Costs for Treating Patients With Ulcerative Colitis With Vedolizumab or Adalimumab Based on Endoscopic Improvement Data From the VARSITY Trial

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Background

- Ulcerative colitis (UC) is a chronic inflammatory disease with an estimated prevalence in the USA of over 180 per 100,000 adults in 2016, showing a steady increase since 2007¹
- Many factors contribute to the high costs associated with treating patients with UC, such as long-term use of medication, intermittent periods of hospitalization and, in more severe and uncontrolled cases, the need for colectomy^{2,3}
- Endoscopic improvement has been linked to reduced colectomy rates^{4,5}
- In the phase 3b, randomized, active-controlled VARSITY trial in patients with moderate to severe UC, a greater proportion of patients treated with vedolizumab experienced endoscopic improvement than those treated with adalimumab; however, the cost implications of this are unknown

Aim

 To inform decision-makers in choice of treatments, we produced a model of projected mean costs for treating patients with moderate to severe UC with either vedolizumab or adalimumab

Methods

Figure 1. Model structure

colitis

- We developed a Monte Carlo simulation model (Figure 1) using the model inputs described in Table 1
- Endoscopic improvement at week 52 was taken from the VARSITY trial (NCT02497469), which defined endoscopic improvement as a Mayo endoscopic sub-score of 0 or 16
- The model estimated the mean cost (in US\$) for a US patient from a cohort of 10,000 over a 1-year period from a payer's perspective and accounted for discontinuation of treatment due to lack of response with response defined as endoscopic improvement

Vedolizumab

 Scenarios based on the proportion of patients with endoscopic improvement were evaluated, and sensitivity analyses with inputs varying by ± 20% were performed to test model parameters

Table 1. Model inputs

Input parameter	Value
Proportion of patients with endoscopic improvement,6 %	
Vedolizumab	39.7
Adalimumab	27.7
Proportion of surgery-free patients,7 %	
With endoscopic improvement	96.5
Without endoscopic improvement	86.1
Drug cost per patient,* US\$	
With endoscopic improvement	
Vedolizumab [†]	60,133
Adalimumab [‡]	89,523
Without endoscopic improvement	
Vedolizumab [†]	22,550
Adalimumab [‡]	35,809
Colectomy cost per patient, ^{2,§} US\$	103,248

the 2020 InHealth Physicians' Fee and Coding Guide⁹), including wastage.

†The model assumes intravenous administration of vedolizumab in a clinic over 30 minutes. Patients received 300 mg at day 1 and at weeks 2 and 6; patients with endoscopic improvement received 300 mg every 8 weeks from week 14.

‡The model assumes self-administration of subcutaneous adalimumab. Patients received 160 mg on day 1, 80 mg on day 15 and 40 mg on days 29 and 43; patients with endoscopic improvement received 40 mg every 14 days for the remainder of the year.

§Costs in this model reflect annual incremental costs for patients with UC undergoing colectomy. Colectomy cost was reported in

Results

UC, ulcerative colitis.

Endoscopic improvement

No endoscopic improvement

indoscopic improvement

2017 US\$ and was inflated to 2020 US\$.

- Mean total costs (Figure 2) included mean drug and colectomy costs, which were estimated to be \$37,564 and \$10,036 for vedolizumab, and \$50,570 and \$11,353 for adalimumab, respectively
- In the base case, the colectomy rate for patients treated with vedolizumab was estimated to be lower than for those treated with adalimumab (**Table 2**)
- When the proportions of patients with endoscopic improvement were equivalent for the two treatments, the probability of savings was estimated to be greater for vedolizumab versus adalimumab (**Table 2**)
- One-way sensitivity analyses demonstrated that results were most sensitive to changes in drug prices and endoscopic improvement rates (Figure 3)

Colectomy

No colectomy

Colectomy

No colectomy

Colectomy

Colectomy

Summary and Conclusions

- The high economic burden associated with UC highlights the need for cost-effective management strategies
- Over the course of a year, our simulation suggests a cost saving associated with the use of vedolizumab versus adalimumab
- Better endoscopic improvement, which resulted in lower colectomy rates, contributed to lower costs, with additional savings from lower acquisition costs with vedolizumab than with adalimumab
- These data highlight the economic benefit of endoscopic improvement in addition to clinical remission in managing patients with UC and may help to inform formulary decision-making

References

Cost

Cost

Cost

─ No cost

─ No cost

No cost

Cost

No cost

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Disclosures

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Results (continued)

Error bars indicate the range across 10,000 individual simulated patients.

