have been remorselessly over-prescribed to infants. These new papers should not suffer the same fate.

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Do inhaled steroids affect growth?

Review of "Linear growth in prepubertal asthmatic children treated with montelukast, beclomethasone, or placebo: a 56-week randomized double-blind study." Becker A. et al. for the Montelukast Linear Growth Study Group. *Ann Allergy Asthma Immunol*. 2006;96:800–807

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This was a thirty-centre study of 360 boys (6.4 to 9.4 yrs) and girls (6.4 to 8.4yrs) with mild persistent asthma. Inclusion criteria were: Tanner development stage I with heights and weights between the 5th and 95th centiles; bone age (based on x-ray of left hand and wrist) being within two years of chronologic age; mild persistent asthma according to GINA guidelines; and a pre-beta agonist FEV1 of at least 75%. Exclusion criteria were: no current respiratory infection; no other pulmonary disease; no severe chronic sinus disease

or nasal polyps; and no use of 21 medications that could affect growth (for example, anticonvulsants) or asthma (for example, nasal steroids). These age groups were chosen since they exhibit lesser variability of growth velocity.

After a placebo run-in period, the 360 children were randomized in equal ratios to double-blind, double-dummy treatment with placebo, beclomethasone 200 mcg twice-daily, or 5mg montelukast daily, for 56 weeks. The primary endpoint was linear growth velocity. Measurements were also made of markers of bone turnover including serum osteocalcin (bone formation), and urinary N-telopeptide-creatinine ratio (bone resorption).

The study was designed to estimate the difference in linear growth rates between the montelukast and placebo groups with reasonable precision. Specifically, for 100 patients per treatment group, the half-length of the 95% CI for the difference in linear growth rates between the montelukast and placebo groups was expected to be 0.28cm per year based on an SD of 1 cm per year. The study had 80% power to detect a difference in growth of 0.4cm per year between the beclomethasone and placebo groups.

Results: Linear bone growth rate was lower with beclomethasone than placebo or montelukast. Osteocalcin levels were lower in the beclomethasone group than the others. Beta-agonist use and oral steroid rescue were higher in the placebo group than both other groups.

Conclusion: While allowing comparable control, montelukast did not affect linear growth in prepubertal mild persistent asthmatic children over a period of 56 weeks, whereas beclomethasone did. Markers of bone formation were lower in the beclomethasone group.

Commentary

It is well known that inhaled corticosteroids (ICS) can reduce growth velocity in the first year of treatment [1], and that then there is a catch-up phase [2,3]. Some clinicians remain concerned that the attained adult height is lower than target height in asthmatics treated with ICS in childhood [4]. Growth is also slowed in children with severe asthma, at least partly due to the effects of chronic disease.

This study tells us that low dose ICS in the first year of treatment does cause some growth delay, and that mild asthma does not seem to

cause growth delay by itself – though we would have needed a comparable non-asthmatic cohort to make this claim definitively. In addition, montelukast allows reasonable parameters of asthma control with decreased beta-agonist use and exacerbations (oral steroid rescues) comparable with low dose ICS.

Previous studies [5–7] comparing montelukast with ICS have found a greater beneficial effect on FEV1 with ICS, especially if the pre-treatment FEV1 was reduced. We also know that some patients will respond to ICS and not leukotriene receptor antagonists (LTRAs), and vice versa [5].

This study does not provide enough evidence for LTRAs to replace ICS treatment as first-line therapy. However, it does suggest that, contrary to most guidelines internationally, LTRA therapy could be initial monotherapy for mild persistent asthma, especially in those children with well-preserved lung function. In those patients who do respond to LTRAs, ongoing therapy may even have some advantages.

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