Discrete-Event Simulation Model Projects Economic Outcomes Associated with Long-term Clinical Remission in Patients with Severe Asthma Receiving Mepolizumab

The impact of **mepolizumab** on **clinical remission** in patients with **severe asthma** was **modeled** in this study for the **first time; economic benefits** associated with **clinical remission** in severe asthma were predicted

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Digital poster

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Kejsi Begaj[1,2], Alan Martin[3], Samantha N Valliant[1]*, Niels Dunnewind[4]*, Matthew Knowles[5]*, Disha Jain[6], Martijn JHG Simons[4], Craig Bennison[5], Rafael Alfonso-Cristancho[1]

[1]Global Real-World Evidence and Health Outcomes Research, GSK, Collegeville, PA, USA; [2]Centre for Health Outcomes, Policy, and Economics, Rutgers University, Piscataway, NJ, USA; [3]Global Real-World Evidence and Health Outcomes Research, GSK, London, UK; [4]Evidence and Access, OPEN Health, Rotterdam, Netherlands; [5]Evidence and Access, OPEN Health, London, UK; [6]Evidence and Access, OPEN Health, New Delhi, India
*Affiliation at the time of the study

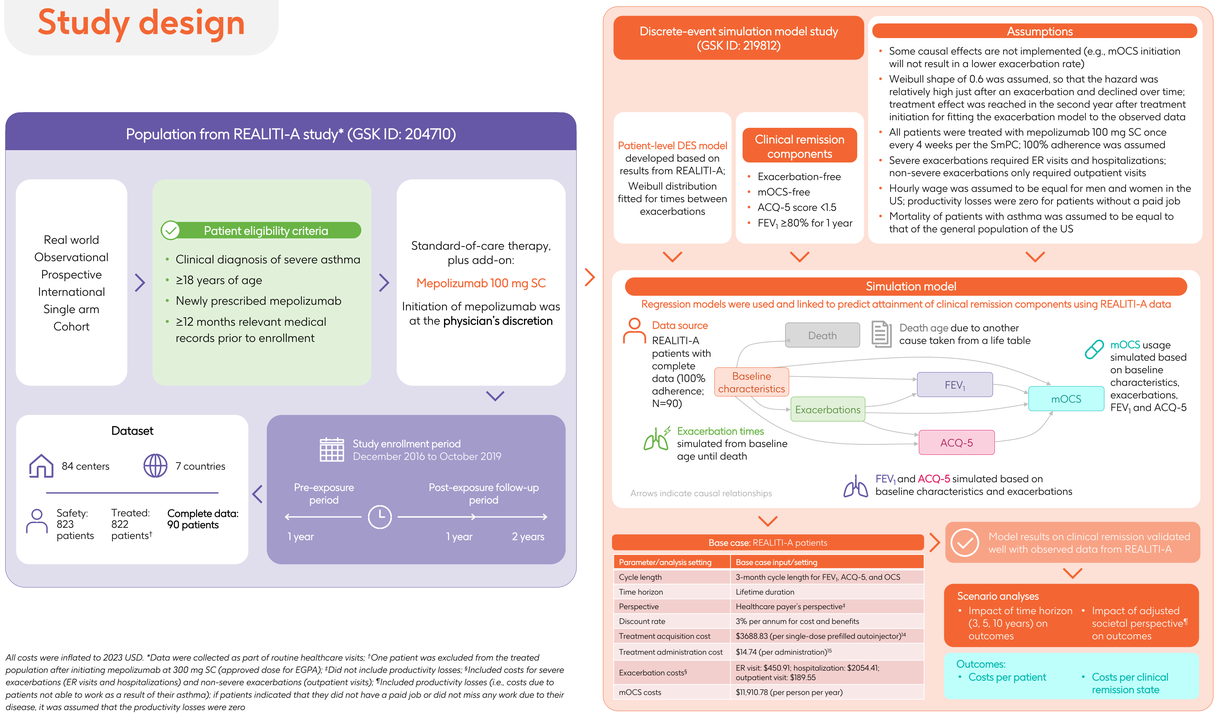
Background

- Clinical remission is an ambitious and achievable treatment goal for patients with asthma, partly due to the implementation of precision therapies including biologics[1–5]
- While definitions of clinical remission are still evolving, most include the following 4 components: absence of exacerbations, no use of OCS while on treatment, symptom control, and optimized/stabilized lung function[1–3, 6]
- Mepolizumab, a first-in-class humanized monoclonal antibody that specifically targets IL-5, is approved for the treatment of severe asthma with an eosinophilic phenotype.[7] It has demonstrated clinical benefits for patients in RCTs and in real-world studies[8–13]
- We developed an exploratory model to project long-term economic impacts of clinical remission attainment with mepolizumab