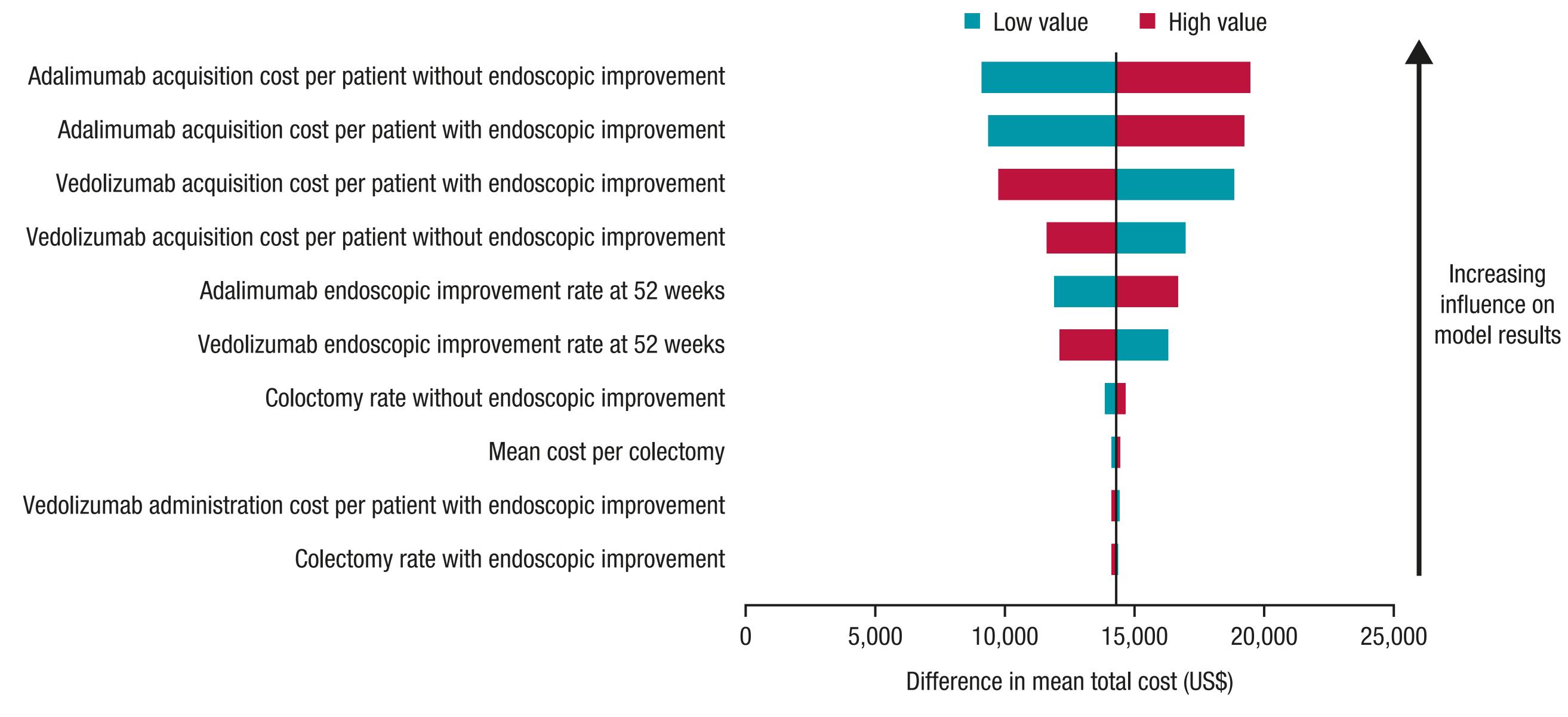
Figure 2. Mean estimated total costs per patient treated with vedolizumab or adalimumab over 1 year were \$14,322 lower for vedolizumab than for adalimumab in this model



Table 2. In the base case model, treatment with vedolizumab was estimated to be less expensive than treatment with adalimumab in 73.3% of patients

Treatment model	Proportion with endoscopic improvement, %	Colectomy rate, %	Probability of savings when treated with either drug, %
Base case (10,000 patients)			
Vedolizumab	39.8	9.8	73.3
Adalimumab	27.5	11.5	26.7
Scenario 1 (1,108 patients)			
Vedolizumab	100	3.6	100.0
Adalimumab	100	3.6	0.0
Scenario 2 (2,874 patients)			
Vedolizumab	100	3.4	15.1
Adalimumab	0	15.8	84.9
Scenario 3 (1,638 patients)			
Vedolizumab	0	14.3	86.0
Adalimumab	100	3.2	14.0
Scenario 4 (4,380 patients)			
Vedolizumab	0	13.8	100.0
Adalimumab	0	13.8	0.0

Figure 3. Drug price and endoscopic improvement rates were the most influential parameters on model results



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