shorter length of stay compared with patients treated with prednisolone. Of the subjects treated with dexamethasone, those who received it in the first 60 minutes had a mean 34-minute decrease in length of stay compared with those treated with prednisolone. Early treatment with albuterol within 60 minutes or after did not affect length of stay.

CONCLUSIONS. Early corticosteroid administration within 60 minutes of triage in pediatric patients with asthma exacerbations was associated with a significant decrease in the overall length of stay. This study suggested that choice of oral corticosteroid, dexamethasone over prednisolone, may also affect the length of stay.

REVIEWER COMMENTS. Previous studies have found early corticosteroid administration to lessen admission rates to the hospital. Although this study did not show a difference in admission rates, this study did support early corticosteroid administration within the emergency department to help lessen length of stay. Properties of dexamethasone make it appear superior to prednisolone, but prospective randomized trials are necessary, as previous studies did not show significant improvements for decrease in length of stay or in admissions. As treatment protocols become more common, a prospective study that validates early use of oral corticosteroids and choice of oral steroid, dexamethasone over prednisolone, may also affect the length of stay.

METHODS. The calculated differences in adult height for each active treatment group as compared with placebo was done using multiple linear regression with adjustment for demographic characteristics, asthma features, and height at trial entry.

RESULTS. Mean adult height was 1.2 cm lower (95% confidence level –1.9 to –0.5) in the budesonide group than in the placebo group \( (P = .001) \) and 0.2 cm lower (95% confidence level 0.9 to 0.5) in the nedocromil group than in the placebo group \( (P = .61) \). During the first 2 years, decreased growth velocity in the budesonide group occurred primarily in prepubertal girls.

CONCLUSIONS. The initial decrease in attained height associated with the use of ICS in prepubertal children persisted as a reduction in adult height, but the decrease was not progressive or cumulative.

REVIEWER COMMENTS. This observation in 91% of the best characterized group of mild to moderate asthmatic individuals gives information that the effect on growth velocity seen in the first 1 to 2 years of treatment is not cumulative. These data cannot be extended to other ICS products with different delivery systems.

Impact of Intranasal Corticosteroids on Asthma Outcomes in Allergic Rhinitis: A Meta-analysis

PURPOSE OF THE STUDY. To perform an updated systematic review with meta-analysis to assess the impact of intranasal corticosteroid (INCS) medications on asthma outcomes in patients with allergic rhinitis and asthma.

METHODS. A systematic review and meta-analysis were performed on articles published before May 2012. Randomized controlled trials evaluating the efficacy of intranasal corticosteroids in children and adults were identified from PubMed, Cochrane, and Medline databases and were assessed for systematic bias. Studies were included if they assessed at least 1 asthma-specific clinical outcome and had 1 of the following interventions: (1) INCS spray versus placebo, (2) INCS spray plus orally inhaled corticosteroids versus orally inhaled steroids alone, and (3) nasally inhaled corticosteroids (deliver medication to both nasal and lower airway tracts) versus placebo.

RESULTS. Twenty-three clinical trials were identified, and 18 studies were included in the analysis (9 of them were pediatric or included children), for a total of 2162 individuals. When looking at the studies comparing INCS spray to placebo without concurrent treatment

Effect of Inhaled Glucocorticoids in Childhood on Adult Height

PURPOSE. Inhaled glucocorticoids (ICS) have been shown to have a temporary decrease in linear growth velocity in children. The effect of ICS on adult height has not been well defined.

STUDY POPULATION. Participants (943 of 1041) in the Childhood Asthma Management Program study were enrolled between December 1993 and September 1995. They were between 5 and 13 years of age at that time with mild to moderate asthma. They were randomized to 1 of 3 study groups: either budesonide 400 \( \mu g \) per day via dry-powder inhaler, nedocromil 16 mg per day via pressurized metered dose inhaler, or placebo. The length of the study was 4 to 6 years.

METHODS. The calculated differences in adult height for each active treatment group as compared with placebo was done using multiple linear regression with adjustment for demographic characteristics, asthma features, and height at trial entry.

RESULTS. Mean adult height was 1.2 cm lower (95% confidence level –1.9 to –0.5) in the budesonide group than in the placebo group \( (P = .001) \) and 0.2 cm lower (95% confidence level 0.9 to 0.5) in the nedocromil group than in the placebo group \( (P = .61) \). During the first 2 years, decreased growth velocity in the budesonide group occurred primarily in prepubertal girls.

