EE686

Cost effectiveness of Ruxolitinib for treatment of Steroid Refractory acute Graft versus Host Disease in patients ≥12 years of age from a Singapore Healthcare System Perspective

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Introduction

Acute graft-versus-host disease (aGvHD) is a complication of allogeneic hematopoietic stem cell transplantation (allo-HSCT) which contributes to post transplant morbidity and mortality[1]. In the REACH2 open label randomized controlled trial, treatment of steroid refractory (SR)-aGvHD with ruxolitinib led to significantly higher overall response rates at 28 days than best alternative therapy (BAT)[2].

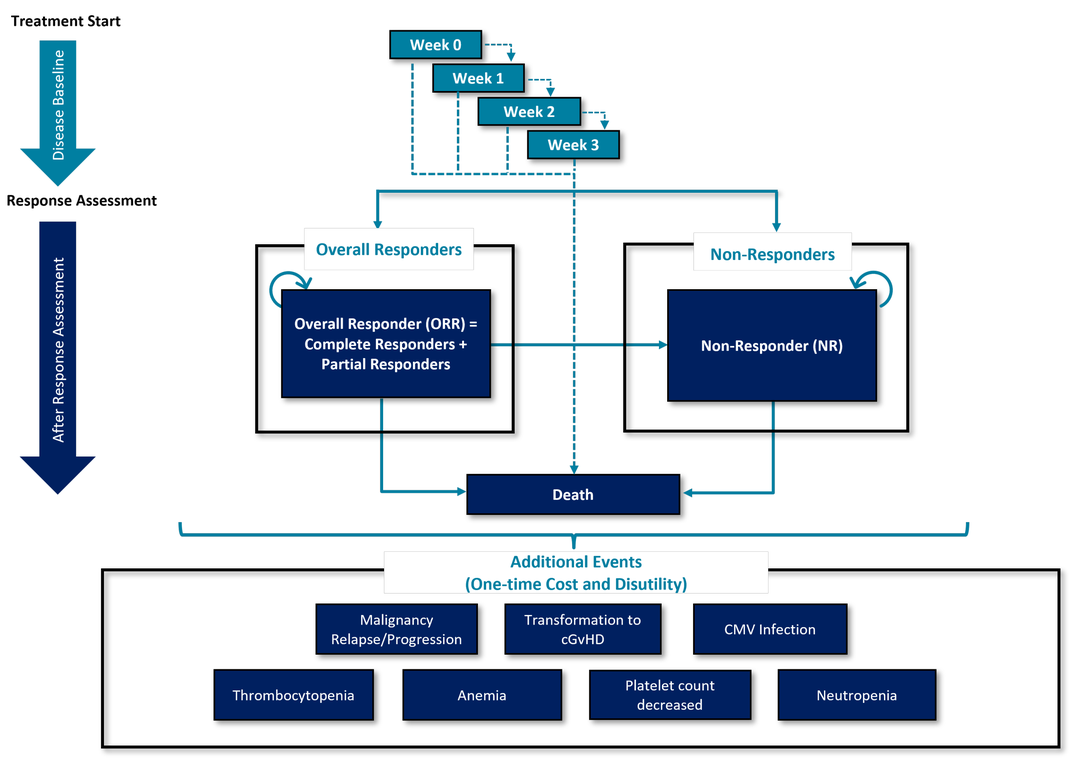
Objectives

To determine the cost-effectiveness of ruxolitinib compared with BAT for treatment of patients ≥12 years of age who develop SR-aGvHD following allo-HSCT from a Singaporean healthcare system perspective.

Methods

A semi-Markov model was developed in Microsoft Excel®

- *Time horizon*: 15 Years
- *Discount Rate:* 3%
- *Cycle Length:* 28 Days (with half cycle correction)



PICO:

Population:

- Patients (≥12 years) who develop SR-aGvHD following allo-HSCT

Intervention:

- Ruxolitinib 10 mg twice daily

Comparator:

- BAT composition informed by local clinicians
- 5% Methotrexate/95% Extracorporeal Photopheresis

Outcomes:

- Life Years (LYs)
- Quality Adjusted Life Years (QALYS)
- Costs
- Incremental Cost Effectiveness Ratio (ICER)

Model Inputs:

Clinical Effectiveness:

- Overall survival and duration of response extrapolated from individual patient data (IPD) from REACH2[2]
- Median time to and proportion of patients experiencing additional events based off REACH2[2]

Costs:

- Healthcare resource utilization from REACH2 Trial[2]
- Duration of treatment extrapolated from IPD from REACH2[2]
- Unit costs from local hospital database and local healthcare payer[3-4]

Utilities:

- EuroQol 5D-3L collected from REACH2[2]
- Disutilites for each additional event obtained from literature[5-9]

Sensitivity Analysis

- For *one way sensitivity analysis,* without changing other parameters, a 20% variation was applied to costs, utilities, additional event rates, healthcare utilization, and parameters used for survival extrapolation.
- *Scenario analysis* explored impact of varying time horizons/discount rates, a societal perspective, alternative BAT compositions and alternative approaches to survival extrapolation.
- 3000 probabilistic iterations is done in *probabilistic sensitivity analysis.*

Results

Ruxolitinib dominated BAT, leading to an incremental 0.18 LYs, 0.15 QALYs and cost savings of SGD 31,079 compared to BAT.

