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Association of Inhaled Corticosteroids With All-Cause Mortality Risk in Patients With COPD

A Meta-analysis of 60 Randomized Controlled Trials

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Background

Inhaled corticosteroids (ICSs) have been used widely in the maintenance therapy of COPD. However, whether inhaled therapy containing ICSs can reduce the all-cause mortality risk and the possible benefited patient subgroups is unclear.

Research Question

Does inhaled therapy containing ICSs reduce the all-cause mortality risk in patients with COPD compared with other inhaled therapies not containing ICSs?

Design and Methods

We searched PubMed, Cochrane Library, Embase, and ClinicalTrials.gov for relevant randomized clinical trials (RCTs). Pooled results were calculated using Peto ORs with corresponding 95% CIs.

Results

Sixty RCTs enrolling 103,034 patients were analyzed. Inhaled therapy containing ICSs (Peto OR, 0.90; 95% CI, 0.84-0.97), especially triple therapy (Peto OR, 0.73; 95% CI, 0.59-0.91), was duration of > 6 months (Peto OR, 0.90; 95% CI, 0.83-0.97), medium-dose ICSs (Peto OR, 0.71; 95% CI, 0.56-0.91), low-dose ICSs (Peto OR, 0.88; 95% CI, 0.79-0.97), and budesonide (Peto OR, 0.75; 95% CI, 0.59-0.94) were involved in this association. The predictors of this association included eosinophil counts of ≥ 200/μL or percentage of ≥ 2%, documented history of ≥ 2 moderate and severe exacerbations in the previous year, Global Initiative for Chronic Obstructive Lung Disease stages III or IV, age younger than 65 years, and BMI of ≥ 25 kg/m^2, among which eosinophil counts of ≥ 200/μL (Peto OR, 0.58; 95% CI, 0.36-0.95) were the strongest predictor.

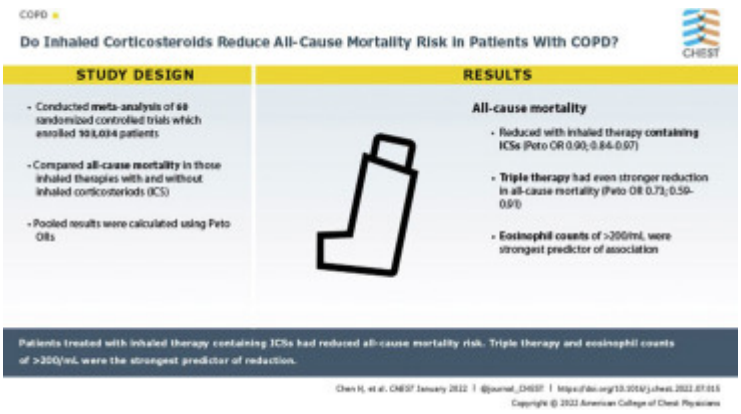
Interpretation

Inhaled therapy containing ICSs, especially triple therapy, of longer than 6 months was associated with a reduction in the all-cause mortality risk in patients with COPD. The predictors of this association included medication factors and patient characteristics, among which eosinophil counts of ≥ 200/μL were the strongest predictor.

Trial Registry

PROSPERO; No.: CRD42022304725; URL: https://www.crd.york.ac.uk/prospero/

Graphical Abstract



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Key Words

all-cause mortality • COPD • inhaled corticosteroids • meta-analysis • triple therapy

Abbreviations:

GOLD (Global Initiative for Chronic Obstructive Lung Disease), ICS (inhaled corticosteroid), LABA (long-acting β2-agonist), LAMA (long-acting muscarinic receptor antagonist), RCT (randomized clinical trial)

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