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Title: Lower incidence of asthma exacerbations with F_ENO-guided anti-inflammatory treatment: A randomised controlled trial

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Body: We examined the effects of anti-inflammatory treatment guided by fractional exhaled nitric oxide (F_ENO) on asthma outcomes in adult patients with allergic asthma. This was a primary health care multicentre study (17 sites). 181 non-smoking participants (18-64 years) with perennial allergy and regular inhaled corticosteroid (ICS) treatment were randomly assigned to two treatment arms: a control group (n=88) where F_ENO was blinded for both patient and physician and the anti-inflammatory treatment (ICS and leukotriene receptor antagonists) adjusted according to routine clinical practice, and an active group (n=93) where the anti-inflammatory treatment was adjusted according to F_ENO. Participants were followed for one year (5 visits). F_ENO was measured and questionnaires on asthma-related quality of life (mini-AQLQ) and asthma control (6-item ACQ) were completed. Health care contacts and asthma events were noted at every visit. The primary endpoint mini-AQLQ overall score over one year did not differ between the groups at last visit (p=0.20), whereas the mini-AQLQ symptom domain score (p=0.041) and the ACQ score (p=0.045) improved significantly more in the F_ENO-guided group than in the control group. Furthermore, a significantly lower cumulative incidence of exacerbations was found in the F_ENO-guided group vs. control group (p=0.029). This was dependent on a reduction in moderate (p=0.006) but not severe (p=0.73) exacerbations. Mean use of ICS over the study period was similar in the two groups (p=0.95). Using F_ENO to guide anti-inflammatory treatment reduced exacerbation frequency and improved asthma control in adults with atopic asthma without increasing overall ICS use.