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Rehrer, M. W., Liu, B., Rodriguez, M., Lam, J., & Alter, H. J. (2016). A randomized controlled non-inferiority trial of single dose of oral dexamethasone versus 5 days of oral prednisone in acute adult asthma. *Annals of emergency medicine*, 68(5), 608-613.

Clinical Question: Is a single dose of oral dexamethasone non-inferior to 5 days of prednisone for treatment of asthma exacerbation in adults?

Background: Asthma accounts for more than 2.1 million visits to the emergency department annually. Systemic corticosteroids remain an important treatment for these patients and have shown to reduce relapse rate, length of stay and hospitalization. In order to improve patient adherence to treatment regimen, and thus improve outcomes for patients, it is worthwhile to explore a single treatment option for patients.

Methods: Single center, urban training hospital (Highland Hospital in Oakland, CA), randomized, triple-blinded controlled study conducted between 2011 and 2015. Patient selection by 18-55 years, history of asthma, presented with acute episode of asthma requiring more than 1 nebulizer treatment, discharged home with a valid telephone number. Exclusions for pregnant patients, history of corticosteroids within 2 weeks of presentation, COPD, HIV/AIDS, CHF, pulmonary fibrosis, TB, or diabetes mellitus, interventions including BiPAP/intubation. Patients randomized to treatment arm, prednisone 60 mg for 5 days or PO dexamethasone 12 mg then 4 days of placebo. All pills identical and patients, physician, nurse, pharmacist blinded to treatment arm. Additionally, blinded was the individuals conducting the analysis.

Results: Primary outcome measure was relapse, defined as an unscheduled return visit to a health care provider for additional treatment for persistent or worsening asthma within 14 days. Powered as a non-inferiority study. Intention to treat analysis. Relapse rate for dexamethasone group was 12.1% and for prednisone group 9.8%. Difference of 2.3% with a 95% confidence interval -4.1% to 8.6% which fell outside of the 8% non-inferiority threshold set for the study.

Discussion: Limitations included patients lost to follow up was 20%, outcomes based on telephone follow-up survey and may include some recall bias, study potentially included subjects who had concurrent COPD or other pulmonary problems, dexamethasone group had 4 days of placebo that may have an unaccounted-for effect, and single center study potentially limiting the generalizability of the results. Authors state clearly that this study does not show single dose dexamethasone to be non-inferior to 5 days of oral prednisone. They still feel that single dose dexamethasone is appropriate in the right patient population as they feel that the benefit is derived from compliance with treatment, in addition they feel that the failure of demonstrating non-inferiority was by only a small margin. They site that the relapse rate for prednisone was low compared to national average of 16%. They additionally cited multiple studies that evaluated compliance, one demonstrating that up to 20% of patients do not get their prescriptions filled after leaving the ED (Saunders, 1987) and yet another study demonstrating 50% compliance of oral and inhaled corticosteroids at 7 days following hospitalized treatment for asthma (Krishnan et al, 2004).

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