

UAMS Journal Club Summary
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In patients with anaphylaxis, does the use of corticosteroids reduce the incidence of rebound (aka biphasic) anaphylaxis, reduce hospital LOS in pediatric patients?

Clinical Bottom Line: The evidence does not show that routine use of corticosteroids reduces the risk of rebound anaphylaxis however in clinical practice many providers still administer corticosteroids. In pediatric patients that are admitted to the hospital, the administration of steroids may reduce their length of stay, but like adults, steroids do not affect “rebound” anaphylaxis. There are known risks of taking steroids such as hyperglycemia, psychiatric adverse effects, avascular necrosis, and osteoporosis so steroid administration should be carefully considered in vulnerable groups. Many providers may choose to administer steroids in anaphylaxis but may choose to withhold them in a simple allergic reaction but there is little to no evidence to support this practice.

PICO Question:

P: patients with anaphylaxis

I: use of corticosteroids

C: compared to no corticosteroid administration

O: Effect on rebound anaphylaxis in adults and children, hospital length of stay in pediatric patients, requirement of additional doses of epinephrine in pediatric patients.

Background: Steroids are commonly administered to the majority of patients presenting to emergency departments with anaphylaxis. Their administration is in hopes to achieve the reduction of histamine release by mast cells, thereby improving the symptoms of allergic reactions and anaphylaxis and possibly preventing worsening and theoretical “rebound” reactions. There has been very little data produced to support the use of steroids in these clinical situations.

Trial 1: Grunau BE, Wiens MO, Rowe BH, et al. Emergency Department Corticosteroid Use for Allergy or Anaphylaxis Is Not Associated With Decreased Relapses. *Ann Emerg Med*. 2015;66(4):381-389. doi:10.1016/j.annemergmed.2015.03.003

Pubmed link: <https://pubmed.ncbi.nlm.nih.gov/25820033/>

Validity rating:

The basics: This is a retrospective cohort study that took place at 2 hospitals over 5 years that included any patients seen for anaphylaxis or an allergic reaction.

Exclusion criteria: Younger than 17 years old, pt was not seen by a nurse or physician, pt received an oral steroid prior to presentation, pt had known angioedema, patients admitted to the hospital for greater than 24 hours

Primary Outcome: Allergy related ED visits in the steroid and non-steroid groups

Secondary Outcome: Clinically important biphasic reactions and deaths

Follow up: Pts charts were monitored to see if they returned within a 7 day period with a complaint of allergic reaction or anaphylaxis

Results: Around 2,701 charts were selected for evaluation and around 44% of these patients received steroids. In patients receiving steroids, 5.8% of patients returned to the ED for an allergic reaction while 6.7% of patients in the no steroids group returned (adjusted odds ratio [OR] 0.91; 95% confidence interval). In the total allergy related visits group the NNT to benefit was 176 and in the anaphylaxis subgroup the NNT to benefit was 173. In the steroid group only 4 patients had a clinically significant biphasic reaction while only 1 patient had a biphasic reaction in the nonsteroid group.

Limitations and Bias: Data was collected from only two locations, it is unknown if pts filled and took their steroid prescriptions, it is unknown if pts had re-exposure to an allergen, it is unknown if pts visited another ED for a repeat allergic reaction

Trial 2: Michelson KA, Monuteaux MC, Neuman MI. Glucocorticoids and Hospital Length of Stay for Children with Anaphylaxis: A Retrospective Study. *J Pediatr.* 2015;167(3):719-24.e243. doi:10.1016/j.jpeds.2015.05.033

Pubmed Link: <https://pubmed.ncbi.nlm.nih.gov/26095285/>

Validity Rating: Subject to biases relating to inaccuracies in case ascertainment, data quality, and lack of detailed clinical information. Retrospective study evaluating children from 35 US pediatric hospitals.

Exclusion criteria: Children with a previous ED visit within 3 days for a primary or secondary diagnosis of anaphylaxis, as well as those with missing data regarding hospitalization.

Primary outcomes: Primary outcome among hospitalized patients was prolonged LOS, defined as stay of 2+ days. Among discharged patients, the outcome was a revisit to the ED for a diagnosis of allergic reaction within 3 days of the initial visit, regardless of whether or not the second visit resulted in hospitalization.

Secondary outcomes: Use of parenteral epinephrine in hospitalized patients beyond the first day.

Results: 10,255 total patients, 5203 hospitalized, 5052 discharged from ED. children receiving glucocorticoids were less likely than those who did not receive glucocorticoids to have prolonged LOS (aOR, 0.61; 95% CI, 0.41-0.93). There were many potential confounding variables that could also contribute to prolonged LOS. Glucocorticoid administration was associated with decreased need for additional epinephrine doses in hospitalized patients (aOR, 0.59; 95%CI, 0.36-0.98). Steroid administration was not associated with reduced number of revisits to the ED in discharged patients (unadjusted OR, 1.19; 95% CI, 0.49-2.90; aOR, 1.01; 95% CI,0.50-2.05).

Limitations and biases:

The authors conclude that there may be better definitions and parameters to use in defining what is protracted and biphasic anaphylaxis (PBA), as those who had hospital length of stay less than two days may not have actually had PBA whereas those with longer stays truly did have protracted anaphylaxis. The authors did not limit patients who only received epinephrine in the hospital setting, so patients who received it prehospital may have falsely been classified as anaphylaxis. The authors highlight the reality that it is difficult to objectively analyze physician preference and practice patterns in regards to prescribing steroids in anaphylaxis.