]King Saud University Medical City, Riyadh, Saudi Arabia, [111]. National Guard Health Affairs, Riyadh, Saudi Arabia 2.Doctoral School of Applied Informatics and Applied Mathematics, Óbuda University, Budapest, Hungary, [12]King Fahad Specialist Hospital, Dammam, Saudi Arabia, [13]King Fahd Medical City, Riyadh, Saudi Arabia, [14]AbbVie Biopharmaceuticals GmbH, Dubai, United Arab Emirates, [151]. Semmelweis University, Center for Health Technology Assessment; 2. Syreon Research Institute, Budapest, Hungary

OBJECTIVE

We aim to estimate the budget impact of adding upadacitinib and risankizumab for ulcerative colitis (UC) and Crohn's disease (CD) patients, respectively, to the current treatment options of advanced therapies available in the Kingdom of Saudi Arabia (KSA).

CONCLUSIONS

Introducing upadacitinib for ulcerative colitis (UC) patients and risankizumab for Crohn's disease (CD) patients would lead to treatment cost savings over five years.

In real practice, starting and ending maintenance doses of advanced therapies for UC and CD are adjusted (mostly to higher than the label doses).

AbbVie and the authors thank the participants.

Disclosure: Mahmoud Mosli has served as a consultant to AbbVie and has received research funding and speaker fees from AbbVie. Abdulelah Almutairdi is a speaker and advisory honoraria from Janssen, Abbvie, Takeda, Pfizer, Bristol Meyers Squibb, Abdulrahman Al khurmi, Bandar Al harbi, Esraa Al Tawil, Hana Alabdulkarim, Hussain Alqasim, Layla Alanizy, Rayd Almehizia have nothing to disclose. Zoltán Kaló, Sherif Abaza, and Ahmad Nader Fasseeh are shareholders in Syreon Middle East. Ahmed Abdel Aziz, Baher Elezbawy, and Kareem Ahmed El-Fass are full-time employees of Syreon Middle East. Ali Anwar, Ahmed Jaheen, Wael Iskanadarani, Islam Eldeeb, and Mohamed Tannira are full-time employees at AbbVie Biopharmaceuticals GmbH and may hold company's shares.

Acknowledgements: The authors would like to thank all contributors for their commitment and dedication to developing this model. The authors would like to acknowledge the writing assistance provided by Syreon Middle East and statistical analysis support provided by Syreon Middle East, which AbbVie funded. The authors are fully responsible for all content and editorial decisions, were involved at all stages of Abstract development, and have approved the final version.

To submit a medical question, please visit www.abbviemedinfo.com

INTRODUCTION

Inflammatory bowel disease, with its main types, ulcerative colitis (UC) and Crohn's disease (CD), affects millions worldwide. Advanced therapies have transformed the treatment of UC and CD, yet optimal therapy often requires maintenance doses higher than their label doses. Thus, the reimbursement funds required for advanced therapies may be substantially underestimated by payers who rely on label doses for treatment cost estimation. We aim to estimate the budget impacts of adding upadacitinib (UPA) and risankizumab (RISA) for UC and CD patients, respectively, to the current treatment options available in the Kingdom of Saudi Arabia (KSA).

METHODS

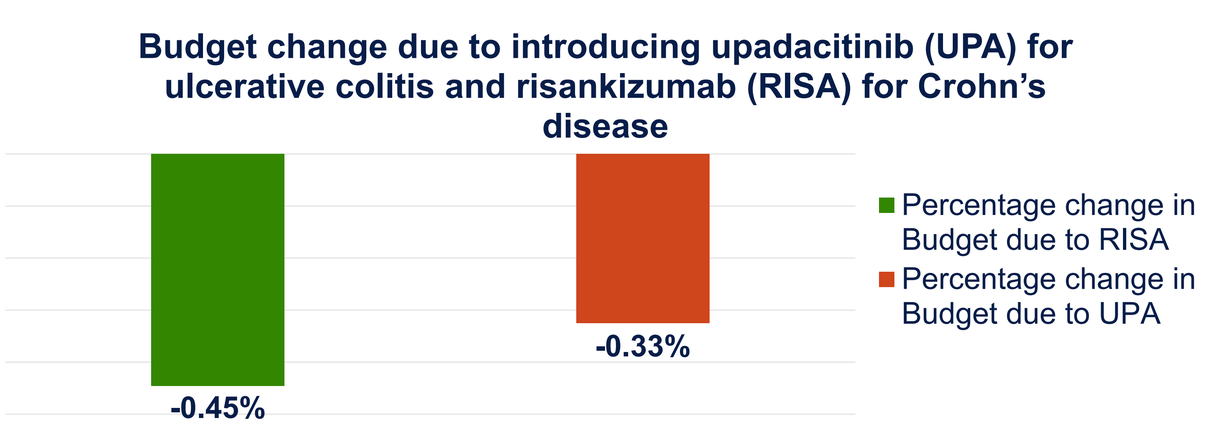
We built a five-year budget impact model to estimate the effect on the healthcare payer's budget in KSA. Initially, a patient-level simulation estimates the average monthly cost per patient. Subsequently, a budget impact model estimates the incremental treatment cost between the current advanced therapy treatment mix and the new mix after introducing upadacitinib and risankizumab.

