Comparative Effectiveness of Pharmacological Treatments for Stable Chronic Obstructive Pulmonary Disease in the Chinese Population: A Bayesian Network Meta Analysis

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Background & Aim

Chronic obstructive pulmonary disease (COPD) is a major cause of mortality worldwide, with a high burden in China. Although inhaled therapies are the cornerstone of stable COPD management, current evidence is largely derived from non-Chinese populations. This study conducted a Bayesian network meta-analysis of randomized controlled trials in Chinese patients to compare the relative efficacy of inhaled therapies and provide population-specific evidence for clinical decision-making.

Methods

Study Design & Registration

Bayesian network meta-analysis (NMA) conducted وفقPRISMA-NMA.

Registered in PROSPERO (CRD420261348717).

Data Sources & Search Strategy

Databases: Embase, Cochrane Library, PubMed, Web of Science, CNKI, Wanfang Data, ClinicalTrials.gov.

Timeframe: January 2010 – December 2025.

Study type: Randomized controlled trials (RCTs).

Population & Interventions

Population: Chinese patients with stable COPD.

Interventions: LAMA, LABA, ICS, LAMA+LABA, LABA+ICS, triple therapy (LAMA+LABA+ICS), oral traditional Chinese medicine (TCM) as add-on therapy.

Outcomes

Primary: Acute exacerbation rate

Secondary: FEV_1, SGRQ, CAT, 6MWD, mMRC

Risk of Bias Assessment

Tool: Cochrane Risk of Bias 2 (RoB2)

Results

Eligible studies

A total of 5,161 records were identified through the literature search. After removing 1,347 duplicates and excluding 3,382 studies based on titles and abstracts for not meeting the inclusion criteria, 432 studies underwent full-text assessment. Ultimately, 63 eligible randomized controlled trials (RCTs) were included in the network meta-analysis.

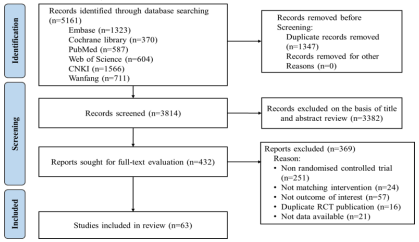

Fig 1. Network meta-analysis flowchart

Network analysis

The primary outcome network was well connected, with inhaled therapies forming the core and placebo as a common comparator; TCM add-on therapy was mainly linked via placebo, indicating reliance on indirect evidence.

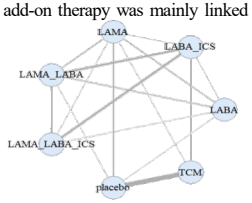

Fig 2. Network of available comparisons between inhaled treatment regimens of primary outcome

Best treatment probabilities

The evidence networks for secondary outcomes were also generally well connected, with similar structures dominated by inhaled therapies and placebo as a common comparator, although some comparisons were supported by more limited evidence.

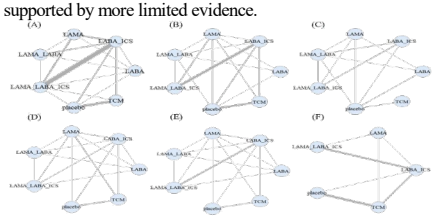

Fig 3. Network of secondary outcomes, (A): 12w-FEV_1, (B): 24w-FEV_1, (C): SGRQ, (D): CAT, (E): mMRC, (F): 6MWD

Best treatment probabilities

Across outcomes, LAMA+LABA+ICS and TCM add-on therapy consistently ranked among the most effective treatments. TCM add-on achieved the highest ranking for exacerbation reduction and showed favorable performance in exercise capacity, while triple therapy demonstrated superior efficacy in lung function and symptom improvement. Dual therapies showed moderate efficacy, whereas monotherapy and some LABA-based regimens generally ranked lower.

Table 2. SUCRA values of different inhaled treatment regimens

Outcomes	LABA	LAMA	LABA+ICS	LAMA+LABA	LAMA+LABA+ICS	TCM
Exacerbation rate	0.305	0.589	0.346	0.388	0.648	**0.920**
12w-FEV_1	0.446	0.427	0.231	0.599	**0.873**	0.811
24w-FEV_1	0.364	0.297	0.589	0.717	**0.973**	0.482
24w-CAT	0.461	0.305	0.513	0.565	**0.808**	0.760
24w-SGRQ	0.516	0.224	**0.730**	0.704	0.573	0.591
24w-mMRC	0.498	0.565	0.476	0.297	**0.836**	0.634
24w-6MWD	NA	0.318	0.340	NA	0.834	**0.889**

Conclusion

Among the pharmacological treatments evaluated, LAMA/LABA/ICS was consistently associated with favorable outcomes across multiple clinical endpoints in patients with stable COPD in the Chinese population. TCM as add-on therapy also demonstrated beneficial effects in several outcomes. These findings highlight meaningful differences in treatment performance and may inform treatment selection in clinical practice..

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