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## *Selected Summaries*

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### **Nebulized Steroids for Mild-to-Moderate Croup**

[Klassen TP, Feldman ME, Watters LK, Sutcliffe T, Rowe PC. Nebulized budesonide for children with mild-to-moderate croup. *N Engl J Med* 1994, 331: 285-289]

After several decades of debate, the benefit of glucocorticoid therapy in patients hospitalized for croup has been firmly established by the results of four recent randomized clinical trials of intramuscular dexamethasone, oral prednisolone, and nebulized budesonide. However, previous studies have not addressed whether the benefits of glucocorticoid therapy extend to children with milder disease, many of whom are evaluated in emergency departments. The argument against the routine use of glucocorticoids in outpatients has been that the majority of children with croup have self limited illness. It is not known, however, whether treatment at an early stage of the illness would reduce the severity of the clinical symptoms, prevent hospitalization or prolonged visits to the emergency department, and thereby both improve health outcomes and reduce costs. This randomized, double-blind trial compared a nebulized glucocorticoid, budesonide, with placebo in outpatients with mild-to-moderate croup.

Children three months to five years

of age were eligible for the study if their croup scores fell in the mild-to moderate range (scores of 2 to 7 out of a possible 17). The patients were randomly assigned to receive either 2 mg (4 ml) of (nebulized budesonide or 4 ml of nebulized normal saline (27 children); they were then assessed hourly for up to four hours by investigators who were unaware of the assigned treatments.

The median croup score at entry into the study was 4 in both groups. At the final study assessment, the median score was significantly lower in the budesonide group than in the placebo group (1 vs 3;  $p = 0.005$ ). The patients in the budesonide group were discharged from the emergency department significantly earlier than those in the placebo group ( $p = 0.002$ ). One week after enrollment, 21 patients assigned to placebo had received dexamethasone, as compared with 15 patients assigned to budesonide ( $p = 0.10$ ); and 7 patients assigned to placebo had been admitted to the hospital, as compared with 1 patient assigned to budesonide ( $p = 0.05$ ).

The authors conclude that nebulized budesonide leads to a prompt and important clinical improvement in children with mild-to-moderate croup who come to the emergency department.

#### **Comments**

Steroids decrease the capillary endothelial permeability, thus leading to decreased mucosal edema and stabilize the lysosomal membranes, decreasing the inflammatory reaction in

the airways. These are the mechanisms by which steroids improve the outcome in patients with severe croup(1). Since, the pathology in milder cases of croup is also essentially the same, it appears logical that steroids would be useful in milder croup cases also. However, steroids are potentially toxic drugs and need to be prescribed with care in milder illnesses. Hence, there was a need for a double blind controlled trial of steroids in milder cases of croup. With the availability of nebulizing solutions of beclomethasone and budesonide (which are known to have less side-effects than systemic steroids) they form the natural choice for such a trial. This study confirms the efficacy and safety of inhaled budesonide in mild to moderately severe patients of croup.

Nebulizing solution of inhaled steroids are not available in our country at present. But, dexamethasone can be used systemically. Infact even oral dexamethasone has been shown to be as effective and as fast acting as inhaled budesonide(2). The exact mechanism of this rapid response is not understood. An interesting observation in this study has been the quick response to steroids. Improvement was significant within 4 hours. Other studies also confirm this early action of steroids in croup [3 hours(1) or even 2 hours(3)].

Finally, should all patients of croup get steroids? Well, it is believed that any child who requires epinephrine treatment should be given steroids. In milder cases, if steroids are administered to all, it has been estimated that three to five

children will be treated for every one who will benefit(4). Further studies are required for more accurate identification of children likely to respond. Many believe that there are two entities in croup. Spasmodic croup, is a short episode of cough and stridor starting during night without associated signs of infection or fever. On the other hand, acute laryngotracheobronchitis is defined as croup after 12 to 72 hours of cough and coryza, often with accompanying fever. However, there is considerable overlap. Some studies have shown better response of steroids in children with spasmodic croup. Till better criteria are available, at least one dose of steroids (inhaled budesonide or oral/parenteral dexamethasone—0.3 to 0.6 mg/kg) can be recommended for mild, moderate as well as severe cases of croup.

#### REFERENCES

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## Measles Immunization in Egg Allergy

[Aickin R, Hill D, Kep A. Measles immunization in children with allergy to egg. *BMJ* 1994, 309: 223-225.]

Measles and MMR vaccines are produced by passage of virus in a culture of fibroblast cells from chick embryo. Naturally, there is concern about giving the measles vaccine to children with allergy to egg. In this study from Australia, 96 children with egg allergy as diagnosed by history and positive skin allergy test to egg white were administered the measles vaccine. Forty six out of the 96 children had shown positive intradermal test with vaccine. Only one of them developed a minor reaction associated with vaccine administration-An isolated perioral urticaria one hour after vaccination. The authors conclude that measles vaccine can safely be administered to children who are known to be allergic to egg and prior skin testing with the vaccine and desensitization is not required.

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## Comment

In the Indian context, epidemiological need of vaccinating all children against measles was strong enough reason to ignore the history of egg allergy. Further, for operational reasons it was not possible to follow the recommendations of American Academy of Pediatrics(1) to conduct skin tests with the vaccine and do desensitization in those who test positive. Now, we have scientific basis for what we have been doing all along-vaccinating all children against measles irrespective of egg allergy status.

## REFERENCES

1. American Academy of Pediatrics. Hypersensitivity reactions to vaccine constituents. *In: Red Book: Report of the Committee on Infectious Diseases*, 23rd edn. Ed. Peter G, Elk Grove Village, IL, American Academy of Pediatrics; 1994, pp 36-38.

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