Aims

To describe the long-term economic impacts of clinical remission attainment in patients with severe asthma receiving mepolizumab using results from a discrete-event simulation model

Study design



*All costs were inflated to 2023 USD. *Data were collected as part of routine healthcare visits; †One patient was excluded from the treated population after initiating mepolizumab at 300 mg SC (approved dose for EGPA); ‡Did not include productivity losses; §Included costs for severe exacerbations (ER visits and hospitalizations) and non-severe exacerbations (outpatient visits); ¶Included productivity losses (i.e., costs due to patients not able to work as a result of their asthma); if patients indicated that they did not have a paid job or did not miss any work due to their disease, it was assumed that the productivity losses were zero*

Results

Figure 1: **In the base case, 29.5% and 35.2% of patients treated with mepolizumab achieved all 4 clinical remission components at Years 1 and 2, respectively, after which the proportion of patients in clinical remission stabilized**

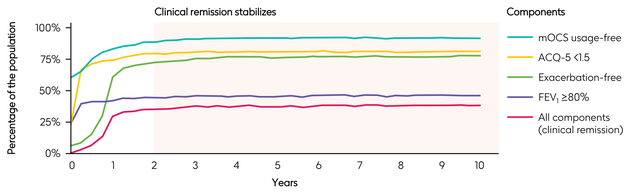


Figure 2: **In the base case, undiscounted costs per patient at Year 1 were 5% lower for patients in clinical remission versus patients not in remission when treatment costs were included, and 64% lower when treatment costs were excluded**

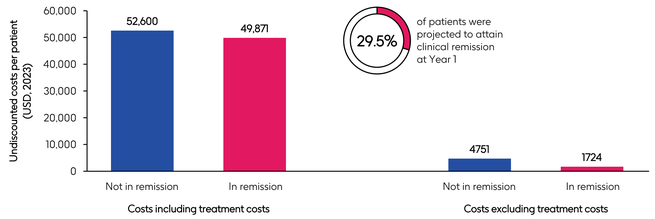
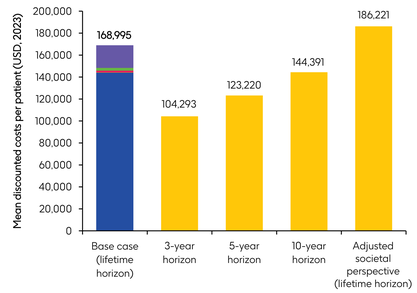


Figure 3: **For all patients (regardless of remission status), the mean discounted (3%) costs per patient treated with mepolizumab over a lifetime horizon were $168,995, driven by treatment acquisition and mOCS costs. In scenario analyses, shorter time horizons of 3, 5, and 10 years yielded lower mean discounted costs compared with the base case. The adjusted societal perspective resulted in higher mean discounted costs compared with the base case within a lifetime horizon**



Conclusions

This study modeled, for the first time, the impact of mepolizumab on clinical remission attainment in patients with severe asthma and predicted that economic benefits are associated with clinical remission

Total costs were lower for patients in clinical remission compared with patients who were not in remission at Year 1, regardless of whether treatment costs were included or excluded

- These findings are important considering the high overall economic burden demonstrated in severe asthma, particularly when adjusted societal perspectives are taken into consideration
- The 3-year time horizon yielded the lowest total costs compared with the base case; this is because patients had less time to accrue costs due to the short time horizon

Limitations of the model include that it assumed treatment effect was reached in the second year and as such that clinical remission stabilized after Year 2; however, there is some evidence to suggest that the rate of clinical remission increases over time[16,17]

More research is needed to validate the current study's findings and further utilize clinical remission for subsequent health-economic analysis

Abbreviations

ACQ-5, Asthma Control Questionnaire-5; DES, discrete-event simulation; ER, emergency room; EGPA, eosinophilic granulomatosis with polyangiitis; FEV_1, forced expiratory volume in 1 second; IL-5, interleukin-5; (m)OCS, (maintenance) oral corticosteroid; RCT, randomized controlled trial; SC, subcutaneous; SmPC, Summary of Product Characteristics; US, United States; USD, United States Dollar

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Disclosures

KB is an employee of GSK contracted through the Rutgers Health Outcomes, Policy, and Economic (HOPE) program, and does not hold any financial equities in GSK; **AM** and **RA-C** are employed by GSK and hold financial equities in GSK; **SNV** was a university worker employed by GSK at the time of the study; she is currently employed by Daiichi Sankyo; **ND**, **MK**, **DJ**, **MJHGS**, and **CB** are employees of OPEN Health, a consulting company which received payment from GSK to conduct this study.

Presenting author: Kejsi Begaj, kejsi.i.begaj@gsk.com