Mepolizumab effectiveness and identification of super-responders in severe asthma


Affiliations: 1Centre of Excellence in Severe Asthma and Priority Research Centre for Healthy Lungs, Faculty of Health, University of Newcastle, Newcastle, Australia. 2Dept of Respiratory and Sleep Medicine, John Hunter Hospital, Newcastle, Australia. 3Faculty of Medicine, Nursing and Health Sciences, Monash University, Clayton, Australia. 4Dept of Thoracic Medicine, Frankston Hospital, Frankston, Australia. 5School of Medicine, Western Sydney University, Campbelltown, Australia. 6Immunology and Allergy Unit, Campbelltown Hospital, Campbelltown, Australia. 7Dept of Thoracic Medicine, Concord Hospital, Concord, Australia. 8Allergy, Asthma and Clinical Immunology, Alfred Health, Melbourne, Australia. 9Dept of Respiratory and Sleep Medicine, Royal Prince Alfred Hospital, Camperdown, Australia. 10Respiratory Dept, St Vincent’s Hospital, Melbourne, Australia. 11Lung and Sleep Medicine, Monash University and Medical Centre, Clayton, Australia. 12Lung Research, Hans Institute and Dept of Thoracic Medicine, Royal Adelaide Hospital, Adelaide, Australia. 13Dept of Respiratory Medicine, Princess Alexandra Hospital, Woolloongabba, Australia. 14The University of Queensland Diamantina Institute, Woolloongabba, Australia. 15South Western Sydney Clinical School, University of New South Wales, Sydney, Australia. 16Ingham Institute for Applied Medical Research, Sydney, Australia. 17Dept of Respiratory Medicine, Mater Hospital Brisbane, South Brisbane, Australia. 18Respiratory and Sleep Services, Flinders Medical Centre and Flinders University, Bedford Park, Australia. 19Dept of Sleep and Respiratory Medicine, Westmead Hospital, Westmead, Australia. 20School of Medicine, The University of Sydney, Sydney, Australia. 21Dept of Respiratory Medicine, Fiona Stanley Hospital, Murdoch, Australia. 22Concord Clinical School University of Sydney, Concord, Australia. 23St George Specialist Centre, Kogarah, Australia. 24St George and Sutherland Clinical School, University of New South Wales, Sydney, Australia. 25Woolcock Institute of Medical Research, Glebe, Australia. 26Austin Health and Monash University, Melbourne, Australia. 27St Vincent’s Clinic, Darlinghurst, Australia.

Correspondence: Peter G. Gibson, Hunter Medical Research Institute, Lot 1 Kookaburra Circuit, New Lambton Heights NSW 2305, Australia. E-mail: peter.gibson@health.nsw.gov.au

In clinical practice, mepolizumab reduces the burden of severe eosinophilic asthma by reducing severe exacerbations and improving asthma control, quality of life and lung function. Super-responders have a T2 phenotype and few comorbidities.


This single-page version can be shared freely online.
The Australian Mepolizumab Registry (AMR) was established with an aim to assess the use, effectiveness and safety of mepolizumab for severe eosinophilic asthma in Australia.

Patients (n=309) with severe eosinophilic asthma (median age 60 years, 58% female) commenced mepolizumab. They had poor symptom control (median Asthma Control Questionnaire (ACQ)-5 score of 3.4), frequent exacerbations (median three courses of oral corticosteroids (OCS) in the previous 12 months), and 47% required daily OCS. Median baseline peripheral blood eosinophil level was 590 cells·µL\(^{-1}\). Comorbidities were common: allergic rhinitis 63%, gastro-oesophageal reflux disease 52%, obesity 46%, nasal polyps 34%.

Mepolizumab treatment reduced exacerbations requiring OCS compared with the previous year (annualised rate ratio 0.34 (95% CI 0.29–0.41); p<0.001) and hospitalisations (rate ratio 0.46 (95% CI 0.33–0.63); p<0.001). Treatment improved symptom control (median ACQ-5 reduced by 2.0 at 6 months), quality of life and lung function. Higher blood eosinophil levels (p=0.003) and later age of asthma onset (p=0.028) predicted a better ACQ-5 response to mepolizumab, whilst being male (p=0.031) or having body mass index ≥30 (p=0.043) predicted a lesser response. Super-responders (upper 25% of ACQ-5 responders, n=61, 24%) had a higher T2 disease burden and fewer comorbidities at baseline.

Mepolizumab therapy effectively reduces the significant and long-standing disease burden faced by patients with severe eosinophilic asthma in a real-world setting.