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Title: The remarkable role of adherence to inhaled corticosteroids in achieving asthma control in young children with asthma

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Body: Introduction Adherence to inhaled corticosteroids is a predictor of asthma control. However, the role of adherence in maintaining long-term asthma control is largely unstudied. This study was designed to explore the relationship between adherence to inhaled corticosteroids and long-term asthma control in young children with asthma. Methods 2–6-yr-old asthmatic children, using inhaled corticosteroids (ICS), enrolled in a program with extensive self-management training and close follow-up were included. Adherence was measured daily for 12 months using Smartinhaler® devices. Long-term asthma control was assessed by parents and physicians and included clinical assessment, asthma control questionnaire, and lung function. In children still using ICS one year after the study, we examined the association of adherence to short-term and long-term asthma control, adjusting for seasonal influences and clinical characteristics. Results Of the 81 children in which adherence rates were measured, 50 children had persistent use of ICS at least until one year after the study. Median (interquartile range) adherence was 87% (61-94%), and 36 (72%) children had well-controlled asthma throughout follow-up. Adherence >80% was associated with better asthma control, and we found no important confounders of this association. Children with persistent mild symptoms had lower adherence rates (p=0.028). Conclusion Comprehensive asthma care was associated with good asthma control in most children. Adherence to inhaled corticosteroids was an independent strong predictor of long-term asthma control, with highest levels of asthma control found in children with adherence >80% of doses prescribed.