Recent Research in Asthma

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Steroids and wheezing in 1–5yo's

“Do oral corticosteroids reduce the severity of acute lower respiratory tract illnesses in preschool children with recurrent wheezing? — Beigelman et al, JACI, 2013; 131; 1518–25

- Analyzed two cohorts of children with episodic wheezing participating in clinical trials.

- Compared symptom scores for those illnesses that WERE or WERE NOT treated with oral steroids.
Investigators measured total symptom scores for the most severe episodes.

Found that symptom scores didn't differ between episodes that received anti-inflammatory medications compared to those not treated.

Results were confirmed in evaluating results from another trial using same analysis.
Limitations to the study

- Post-hoc analysis of data from another trial
- ? Steroid dose too low, too short or started too late

“Clinical implications:...OCS treatment might not reduce symptom severity during acute LRTIs in preschool children with recurrent wheeze.”
Steroids and Immunity

- “A Short Burst of Oral Corticosteroid for Children with Acute Asthma: Is There an Impact on Immunity?”
  - Ducharme et al. Pediatric Allergy, Immunology and Pulmonology. 23(4); 243–51.

- Prospective study of 41 children 3–17yo presenting to the ED with acute asthma; 27 received steroids and 17 did not

- All were immunized with 3 antigens (ΦΧ 174, diphtheria and tetanus)
Steroids and Immunity

- Steroid treated children had 85% lower total titers (IgG and IgM) to the new antigen compared to controls.

- There were no differences in the rise of the diphtheria or tetanus titers.

- The ФХ 174 immunization was repeated ~5–6 weeks later; this time, no difference was noted in IgG/IgM levels in both groups.
Findings suggest that naïve T-helper cells are more sensitive to corticosteroids than memory T-cells.
Hygiene Hypothesis
Lactobacillus (and other bacteria)

- “Early life antibiotic-driven changes in microbiota enhance susceptibility to allergic asthma”
  Russell et al. EMBO reports. 13(5); 441–7.
- Further investigation of the Hygiene hypothesis

- Colonization of the GI tract early in life is key in immune system development

- The range of bacteria in the gut of asthmatics is different than non-asthmatics.

- Mouse studies used to investigate these questions.
Neonatal mice were treated with clinical doses of streptomycin and vancomycin. Then looked at the changes in gut flora and airway sensitivity to allergen challenge. Streptomycin had no effect. However, vancomycin treatment reduced the diversity of the gut bacteria and also changed the composition. Also increased severity of asthma.
Lactobacillus (and other bacteria)

- Treatment of adult mice with vancomycin showed no effect on gut microbes and no change in asthma severity.
Lactobacillus (and other bacteria)

- “Childhood Asthma after Bacterial Colonization of the Airway in Neonates”

- Study conducted to evaluate an association between airways colonization and later development of wheeze, asthma and allergy in the first 5 years of life.

- Subjects were children in Copenhagen Prospective Study on Asthma in Childhood
Infants were born to mothers with asthma.
Hypopharyngeal cultures were obtained at 1 month of age.
Samples were evaluated for *S. pneumoniae*, *H. influenzae*, *M. catarrhalis* and *S. aureus*
Diary cards were monitored over the ensuing 5 years.
Blood and serology checked for allergy markers.
Lung function measured at 5yo.
21% of samples were colonized with *Pneumococcus, M. catarrhalis* or *H. influenzae*; these infants had an increased risk for persistent wheeze, severe exacerbation of wheeze and hospitalization for wheezing.

Not true for those infants colonized with *Staph aureus*.

Markers for allergy were also increased in those with the 3 bacteria above.