Cost-effectiveness analysis of different treatment strategies for schizophrenia in China

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Introductions

- schizophrenia is a common mental disease whose etiology has not been fully elucidated. It is common in all populations around the world, and has a high economic burden in China.

Objectives

- To estimate the cost-effectiveness of different treatment strategies for schizophrenia and to provide evidence for clinical decision-making in China

Methods

- A Markov model with three health states (stable, relapse, and dead) was developed to simulate the progression of a cohort of patients with schizophrenia, considering patient compliance. The Markov state transition and decision tree model for patients with schizophrenia were shown in Fig.1 and Fig.2.
- From the healthcare system perspective, the medication costs and inpatient costs were collected.
- The cumulative costs (in Chinese Yuan, CNY) and health outcomes (in Quality-Adjusted Life Year, QALY) over 5 years were estimated for the treatment strategies with daily oral administration, as well as one injection every half, one, three, and six months.
- The incremental cost-effectiveness ratios (ICERs) were calculated for the comparisons of different strategies for treating schizophrenia.
- The robustness of results was assessed through sensitivity analyses.

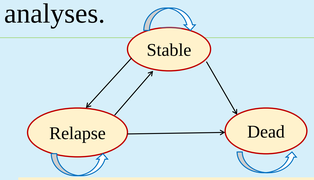

Figure 1 The Markov state transition model for patients with schizophrenia

Results

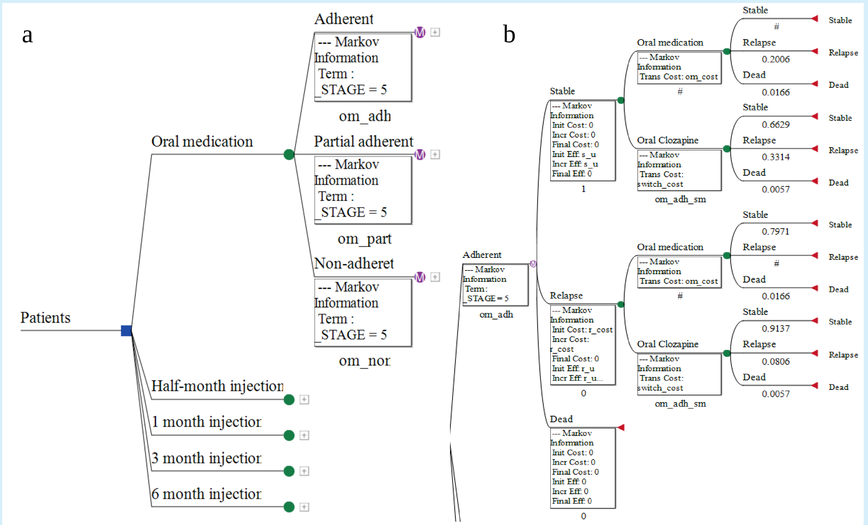

Figure 2 Markov decision tree models of different treatment strategies for schizophrenia

- The results of the cost-effectiveness analysis are shown in Table 1 and Fig.3. The 5-year treatment costs predicted by model of daily oral administration and one injection every half, one, three and six months were 139,043.2 CNY, 210,526.6 CNY, 179,465.6 CNY, 158,927.8 CNY, and 525,050.7 CNY. The quality-adjusted survivals of five treatment strategies above were 4.10 QALYs, 4.19 QALYs, 4.34 QALYs, 4.33 QALYs, and 4.26 QALYs, respectively.
- Daily oral administration was least costly, while every-1-month injection was most effective. The strategies of giving one injection every half month and every six months were more costly and less effective than every-1-month injection strategy.
- The costs per QALY gained were 85,614.6 CNY for every-3-month injection strategy and 4,078,215.6 CNY for every-1-month injection strategy, compared with the daily oral medication.
- The results of sensitivity analysis are shown in Fig. 4. Sensitivity analysis suggested the good reliability of model predictions.

Table 1 Incremental cost-effectiveness ratio of different treatment strategies for schizophrenia

Strategy	Cumulative cost(CNY)	Cumulative effect(QALY)	Incremental effect(QALY)	ICER
Daily oral administration	139,043.2	4.10	-	-
One injection every half month	210,526.6	4.19	0.151	206,165.6
every-1-month injection	179,456.6	4.34	0.005	4078,215.6
every-3-month injection	158,927.8	4.33	0.232	85,614.6
every-6-month injection	525,050.7	4.26	0.079	4351,541.4

ICER= incremental cost-effectiveness ratio, QALY= quality-adjusted life year, CNY= in Chinese Yuan

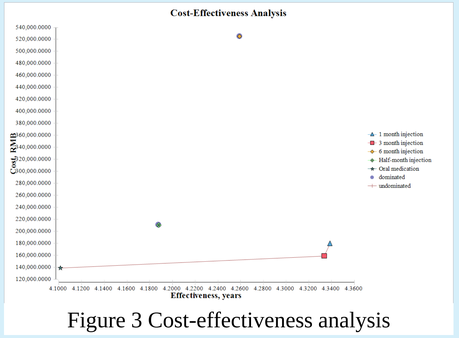

Figure 3 Cost-effectiveness analysis

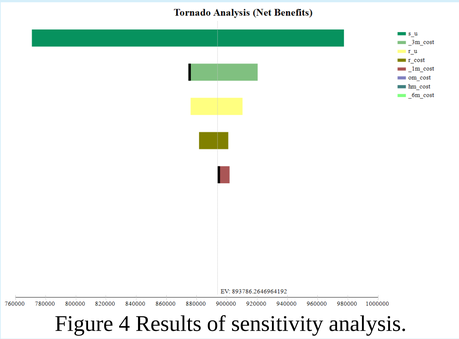

Figure 4 Results of sensitivity analysis.

Conclusions

- With the threshold of three times per capita Gross Domestic Product in 2021 in China (242,928 CNY), the treatment strategy of giving one injection every three months is cost-effective, which might provide evidence for clinical decision-making for schizophrenia treatment in China.