Cost-Effectiveness Analysis of Third-Line Pazopanib Versus Regorafenib for Metastatic or Unresectable Gastrointestinal Stromal Tumors in China

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BACKGROUND

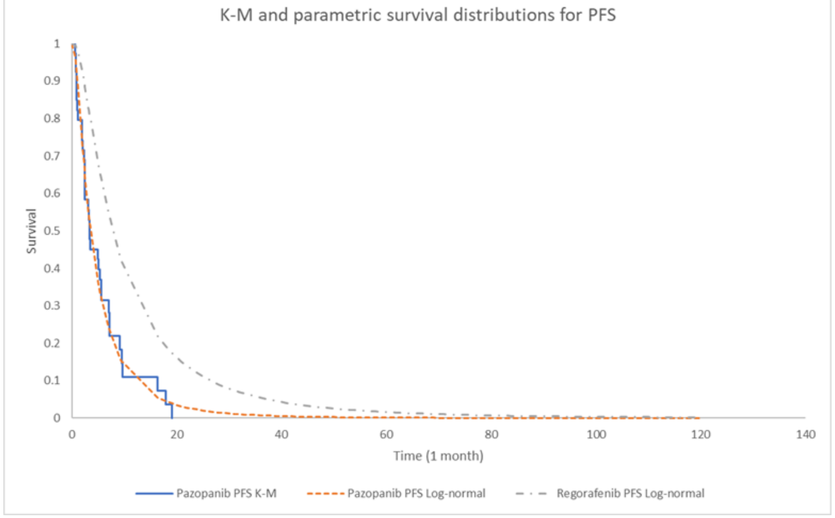
- Gastrointestinal stromal tumors (GISTs) are rare sarcomas of the soft tissue that originated from the mesenchymal tissue of the gastrointestinal (GI) tract
- Despite the high five-year survival rate, GISTs still cause very large productivity losses and economic burdens
- Pazopanib has been recommended as a third-line treatment drug for GISTs patients according to the 2020 guidelines of the Chinese Society of Clinical Oncology for GISTs and GEIS guidelines for gastrointestinal sarcomas

OBJECTIVES

- While pazopanib was recommended in the guideline, it was off-label in China, and no studies have focused on the cost-effectiveness of pazopanib for GISTs. This study aimed to evaluate the cost-effectiveness of pazopanib versus regorafenib as the third-line treatment in patients with metastatic or unresectable GISTs in China

METHODS

- **Perspective:** health care system
- **Model:** A three-state partitioned model was constructed. (progression-free (PF) survival state, disease progression (PP) state and the death state).
- **Time horizon:** 10 years (lifetime)
- **Patient Population:** Patients who had metastatic or unresectable GISTs, with the previous failure of at least two drugs, including both imatinib and sunitinib
- **Intervention and comparator**: Pazopanib and regorafenib
- **Effectiveness:** From the PAZOGIST trial (pazopanib) and GRID trial (regorafenib)
  - Proportions were estimated based on the Kaplan-Meier (K-M) PFS and OS curves that were available from the trial for each treatment, and the data were extracted with Engauge Digitizer software. The pseudo-individual patient data (IPD) was reconstructed through R 3.6.0
  - Five parameter distributions to fit two curves: Exponential, Weibull, Gompertz, Log-logistic and Log-normal. Log-normal function and Exponential function were respectively selected for the extrapolation of the PFS and OS data of the pazopanib group, as they generated the lowest Akaike information criterion (AIC) and Bayesian information criterion (BIC) values for the parametric models tested
  - The HRs of PFS and OS from the GRID trial were used to do the indirect comparison since they almost met the proportional hazard assumption
- **Cost inputs:** Drug costs were derived from government-published data and drug exposure in each clinical trial was applied to calculate the actual drug costs. Costs for medical services and costs in the PD state were obtained from published literature.
- **Utility:** From the patient-reported outcomes in the GRID trial where the EuroQol-5D (EQ-5D) for PF and progressive disease health status.
- **Sensitivity analyses:** One-way sensitivity analysis and probabilistic sensitivity analysis (PSA) were performed to explore the uncertainty in this model



