Cost Effectiveness of Firsekibart for the Treatment of Acute Gout Patients Unsuitable for Standard Therapy in China

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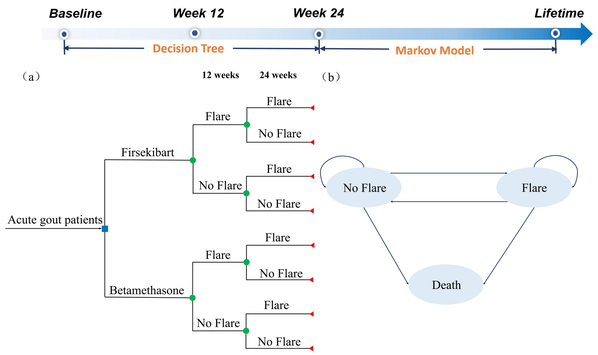
Introduction

Firsekibart, a first-in-class novel drug, demonstrated superior efficacy in reducing gout flare risk in its phase 3 trial. However, the economic value of this treatment remains uncertain. Our study aims to evaluate the cost-effectiveness of Firsekibart versus conventional compound betamethasone for the treatment of acute gout patients unsuitable for standard therapy from the Chinese healthcare system perspective.

Methods

● The Model

A cohort state-transition model was developed using a short-term decision tree (24 weeks) followed by a long-term Markov model (alive and dead) with three health states to simulate the lifetime disease progression and costs for gout patients.



● Parameters

Key clinical data were generated from the randomized phase 3 trial evaluating the efficacy and safety of Firsekibart compared with compound betamethasone. Healthcare costs were determined from the Chinese pharmaceutical database, published literature and clinicians' opinions. Health state utilities were obtained from a nationwide survey covering 1,000 gout patients in China , and were supplemented by values from published literature. Both costs and health outcomes were discounted at 4.5% annually.

Key clinical data	Firsekibart phase 3 trial	
Healthcare cost	Expert opinions	Published literature
Health Utility	A survey study	Published literature

Results

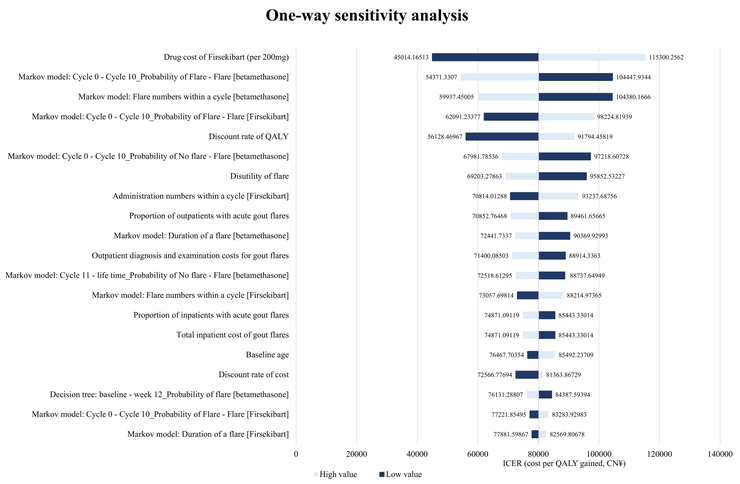
● Base-case analysis

In the base-case analysis, lifetime costs per patient were CN¥56,477 (US$8,059) for Firsekibart, and CN¥49,664 (US$7,087) for betamethasone. Total QALYs were 11.78 and 11.69, respectively. The lifetime incremental cost per patient for Firsekibart was CN¥6,813 (US$972), with an incremental QALY of 0.09, yielding an ICER of CN¥80,157 (US$11,438) per QALY, which was below the threshold of one time per-capita GDP of CN¥95,749/QALY (US$13,663/QALY) in China.

Indicators	Firsekibart	Betamethasone	Difference
Total costs (yuan)	56477.6	49664.0	6813.6
Anti-inflammatory drug costs	14936.3	537.2	14399.2
Drug administration costs	11.8	69.6	-57.9
Disease management costs	33598.9	33598.9	0.0
Non-drug costs associated with gout flares	1505.0	8299.0	-6794.0
Complications	5601.2	6086.8	-485.5
Adverse events	824.4	1072.5	-248.1
Total QALYs	11.78	11.69	0.09
ICER (yuan per QALY)		80,157.2	

● One-way sensitivity analysis

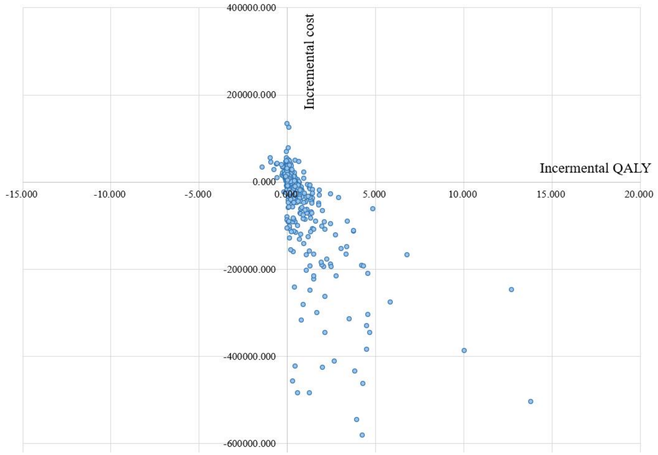
The three parameters that have the greatest impact on the ICER were as follows: drug cost of Firsekibart, probability of flare, and flare numbers within a cycle. The ICER ranges from 45014.2 to 115300.3.



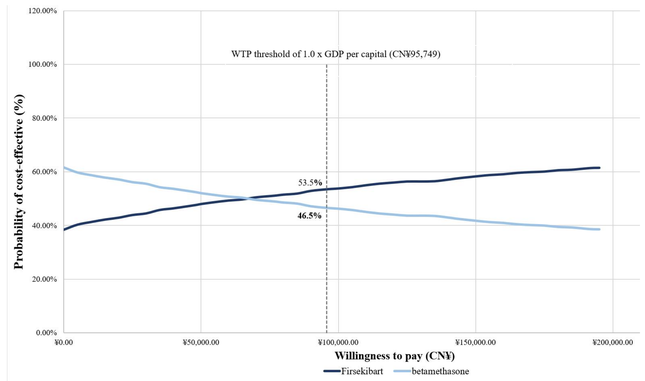
Results (cont.)

● Probabilistic sensitivity analysis

Most results of the probabilistic sensitivity analysis fell below the WTP threshold line of one time per capita GDP, indicating that Firsekibart was cost-effective and the results of the base- case analysis were robust.



At the WTP threshold of one time per capita GDP, the probability that Firsekibart was cost-effective compared with compound betamethasone was 53.5%.



Conclusions

Firsekibart compares favorably with betamethasone in the Chinese setting, which is mainly due to its higher efficacy resulting in lower risk of new flare over time. The results could inform deliberations regarding reimbursement and access to this treatment in China. Further research should focus on reducing uncertainty regarding disease progression rates and flare-related costs.