The model accounts for patients' complex pathways during treatment, including induction, maintenance dose adjustments, discontinuation, switching, re-induction, and death. The individual patient simulation involved 20,000 patients. This number was chosen as the best compromise of minimized variation and computational feasibility. Two rounds of interviews were conducted with local experts to collect data on local dose adjustment practices. Medications included in both the UC and CD current mix include infliximab, adalimumab, vedolizumab, and ustekinumab. While certolizumab was included in the CD mix, golimumab and tofacitinib were included in the UC treatment mix.

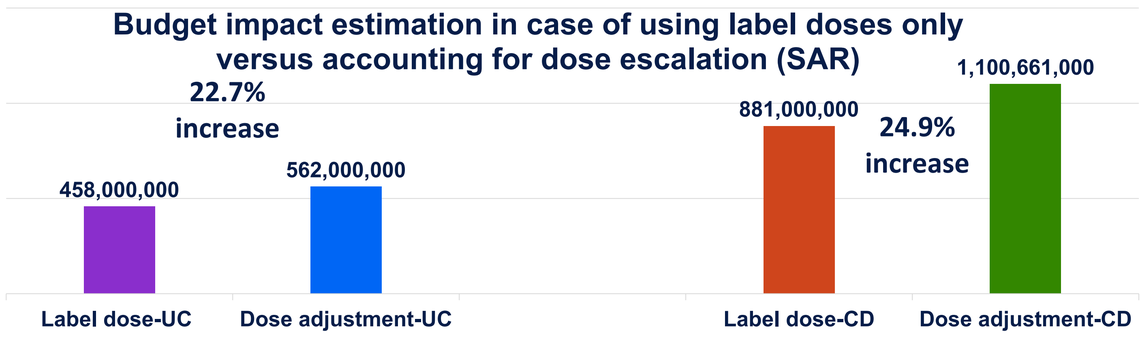
The patient population included in the model was moderate-to-severe UC and CD patients. The model is designed from the perspective of the budget holder. The model was validated by reverse engineering, using transition probability matrices to check for errors and correct them. All the costs were calculated in Saudi Riyal (SAR). Prices used in the model were taken from the Saudi Food and Drug Authority (SFDA)-registered prices (January 2023). Risankizumab prices were estimated following the registration process in SFDA.

RESULTS

Over five years, from the budget holder perspective in KSA, incorporating upadacitinib for UC patients led to a 0.33% saving in treatment costs, while adding risankizumab for CD patients led to a 0.45% saving in treatment costs.



Based on the interviews, all drugs for CD and UC had dose adjustments in practice. Model estimates revealed that the treatment cost considering dose adjustments was more than 20% higher than that with the label dose.



In the tables below, we demonstrate the results of dose adjustment as per the interviews with Saudi UC and CD experts.

