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Using fractional exhaled nitric oxide to guide step-down treatment decisions in patients with asthma: a systematic review and individual patient data meta-analysis

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In nonsmoking patients with mild-to-moderate well-controlled asthma, stepping down treatment when F_{ENO} is <50 ppb reduces prescribing of inhaled corticosteroids without increasing exacerbations <http://bit.ly/2SKaxSt>

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ABSTRACT

Background: High exhaled nitric oxide fraction (F_{ENO}) levels are associated with greater risk of asthma exacerbation. However, it is not clear how F_{ENO} can be used to guide safe reductions in inhaled corticosteroid (ICS) doses in asthma patients. This study assesses the ability of F_{ENO} to guide ICS reductions.

Methods: Systematic searching of electronic databases identified prospective observational studies and randomised controlled trials which recruited participants with mild-to-moderate asthma aged ≥ 12 years and measured F_{ENO} before reducing ICS. We performed multilevel mixed-effects logistic regression in relation to acute exacerbations and estimated each participant's exacerbation risk using our logistic

regression model.

Results: We included data from seven out of eight eligible studies, representing 384 participants. ICS doses were halved in four studies and withdrawn in three studies. A baseline F_{ENO} measurement of ≥ 50 ppb was associated with increased risk of exacerbations (crude OR 3.14, 95% CI 1.41–7.00, $p=0.005$; adjusted OR 3.08, 95% CI 1.36–6.98, $p=0.007$) and corresponded to an estimated exacerbation risk cut-off of 15%. Reducing ICS when estimated exacerbation risk was $<15\%$ *versus* $<10\%$ would result in fewer patients remaining on the same ICS dose (40 (10.4%) out of 384 *versus* 141 (36.7%) out of 384), but similar proportions of patients avoiding exacerbations (222 (91.4%) out of 243, 95% CI 87.1–94.6% *versus* 311 (90.4%) out of 344, 95% CI 86.8–93.3%).

Conclusion: In patients with mild-to-moderate asthma, gradual ICS reduction when F_{ENO} is <50 ppb may help decrease ICS use without increasing exacerbations. Future research should aim to validate these findings in larger populations.