

### **Clinical Bottom Line**

While limited by the fact that the studies did not examine patients with COPD versus those without, the available data suggest that administration of corticosteroids in addition to standard therapy improved outcomes in all patients with severe pneumonia without any significant adverse effects.

### **PICO Question**

Does addition of corticosteroids to standard therapy for pneumonia improve outcomes (mortality, hospital days, days on ventilator) compared to standard therapy alone, particularly in patients with severe pneumonia?

### **Study #1**

Wu et al. "Efficacy of corticosteroid treatment for severe community-acquired pneumonia: a meta-analysis." *American Journal of Emergency Medicine*, 36 (2018) 179-184.

<https://www.ncbi.nlm.nih.gov/pubmed/28756034>

### **The basics**

This is a systematic review and meta-analysis of published randomized controlled trials to evaluate the efficacy of corticosteroid therapy in patients with severe CAP. The analysis included ten RCTs that satisfied the inclusion criteria and had compared "conventional pneumonia treatment" control groups vs a treatment group of conventional therapy plus corticosteroids.

### **Exclusion criteria**

- duplicated publications
- expert commentaries or review articles, conference reports, systematic reviews, previous meta-analysis, and case reports
- published theoretical or pharmaceutical reports
- controlled studies of therapeutic interventions in CAP that did not include corticosteroids
- inaccurate data that have obvious mistakes
- the main outcomes from the included studies were less than two of the analyzed indexes

### **Primary Outcomes**

- In-hospital mortality

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Drs Harris and Pierce  
Faculty Advisor: Dr. C Eastin

- Clinical efficacy
- Length of hospital stay
- Mechanical ventilation time

## Results

The study found a statistically significant improvement in in-hospital mortality (12.04% vs 5.8%) and length of stay (WMD: -4.21; 95% CI -6.61 to -1.81), but no benefit for mechanical ventilation time or clinical efficacy.

## Strengths

- Clinically relevant primary outcomes

## Limitations/Biases

- Little information available about included studies
- No inclusion of secondary outcomes or adverse effects
- Different medications, dosing and length of treatment of steroids in included studies
- Included several low-quality RCTs (based of Jadad score)
- “Clinical efficacy” was never really defined, though it was a measured primary outcome
- No description of control therapies used
- No unpublished studies included in search

## Study #2

Stern, et al. “Corticosteroids for Pneumonia: Cochrane Review.” *Cochrane Database of Systematic Reviews* 2017, Issue 12. Art. No.: CD007720. DOI: 10.1002/14651858.CD007720.pub3.

<https://www.ncbi.nlm.nih.gov/pubmed/29236286>

## The Basics

This is a systematic review of randomized controlled studies looking at the benefits and safety of corticosteroids in community acquired pneumonia. Seventeen studies were included in the meta-analysis that met the inclusion criteria set up by the authors. Studies were assessed for inclusion if they studied systemic corticosteroid therapy given as an adjunct to antibiotic treatment versus placebo or no corticosteroids.

## Exclusion criteria

- People with HIV
- People with Pneumocystis pneumonia
- Studies of neonates

### **Primary Outcomes**

- All-cause mortality among people with pneumonia

### **Secondary Outcomes**

- Early clinical failure
- Time to clinical cure
- Development of respiratory failure not initially present
- Development of shock after admission
- Transfer to ICU for initial floor patients
- Duration of hospital stay
- Duration of ICU stay
- Pneumonia complications
- Secondary infections
- Adverse events

### **Results**

It was found that corticosteroids significantly reduce mortality in severe pneumonia as well as decreased early clinical failure rates, time to clinical cure, length of hospital and ICU stays, development of respiratory failure, and rates of pneumonia complications in all patients. Corticosteroids were not found to have a mortality benefit in less severe pneumonia cases, but still showed the above benefits. Adults were significantly more likely to have hyperglycemia in the corticosteroid groups, but no other major side effect was noted.

### **Strengths**

This was a well done Cochrane review that had an exhausted search for appropriate randomized control studies and considered several important clinical outcomes.

### **Limitations/Biases**

- Study did include several trials that had high likelihood of bias especially selection bias.
- Studies had a wide range of steroid dosages.
- Not all secondary outcomes were studied in most of the trials and some substitutions for these outcomes were accepted such as being afebrile would be equivalent to clinical cure.
- COPD patients were included in some studies and the analysis was not able to provide data on patients with COPD vs those without
- Many studies did not differentiate between the subgroups of severe and non-severe pneumonia.
- Antibiotic choices varied.