	Ruxolitinib	Best Alternative Therapy	Incremental
LYs	1.87	1.69	0.18
QALYs	1.04	0.89	0.15
Total Costs (SGD)	SGD 65,336	SGD 96,415	SGD −31,079
Drug Acquisition and Administration (ORR)	SGD 10,775	SGD 19,630	-SGD 8,855
Drug Acquisition and Administration (NR)	SGD 11,945	SGD 24,256	-SGD 12,312
Concomitant Medication Costs	SGD 1,047	SGD 965	SGD 82
Healthcare Resource Use	SGD 35,910	SGD 46,496	-SGD 10,586
Adverse Event Management	SGD 2,648	SGD 2,041	SGD 607
Terminal Care	SGD 3,011	SGD 3,027	-SGD 15
ICER (cost/LY)		**Dominant**	
ICER (cost/QALY)		**Dominant**	

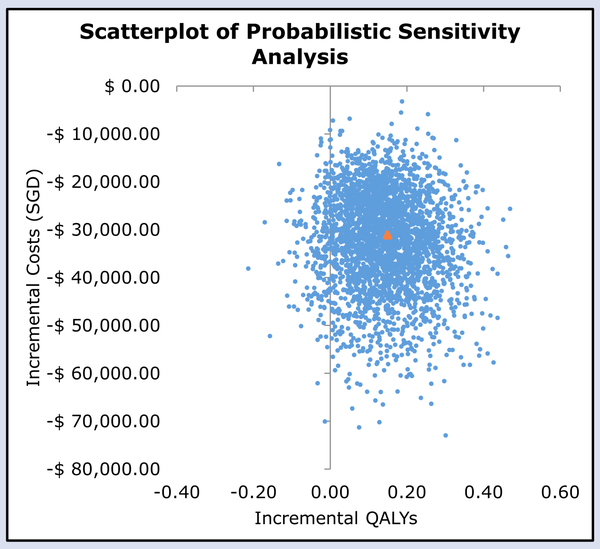
One Way Sensitivity Analysis (OWSA):

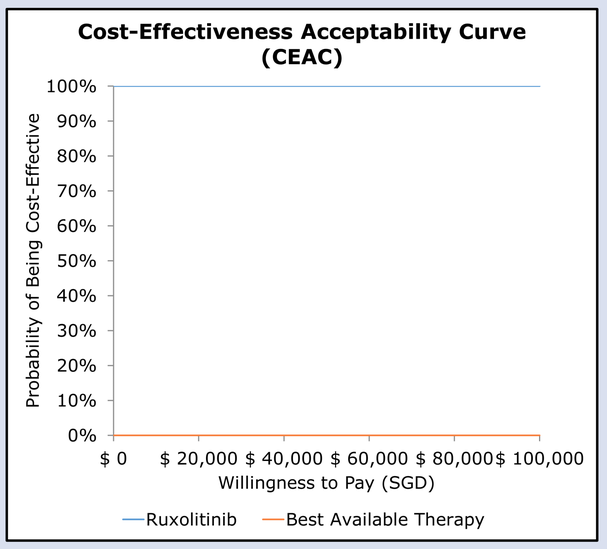
- In OWSA, ICER was most sensitive to the following parameters:
  - Weibull shape parameters used to extrapolate overall survival in non-responders decreased by 20%
  - Weibull shape parameters used to extrapolate overall survival Overall responders were increased by 20%
- Ruxolitinib dominated BAT at all other variations explored, including cost, utilities and healthcare utilization data.

Scenario Analysis: Ruxolitinib dominated BAT in all scenarios explored

Scenario	Incremental Costs	Incremental QALYs	ICERs
Base Case	0.15	-SGD 31,079	Dominant
Discount Rate (0%)	0.16	-SGD 32,198	Dominant
Discount Rate (5%)	0.14	-SGD 30,432	Dominant
Time Horizon 10 Years	0.15	-SGD 30,721	Dominant
Time Horizon 20 Years	0.15	-SGD 31,216	Dominant
Societal Perspective	0.15	-SGD 43,005	Dominant

Probabilistic Sensitivity Analysis: At a willingness to pay of 75,000 SGD/QALY Ruxolitinib was cost effective in 100% of probabilistic iterations





Limitations

- Uncertainty around exact composition of comparators
- Uncertainty around long term treatment outcomes

Conclusion

From a Singaporean healthcare payer perspective, ruxolitinib is likely to represent a good use of healthcare resources for treatment of steroid refractory acute graft versus host disease when compared against best alternative therapy.

References

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