

Cost-Effectiveness analysis of the TCM “YuPingFeng granules” in the treatment of acute exacerbations of COPD based on a Randomized Clinical Trial

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Background

Traditional Chinese medicine (TCM) has gained popularity globally and may provide further options for many diseases. The TCM “YuPingFeng” has been used in China for over 800 years, and its clinical efficacy and safety for COPD treatment has been proved in previous studies. The objective of this study was to assess the long-term cost-effectiveness of YuPingFeng granules and the current conventional treatment drugs for patients with COPD in China.

Method

A Markov model was constructed from the perspective of the Chinese healthcare system using Treeage Pro 2011(Figure 1). The model cycle length was 12 months, and the cycle time was set to 10 years. A randomized controlled trial was used to generate the number of acute exacerbations, COPD assessment test (CAT) score and actual medication. The state transition probabilities, costs and quality-adjusted life-years(QALYs) were derived from publicly available sources. The incremental cost-effectiveness ratio was compared with the willingness to pay threshold of 72,447 yuan(China's GDP per capita in 2020). One-way and probabilistic sensitivity analyses were conducted to verify the robustness of the model. In addition, the cost-effectiveness of cycling 35 years was evaluated as scenario analysis.

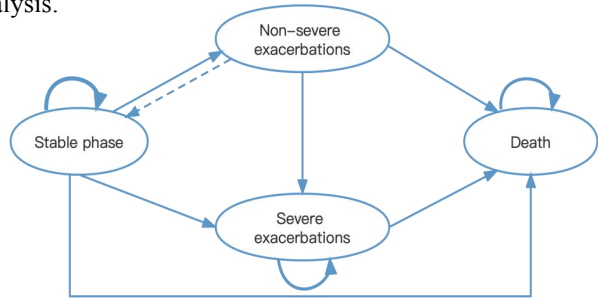


Figure 1 Markov bubble chart of Yupingfeng granules in the treatment of chronic obstructive pulmonary disease

Result

In the basic-case analysis, the incremental cost-effectiveness ratio of introducing YuPingFeng granule into the current conventional treatment drugs was ¥2,123.04 per QALYs, which was less than the willingness to pay threshold(one-time per capita GDP). Sensitivity analyses showed the results to be robust. Probabilistic sensitivity analysis showed that the probability that ICER was less than the one-time per capita GDP threshold was 100%(Figure 2 & 3) In the scenario analysis, the incremental cost-effectiveness was ¥12,051.27 per QALYs which was also under one-time per capita GDP. (Table 1)

Table 1 Cost-effectiveness of Yupingfeng group compared with placebo group

| Treatment group | Cost,¥ | QALYs | Incremental cost ,¥ | Incremental QALYs | ICER ¥/QALYs |
|---------------------------|------------|-------|---------------------|-------------------|--------------|
| Base-case analysis | | | | | |
| Control group | 103,355.81 | 5.34 | | | |
| Yupingfeng group | 104,346.93 | 5.81 | 991.12 | 0.47 | 2,123.04 |
| Scenario analysis | | | | | |
| Control group | 126,121.16 | 6.22 | | | |
| Yupingfeng group | 135,409.54 | 6.99 | 9288.38 | 0.77 | 12,051.27 |

ICER Incremental cost-effectiveness ratio , QALYs quality-adjusted life-years

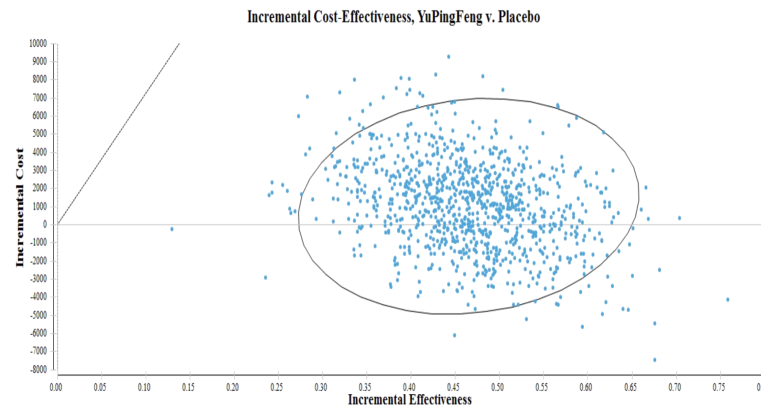


Figure 2 Cost-effectiveness acceptable curve plotting

CE Acceptability Curve

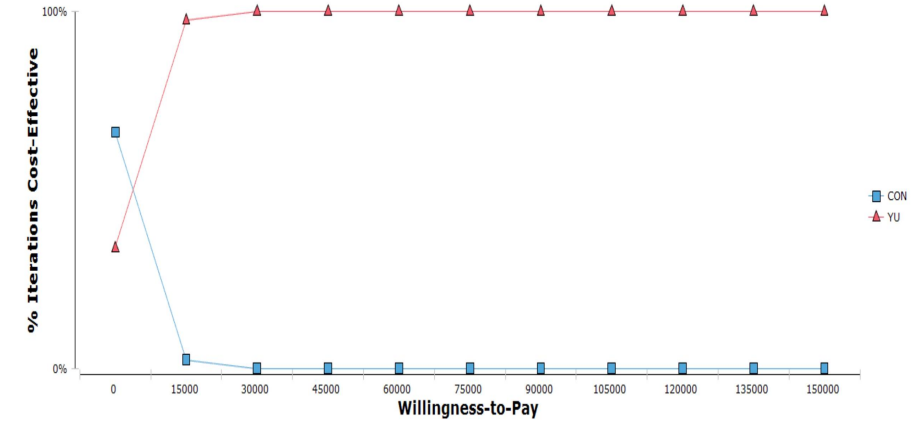


Figure 3 Monte Carlo simulation pseudo-scatter plot

Conclusions

By reducing the number of acute exacerbations of COPD, thereby correspondingly reducing the follow-up treatment cost, YuPingFeng granules combined with the conventional treatment provided a cost-effectiveness therapeutic strategy for COPD.

References

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