CONCLUSIONS. The initial decrease in attained height associated with the use of ICS in prepubertal children persisted as a reduction in adult height, but the decrease was not progressive or cumulative.

REVIEWER COMMENTS. This observation in 91% of the best characterized group of mild to moderate asthmatic individuals gives information that the effect on growth velocity seen in the first 1 to 2 years of treatment is not cumulative. These data cannot be extended to other ICS products with different delivery systems.
with inhaled corticosteroids, INCS spray significantly improved forced expiratory volume in 1 second, bronchial reactivity, asthma symptom scores, and rescue medication use. However, there were no significant changes in asthma outcomes with the addition of INCS spray to inhaled corticosteroids.

CONCLUSIONS. The results of this systematic review and meta-analysis show that the use of INCS sprays improves some asthma-related outcomes in individuals with allergic rhinitis and asthma. This appears to be most efficacious when patients are not already on daily inhaled corticosteroids.

REVIEWER COMMENTS. The 2010 Allergic Rhinitis and its Impact on Asthma guidelines recommended using INCS sprays for the management of allergic rhinitis, but did not find sufficient evidence to support their use for asthma. This study looked specifically at the impact of INCS on asthma symptoms and included data from several new studies that had been published since 2010. INCS sprays were found to improve some asthma outcomes, but this was most apparent in individuals who were not already on inhaled corticosteroids. Inhaled corticosteroids remain the mainstay of treatment of asthma.


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Effect of Clarithromycin on Acute Asthma Exacerbations in Children: An Open Randomized Study

PURPOSE OF THE STUDY. The aim of this pilot study was to assess the effect of a 3-week course of clarithromycin as an add-on to regular treatment, on symptom-free days and lung function, in asthmatic children experiencing an acute exacerbation.

STUDY POPULATION. Participants included 40 children, ages 6 to 14 years, followed by the Allergy Department at the second pediatric clinic of the University of Athens with intermittent or mild persistent asthma, who presented with an acute asthma exacerbation during a predefined 2-year period.

METHODS. This was a prospective, open-label, randomized pilot study. Participants were randomized to 2 groups. The first group received 15 mg/kg of clarithromycin for 3 weeks in addition to their regular exacerbation treatment. The second received only their regular exacerbation treatment. Children were followed with diary cards for 12 weeks. Lung function was assessed at study entry, and 3 and 12 weeks after the index exacerbation. Nasal wash samples were collected at study entry and reverse transcriptase polymerase chain reaction was performed for respiratory viruses and atypical bacteria.

RESULTS. Of the 40 children enrolled, 18 were treated with clarithromycin. The children in the clarithromycin treatment group had significantly more symptom-free days (78 vs 69 days, \( P < .0001 \)) and fewer periods with loss of asthma control (9 vs 19, \( P = .013 \)) compared with controls. Also, time to first period of loss of control was prolonged in the clarithromycin group (67.5 vs 26.5 days, \( P = .003 \)). Furthermore, the severity of symptoms was lower in the clarithromycin treatment group versus the control group during the first period with loss of control, but not during subsequent periods of loss of control. The duration of the index episode of asthma exacerbation was significantly shorter in the clarithromycin group compared with the control group (5.0 vs 7.5 days, \( P < .00001 \)) as well. There were no significant differences in lung function between the groups and detection of respiratory syncytial virus did not modify the outcomes in either the clarithromycin group or the control group. The participants in the clarithromycin group were slightly more likely to receive concurrent oral corticosteroids (16/18 vs 14/22, \( P = .067 \)); however, even after adjusting for corticosteroid use, clarithromycin administration was associated with 10.9 more symptom-free days than in the control group.

CONCLUSIONS. In this unblinded study, the addition of a 3-week course of clarithromycin to regular treatment of an acute asthma exacerbation was associated with decreased duration of the asthma exacerbation, increase in symptom-free days after the exacerbation, and reductions in the number and severity of days with loss of control after the initial exacerbation. Addition of clarithromycin had no effect on lung function.

REVIEWER COMMENTS. This study showed that a 3-week course of clarithromycin, added to usual therapy for an acute asthma exacerbation in children, is effective in reducing the duration of the exacerbation as well as in reducing subsequent symptoms, both in severity and in number of days with symptoms, over a 3-month follow-up period. However, the study was unblinded and beneficial effects of clarithromycin were observed for self-reported outcomes and not for lung function, so it is possible that the observed treatment effects were a result of bias. Further studies using blinded, randomized control trials should be performed to assess for the efficacy and safety of clarithromycin add-on therapy for acute asthma exacerbations in children.

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