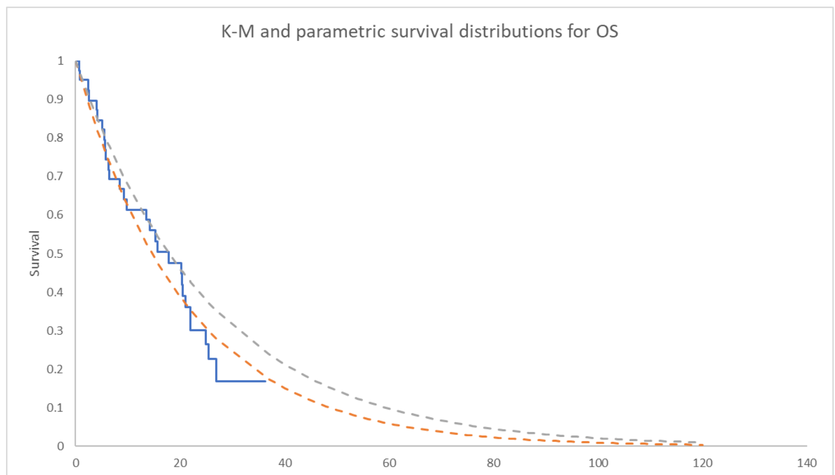


Table1 Key inputs in the model

HR PFS of pazopanib	0.59
HR PFS of regorafenib	0.27
HR OS of pazopanib	0.94
HR OS of regorafenib	0.77
QoL utility (per year)	
PF pazopanib	0.780
PF regorafenib	0.779
PP	0.647
Cost per cycle	Value (¥)
Drug costs	
Pazopanib	$2,369
Regorafenib	$2,253

RESULTS

◆Base case results:

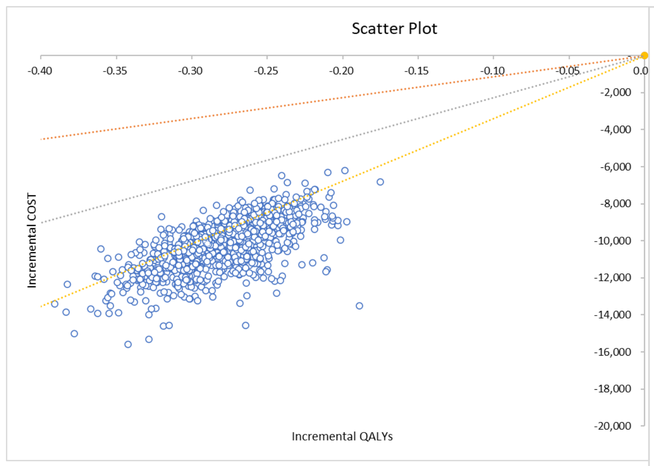
- Pazopanib treatment demonstrated an average of 1.13 QALYs while regorafenib treatment demonstrated 1.41 QALYs. Pazopanib treatment also cost less, with an average cost of $35,791 compared to $45,971 for regorafenib treatment. These results imply an incremental cost-effectiveness ratio (ICER) of $36,480 per QALY gained, which exactly over three times GDP per capita in China, considering pazopanib was cost-effective.

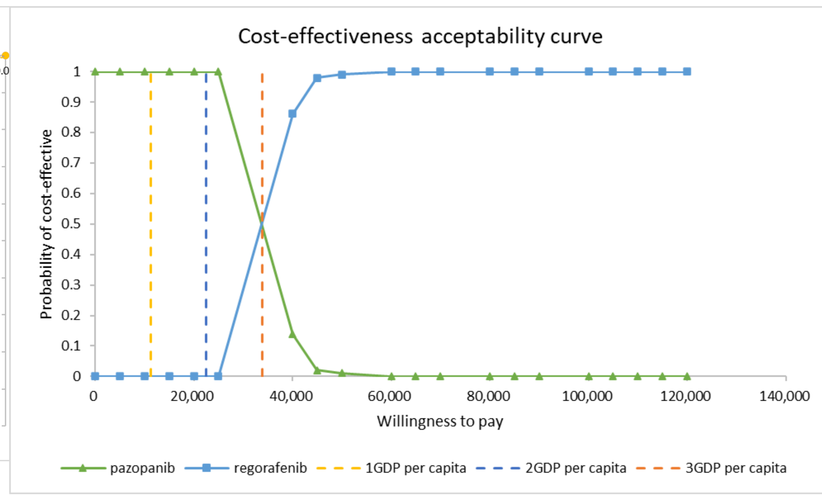
◆One-way sensitivity analysis:

