cost-effectiveness of pretomanid-based regimen for treatment of highly drug-resistant tuberculosis in a high-income setting

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Background

- Tuberculosis (TB) is the leading infectious disease globally (1.6 million in 2021).
- Highly drug-resistant tuberculosis (HDTB) comprises pre-extensively or extensively drug-resistant tuberculosis (XDR-TB), and treatment-resistant or nonresponsive multidrug-resistant tuberculosis (MDR-TB).
- Treatment for HDTB with bedaquiline-based regimen is costly, takes a long time to complete, and has life-threatening adverse effects.
- Lower treatment success rate (90% for MDR-TB and 52% for XDR-TB).
- Treatment cost per case in the US (USD 420,000 for MDR-TB and USD 801,000 for XDR-TB).
- Recent clinical findings reported improvement in clinical outcomes of HDTB with the pretomanid-based regimen (with shortened treatment duration).

Objective

This study aimed to evaluate the cost-effectiveness of the pretomanid-based regimen for HDTB treatment from the perspective of healthcare provider in the US.

Methods

Decision model

- A 2-year decision-analysis model (Fig 1) was constructed to simulate potential treatment outcomes of (1) bedaquiline-pretomanid (BPaL) regimen, and (2) bedaquiline-利福喷丁 (B-L) based regimen in a hypothetical cohort of adult patients with HDTB.

Results

- The BPaL regimen averted 2.551 DALYs and saved cost by USD33,352 when compared to the B-L-based regimen.

Discussion and Conclusion

- The base-case analysis findings showed the BPaL regimen to save cost and avert DALYs in HDTB.
- The study findings were consistent with cost-effectiveness analysis of the BPaL regimen (against the current standard of care) for the treatment of XDR-TB in high-burden epidemiological settings (South Africa, Georgia, and Philippines).
- The averted DALY with the BPaL regimen translated from higher clinical improvement (1.35-fold) of HDTB treatment with BPaL.

References

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