double-blind, placebo-controlled, parallel-group study (Kemp JP, Skoner D, Szefler SJ, et al. Ann Allergy Asthma Immunol. 1999;83:231-239). This study retrospectively examines the data more closely and demonstrates that efficacy and safety are not dependent on whether administration is by facemask or mouthpiece. The results here provide reassuring data for clinicians treating children with persistent asthma who are too young to use mouthpieces. Similar results have also been reported for children in this age group with moderate persistent asthma (Mellon M, Lefelin J, Walton-Bowen K, et al. Am J Respir Crit Care Med. 2000;162:593-598).

FRANK S. VIRANT, MD
Seattle, WA

THE EFFECTIVENESS OF HIGH-DOSE INHALED Budesonide Therapy in the Treatment of Acute Asthma Exacerbations in Children


Purpose of the Study. The purpose of this study was to evaluate the efficacy of high-dose inhaled budesonide, in comparison to oral methylprednisolone, in the treatment of acute asthma exacerbations in children.

Study Population. Sixty children, ages 4 to 17 years, who had experienced an acute asthma exacerbation over a period of 6 months. All patients met the American Thoracic Society criteria for asthma.

Methods. Children who experienced an acute asthma attack unresponsive to home management, yet not severe enough to be hospitalized, were randomized into 2 groups. Group 1 received high-dose inhaled budesonide (1600 μg daily) plus dry powder terbutaline (2000 μg daily). Group 2 received oral methylprednisolone (1 mg/kg/day) plus inhaled budesonide (800 μg daily) plus dry powder terbutaline (2000 μg daily). Both groups were evaluated before treatment and 4 days after 3 complete days of treatment.

Pre- and posttreatment pulmonary index scores, forced expiratory volume in 1 second (FEV₁), forced vital capacity (FVC), FEV₁/FVC and forced expiratory flow 25%-75% (FEF₂₅₋₇₅%) were evaluated. Pulmonary index scoring (PIS) evaluated the physical examination findings of respiratory rate, severity of wheezing, inspiration/expiration ratio, and the use of accessory muscles.

Results. Thirty-one patients were in the high-dose budesonide group and 29 were in the methylprednisolone group. There were no significant differences in the demographics of the 2 groups, including such characteristics as age of disease onset, mean number of acute attacks in previous year and duration of symptoms at presentation. There were no significant differences between the 2 groups with respect to baseline PIS, FEV₁, FEV₁/FVC, or FEF₂₅₋₇₅%. A statistically significant decrease in PIS and a statistically significant increase in FEV₁, FEV₁/FVC, or FEF₂₅₋₇₅% were detected in both groups after 4 days of treatment. Comparison of the 2 groups revealed that the mean decrease in the PIS was 2.61 ± 1.12 in the group receiving high-dose budesonide and 1.90 ± 1.08 in the group receiving oral steroids (P = .038). No statistically significant differences were detected between the 2 groups with respect to the increase in lung function measurements (FEV₁, FEV₁/FVC, or FEF₂₅₋₇₅%). None of the patients who had received high-dose budesonide required treatment with oral steroids. During the follow-up period, 3 patients in the high-dose budesonide group and 8 patients in the oral steroids group needed to continue their therapy for 2 additional days because of incomplete recovery.

Conclusion. Short-term high-dose budesonide therapy can be considered as an alternative for children who are experiencing an acute asthma attack that is unresponsive to home management with regular use of inhaled β₂-agonist, yet who are not severe enough to hospitalize.

Reviewer’s Comments. This study supports an earlier study that demonstrated that high-dose budesonide was as effective as oral prednisolone over a 1 week period. An interesting finding in this shorter study is that with respect to clinical improvement, high-dose budesonide may be more effective than oral steroids plus medium-dose budesonide. Parents are extremely concerned about the use of steroids and the use of high-dose inhaled for mild exacerbations instead of oral steroids will most likely be well-received. This study is on the right track for future therapeutic options, although it should be noted that these patients only had mild exacerbations and that the results cannot necessarily be extrapolated to more severe episodes.

HELEN SKOLNICK, MD
Princeton, NJ

BONE DENSITY IN ASTHMATIC CHILDREN TREATED WITH INHALED CORTICOSTEROIDS


Purpose of the Study. Inhaled corticosteroids (ICS) have been shown to have some systemic absorption and thus have some potential for adverse effects on bone density.

Study Population. A total of 20 prepubertal children (11 girls, 9 boys; aged 4–9 years, median age: 7.6 years) with chronic asthma taking moderate-to-high-dose ICS for at least 12 months. The average doses used in μg/m²/day were beclomethasone 778 (n = 5), budesonide 819 (n = 9) and fluticasone 444 (n = 6).

Methods. Bone mineral density of vertebrae and distal radius measured by quantitative computed tomography. Bone mineral density values as well as heights were transformed into standard deviation scores and compared with normal values from healthy children.

Results. The values for bone mineral density, as well as for height, were not different than the expected values for normal children.

Conclusion. “ICS do not adversely affect bone mineral density in prepubertal asthmatic children.”

Reviewer’s Comments. We should still use as low a dose of ICS as possible, but this is yet another reassuring study that these very effective drugs are also very safe.

JOHN M. KELSO, MD
San Diego, CA

PERSISTENT WHEEZING IN INFANTS WITH AN ATOPIC TENDENCY RESPONDS TO INHALED FlUTICASONE


Purpose of the Study. To investigate the effect of inhaled fluticasone in a group of infants with significant wheezing at high risk of progressing to childhood asthma.

Study Population. A total of 52 infants between the ages of 3 to 12 months were recruited. Only 37 completed the study.

Methods. Study entry criteria also included a documented history of persistent wheeze, occurring at least 3
The Effectiveness of High-Dose Inhaled Budesonide Therapy in the Treatment of Acute Asthma Exacerbations in Children
Helen Skolnick

*Pediatrics* 2002;110:461

<table>
<thead>
<tr>
<th>Updated Information &amp; Services</th>
<th>including high resolution figures, can be found at: /content/110/Supplement_2/461.3.full.html</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subspecialty Collections</td>
<td>This article, along with others on similar topics, appears in the following collection(s):</td>
</tr>
<tr>
<td></td>
<td>Allergy/Immunology</td>
</tr>
<tr>
<td></td>
<td>/cgi/collection/allergy:immunology_sub</td>
</tr>
<tr>
<td></td>
<td>Asthma</td>
</tr>
<tr>
<td></td>
<td>/cgi/collection/asthma_sub</td>
</tr>
<tr>
<td>Permissions &amp; Licensing</td>
<td>Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: /site/misc/Permissions.xhtml</td>
</tr>
<tr>
<td>Reprints</td>
<td>Information about ordering reprints can be found online: /site/misc/reprints.xhtml</td>
</tr>
</tbody>
</table>
The Effectiveness of High-Dose Inhaled Budesonide Therapy in the Treatment of Acute Asthma Exacerbations in Children

Helen Skolnick

*Pediatrics* 2002;110;461

The online version of this article, along with updated information and services, is located on the World Wide Web at:

/content/110/Supplement_2/461.3.full.html