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Original Article

Can a single dose response predict the effect of montelukast on exercise-induced bronchoconstriction?

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The study was performed at the Medisch Spectrum Twente, Enschede, the Netherlands.

Preliminary results from this study were previously presented at the American Thoracic Society annual congress, San Fransisco 2012.

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Summary

Rationale

Exercise-induced bronchoconstriction (EIB) can be prevented by a single dose of montelukast (MLK). The effect is variable, similar to the variable responsiveness observed after daily treatment with MLK. We hypothesized that the effect of a single MLK-dose (5 or 10 mg) on EIB could predict the clinical effectiveness of longer term once daily treatment.

Methods

This was a prospective, open-label study. Twenty-four asthmatic adolescents (12–17 years) suboptimally controlled by low-dose inhaled corticosteroids, with ≥10% post-exercise fall in FEV_1, were included. They performed an exercise test at baseline, 20 hr after a single MLK-dose and 40–44 hr after the last dose of 4 weeks once daily treatment. The correlations between the effect of a single dose and 4 weeks treatment on area under the curve (AUC) and maximum % fall in FEV_1 were calculated.

Results

$AUC_{0–20\ min}$ decreased significantly after a single MLK-dose (P = 0.001, CI: 64.9–218.2), but not after 4 weeks of treatment (P = 0.080, CI: −12.2 to 200.4). There was a moderate correlation between the effect of a single MLK-dose and 4 weeks treatment on $AUC_{0–20\ min}$, r = 0.49 (P = 0.011), and maximum % fall in FEV_1, r = 0.40 (P = 0.035).

Conclusion

The protection provided by a single MLK-dose against EIB only modestly predicts the effect of regular treatment against EIB in adolescent asthmatics on low-dose inhaled corticosteroids. If used on a daily base, MLK offered clinically significant protection against EIB in two thirds of adolescents suboptimally controlled by low-dose ICS. **Pediatr Pulmonol. 2015;9999:XX–XX**. © 2015 Wiley Periodicals, Inc.

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