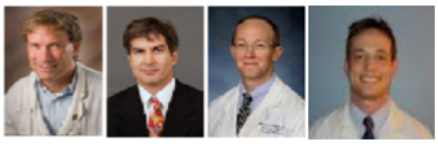
critical care perspectives in emergency medicine



Update on Steroids in Sepsis, ARDS, and CAP

Key Article

- *Chaudhuri D, Nei AM, Rochwerg B, et al. 2024 Focused Update: Guidelines on use of corticosteroids in sepsis, acute respiratory distress syndrome, and community-acquired pneumonia. Crit Care Med. 2024.*

Background

- A dysregulated inflammatory response is common in critically ill patients.
- Steroids are hypothesized to be beneficial due to their anti-inflammatory response.
- Critical illness-related corticosteroid insufficiency (CIRCI) is a state of systemic inflammation with associated dysregulation of the hypothalamus-pituitary-adrenal axis, altered cortisol metabolism, and tissue glucocorticoid resistance.
- In 2017, a taskforce provided guidelines for the diagnosis and management of CIRCI across 8 conditions.
- Since then, several studies have been published on steroids in select critical conditions.

Objective

- SCCM reconvened a panel of experts to update the previous 2017 recommendations for the use of steroids in the management of acutely ill patients with sepsis, ARDS, and CAP.

Methods

- Panel of 22 experts
- Looked at both adult and pediatric studies.
- Used the GRADE methodology and identified 5 PICO questions related to steroids in critical illness.
- Conducted systematic reviews of the literature on each of the 5 PICO questions.

Sepsis

PICO Questions

1. Should corticosteroids be administered to hospitalized patients with sepsis?
2. If patients with sepsis are administered corticosteroids, should high dose/short duration or low dose/long duration be used?

Recommendations:

- "Suggest" corticosteroids to adult patients with septic shock (conditional recommendation, low certainty)
- "Recommend against" administration of high dose/short duration steroids for adults with septic shock (strong recommendation, moderate certainty) (> 400 mg/d hydrocortisone equivalent for < 3 days)
- "No recommendation" for steroid use in pediatric patients with sepsis

Evidence Summary

- Overall, 46 RCTs on steroids compared to placebo or standard care in patients with sepsis or septic shock. Trials varied in terms of type of steroid, dosage, and duration of therapy.
- Steroids resulted in higher rates of shock reversal and reduced organ dysfunction.
- Steroids may reduce hospital/long-term mortality and probably reduce ICU/short-term mortality in patients with sepsis/septic shock.
    - Subgroup analysis based on type, duration, and dosage did not demonstrate any credible subgroup effects.
- Steroids may reduce ICU and hospital LOS.
- Steroids may increase neuromuscular weakness.
- Steroids probably increase hypernatremia and hyperglycemia.
- Steroids may reduce neuropsychiatric effects.
- Uncertain effect on GI bleeding, superinfection, stroke, and MI.

Panel

- Felt steroids offered small to moderate desirable effects particularly in septic shock.
- The reduction in organ dysfunction and shock reversal has important implications from a hospital resource perspective.
- Undesirable effects appear to be small.
- Felt that steroids were feasible and acceptable to healthcare providers.
- Decided that evidence shows benefit in patients with septic shock requiring pressors regardless of dose.
- Did not recommend a specific steroid or dosing regimen. Most common used dose is IV hydrocortisone 200-300 mg/d in divided doses or infusion for 5-7 days.
- Some studies included fludrocortisone 50 mcg enterally.

ARDS

PICO Questions

3. **Should corticosteroids compared with no corticosteroids be used in patients with ARDS?**
4. **Should methylprednisolone be used over other corticosteroids in patients with ARDS?**

Recommendations:

- "Suggest" administering corticosteroids to adult critically ill patients with ARDS (conditional recommendation, moderate certainty)
- Make no recommendation for corticosteroid use in pediatric patients with ARDS.

Evidence Summary:

- 18 RCTs compared steroids to placebo or standard care in adult hospitalized patients with ARDS. Six of those studies included patients with COVID-19.
- Steroid use probably reduces 28-day mortality.
- Subgroup analysis based on COVID-19, type, dosage, and initiation time did not demonstrate any credible subgroup effect.
- Patients who received longer courses of steroids (> 7 days) had higher rates of survival than those who received a shorter course (< 7 days).

- Steroids may lead to fewer days of mechanical ventilation and a shorter hospital LOS.

Panel:

- Decided that steroids offered moderate desirable effects, driven primarily by moderate certainty evidence that steroids reduce mortality and low certainty evidence that they reduce hospital LOS and duration of MV.
- No studies examining the cost-effectiveness of steroids in ARDS. May be short-term cost savings.
- No RCTs in children.
- Specific recommendation not made for steroid type, method of administration, or dosing strategies. Multiple dosing strategies are acceptable and best left to clinician.

CAP

PICO Question

5. **Should corticosteroids be administered to hospitalized patients with CAP?**

Recommendations:

- "Recommend" administering steroids to adult patients hospitalized with severe bacterial CAP (strong recommendation, moderate certainty).
- No recommendation for steroids for adult patients with less severe bacterial CAP.
- No recommendation for steroid use in pediatric patients with CAP.

Evidence Summary:

- 18 RCTs compared steroids to no steroids in hospitalized patients with suspected or probable bacterial CAP, including severe and less severe disease.
- In patients with severe CAP, steroids probably reduce hospital mortality. This effect is not seen in less severe CAP.
- In all hospitalized patients with CAP, steroids probably reduce need for invasive mechanical ventilation and may decrease duration of ICU and hospital LOS.
- Steroids probably increase the risk of hyperglycemia, may increase secondary infections, but have uncertain effects on GIB.

Panel:

- Panel felt there was a real and large desirable treatment effect of steroids for severe CAP.
- Panel felt that balance of beneficial and undesirable effects favors giving steroids to patients with more severe CAP but uncertain in patients with less severe CAP. Driven mostly by CAPE COD study.
- Evidence lacking on cost-effectiveness of steroids in CAP.
- Definitions for severe CAP and use of risk stratification scores are variable across RCTs. – ATS/IDSA criteria; CAPE COD criteria, scores – PSI, CURB-65
- No RCTs on steroids in children with CAP
- Multiple dosing strategies are acceptable.