- According to the results of the one-way sensitivity analysis, we found that the cost of regorafenib, the cost of pazopanib and the cost of BSC per cycle were the main model drivers in the model. The range of the one-way sensitivity analysis was from $17,384/QALYs ~$45,944/QALYs.

◆Probabilistic sensitivity analysis :

- A PSA was performed to explore the parameter uncertainty in the model. After 1,000 Monte Carlo simulations, the average difference between pazopanib and regorafenib was -0.28 QALYs and -$10,249. At a threshold of $11,267/QALYs~$33,801/QALYs (1-3 times the GDP per capita in 2020), pazopanib had a 77%~100% probability of being cost-effective





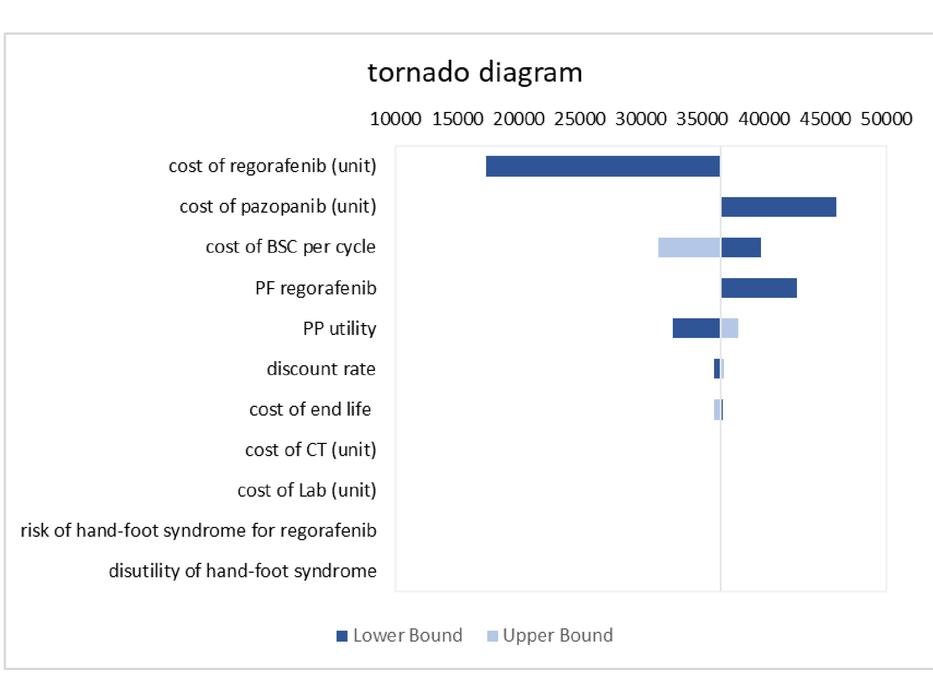


Table 2 Results of the base case analysis

Outcome	Pazopanib	Regorafenib	Incremental
LYs	1.66	1.98	-0.33
QALYs	1.13	1.41	-0.28
Cost, $	35,791	45,971	-10,180
Incremental cost per LY, $	/	/	31,229
Incremental cost per QALY, $	/	/	36,480

CONCLUSION

This analysis suggests that pazopanib provides a subtractive PFS benefit but is cost-effective compared to regorafenib for these patients in China based on the currently available clinical data.

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