Blood eosinophil counts in the general population and airways disease: a comprehensive review and meta-analysis

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Shareable abstract (@ERSpublications)
Blood eosinophil (EOS) counts are of interest as asthma/COPD treatment–response biomarkers. This comprehensive review describes EOS distributions/ranges published in asthma/COPD, controls and the general population. https://bit.ly/3ph1G9M

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Abstract

Background The clinical context for using blood eosinophil (EOS) counts as treatment–response biomarkers in asthma and COPD requires better understanding of EOS distributions and ranges. We describe EOS distributions and ranges published in asthma, COPD, control (non-asthma/COPD) and general populations.

Methods We conducted a comprehensive literature review and meta-analysis of observational studies (January 2008 to November 2018) that included EOS counts in asthma, severe asthma, COPD, control and general populations. Excluded studies had total sample sizes <200, EOS as inclusion criterion, hospitalised population only and exclusively paediatric participants.

Results Overall, 91 eligible studies were identified, most had total-population-level data available: asthma (39 studies), severe asthma (12 studies), COPD (23 studies), control (seven studies) and general populations (14 studies); some articles reported data for multiple populations. Reported EOS distributions were right-skewed (seven studies). Reported median EOS counts ranged from 157–280 cells·μL^{-1} (asthma, 22 studies); 200–400 cells·μL^{-1} (severe asthma, eight studies); 150–183 cells·μL^{-1} (COPD, six studies); and 100–160 cells·μL^{-1} (controls, three studies); and 100–200 cells·μL^{-1} (general populations, six studies). The meta-analysis showed that observed variability was mostly between studies rather than within studies. Factors reportedly associated with higher blood EOS counts included current smoking, positive skin-prick test, elevated total IgE, comorbid allergic rhinitis, age ⩽18 years, male sex, spirometric asthma/COPD diagnosis, metabolic syndrome and adiposity.

Conclusion EOS distribution and range varied by study population, and were affected by clinical factors including age, smoking history and comorbidities, which, regardless of severity, should be considered during treatment decision-making.