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Change in blood eosinophils following treatment with inhaled corticosteroids may predict long-term clinical response in COPD

Alexander G. Mathioudakis^{1,2}, Andras Bikov^{1,2}, Philip Foden³, Lies Lahousse⁴, Guy Brusselle^{5,6}, Dave Singh^{1,2,7} and Jørgen Vestbo^{1,2}

Affiliations: ¹Division of Infection, Immunity and Respiratory Medicine, School of Biological Sciences, The University of Manchester, Manchester, UK. ²North West Lung Centre, Wythenshawe Hospital, Manchester University NHS Foundation Trust, Manchester Academic Health Science Centre, Manchester, UK. ³Dept of Medical Statistics, Wythenshawe Hospital, Manchester University NHS Foundation Trust, Manchester, UK. ⁴Dept of Bioanalysis, Ghent University, Ghent, Belgium. ⁵Depts of Epidemiology and Respiratory Medicine, Erasmus Medical Center, Rotterdam, the Netherlands. ⁶Dept of Respiratory Medicine, Ghent University Hospital, Ghent, Belgium. ⁷Medicines Evaluation Unit, Manchester, UK.

Correspondence: Jørgen Vestbo, Division of Infection, Immunity and Respiratory Medicine, The University of Manchester, Southmoor Road, M23 9LT, Manchester, UK. E-mail: jorgen.vestbo@manchester.ac.uk



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Blood eosinophil change in response to ICS may predict long-term response to ICS in COPD. A rise in eosinophils was observed in 20% of participants in ISOLDE and was associated with lack of clinical benefit and a potential risk of harm. <http://bit.ly/3bPKLnD>

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ABSTRACT There is an emerging role for blood eosinophil count (EOS) as a biomarker to guide inhaled corticosteroid (ICS) therapy in COPD. Since ICS administration could influence EOS, we hypothesised that change in EOS following treatment with ICS may predict outcomes of long-term therapy.

In a *post hoc* analysis of ISOLDE, a 3-year, double-blind trial comparing 500 µg fluticasone propionate twice daily with placebo in 751 patients with moderate-to-severe COPD, we evaluated whether the initial changes in EOS during ICS treatment were predictive of ICS treatment response.

EOS change within 1 year after the introduction of ICS was strongly predictive of treatment response. A suppressed EOS was associated with treatment effect. Characteristically, in patients with EOS suppression of ≥ 200 cells· μL^{-1} , ICS use was associated with a decelerated rate of decline of forced expiratory volume in 1 s (FEV₁), by 32 mL·year⁻¹, and a 30% reduction in the exacerbation rate. In contrast, in patients experiencing an increase in EOS of ≥ 200 cells· μL^{-1} , ICS use was associated with an accelerated rate of decline of FEV₁, by 37 mL·year⁻¹ and an 80% increase in the exacerbation rate ($p < 0.0001$). EOS change was not predictive of clinical response with regards to health status evaluated using the St George's Respiratory Questionnaire.

These findings suggest that EOS change after ICS administration may predict clinical response to ICS therapy in patients with moderate-to-severe COPD at risk of exacerbations. ICS administration may be associated with more frequent exacerbations and an accelerated lung function decline in the 20% of patients in whom EOS increases after the administration of ICS. These hypothesis-generating observations will need validation in prospectively designed studies.

The ISOLDE trial was conducted before the ICJME recommended a prospective registration of RCT protocols.