Common doses used and dose adjustment of advanced therapies used for UC

	Adalimumab		Golimumab		Infliximab		Ustekinumab		Vedolizumab		Tofacitinib	
Starting doses	Doses	%	Doses	%	Doses	%	Doses	%	Doses	%	Doses	%
	40 mg/2wk	98%	50 mg/4wk	34%	5 mg/kg/8wk	89%	90 mg/8wk	81%	300 mg/8wk	95%	10 mg/12hr	45%
	40 mg/1wk	2%	100 mg/4wk	66%	5 mg/Kg/4wk	2%	90 mg/6wk	6%	300 mg/4wk	5%	5 mg/12hr	47%
					10 mg/Kg/4wk	6%	90 mg/12wk	1%			20 mg/12hr	5%
					10 mg/Kg/8wk	3%	90 mg/4wk	11%			22mg/24hr	2%
											11mg/24 hr	0%
Average daily maintenance	2.9 mg/day		2.97 mg/day		0.11 mg/kg/day		1.82 mg/day		5.63 mg/day		16.4 mg/day	
Ending doses	Doses	%	Doses	%	Doses	%	Doses	%	Doses	%	Doses	%
	40 mg/1wk	39%	100 mg/4wk	70%	5 mg/Kg/ 8wk	44%	90 mg/6wk	15%	300 mg/8wk	64%	10 mg/12hr	61%
	40 mg/2wk	57%	100 mg/2wk	15%	10 mg/Kg/8wk	21%	90 mg/8wk	52%	300 mg/4wk	31%	5 mg/12hr	36%
	50mg/2wk	2%	50 mg/4wk	15%	5 mg/Kg/6wk	9%	90 mg/4wk	32%	300 mg/6wk	5%	20 mg/12hr	0%
	20 mg/1wk	0%			10 mg/kg/6wk	3%	90 mg/12wk	0%	108mg/2wk	0%	22mg/24hr	2%
	80mg/2wk	1%			5 mg/Kg/4wk	9%					11mg/24 hr	2%
					5 mg/Kg /5wk	0%						
					10 mg/Kg /4wk	14%						
Average daily maintenance	4.01 mg/day		3.84 mg/day		0.16 mg/kg/day		2.21 mg/day		7.11 mg/day		16.29 mg/day	
Average time to dose escalation (weeks)	36		15		45		36		34		22	
Percentage change in dose	38%		29%		45%		22%		26%		-1%	

Common doses used and dose adjustment of advanced therapies used for CD

	Ustekinumab		Infliximab		Adalimumab		Vedolizumab		Certolizumab	
Starting doses	Doses	%	Doses	%	Doses	%	Doses	%	Doses	%
	90 mg/8wk	82%	5 mg/kg/8wk	82%	40 mg/2wk	98%	300 mg/8wk	96%	400 mg/4wk	95%
	90 mg/4wk	16%	10 mg/kg/8wk	9%	40 mg/1wk	2%	300 mg/4wk	4%	400 mg/2wk	5%
	90 mg/12wk	2%	5 mg/kg/4wk	3%			108mg/2wk	0%	200 mg/2wk	0%
	90 mg/6wk	0%	10 mg/kg/6wk	3%						
			10 mg/kg/4wk	3%						
			5 mg/kg/6wk	0.17%						
Average daily maintenance	1.86 mg/day		0.11 mg/kg/day		2.9 mg/day		5.57 mg/day		14.96 mg/day	
Ending doses	Doses	%	Doses	%	Doses	%	Doses	%	Doses	%
	90 mg/8wk	59%	5 mg/kg/8wk	46%	40 mg/2wk	57%	300 mg/8wk	61%	400mg/4wk	90%
	90 mg/4wk	32%	10 mg/kg/8wk	16%	40 mg/1wk	35%	300 mg/4wk	36%	400mg/2wk	5%
	45 mg/8wk	0%	5 mg/kg/6wk	6%	80 mg/2wk	5%	300 mg/6wk	4%	200mg/2wk	5%
	90 mg/12wk	1%	10 mg/kg/4wk	19%	60 mg/2wk	1%	108mg/2wk	0%		
	63 mg/8wk	0%	10 mg/kg/6wk	5%	52 mg/2wk	0.20%				
	72 mg/8wk	1%	5 mg/kg/4wk	8%	48 mg/2wk	0.10%				
	108 mg/8wk	0%			32 mg/2wk	0.20%				
	90 mg/6wk	6%			28 mg/2wk	0.10%				
	90 mg/2wk	1%			20 mg/2wk	0.20%				
					80 mg/1wk	1%				
Average daily maintenance	2.2 mg/day		0.17 mg/kg/day		4.11 mg/day		7.33 mg/day		15.06 mg/day	
Average time to dose escalation (weeks)	42		51		36		30		34	
Percentage change in dose	19%		52%		42%		32%		1%	

The budget impact of adding upadacitinib to the current UC treatment mix varies over time. In the first two years, upadacitinib is associated with additional costs. However, cost savings begin to accrue in year three, and these savings increase in years four and five. Moreover, the budget impact of adding risankizumab to the current CD treatment mix leads to cost savings starting from year one, and the cost savings increase thereafter to year five.