Systematic Review of Real-World Effectiveness and Safety Studies of Mepolizumab in Treating Severe Eosinophilic Asthma

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Aims

The anti–IL-5 monoclonal antibody, mepolizumab, is approved as an add-on therapy for patients with severe eosinophilic asthma in multiple regions worldwide.[1,2]

Mepolizumab reduces exacerbations and OCS dependence, and improves lung function, asthma control, and HRQoL in patients with severe eosinophilic asthma in RCTs.[3-6]

As real-world use of mepolizumab increases, the population of patients with access to mepolizumab is more diverse than those included in the mepolizumab RCTs.

The objective of this SLR was to examine the effectiveness of mepolizumab across real-world studies in asthma to understand to what extent the benefits of mepolizumab in RCTs translate into routine clinical practice.

Methods

Study design
GSK ID: 213095

Search strategy*
Embase, MEDLINE, MEDLINE In-Process via Ovid
Selected grey literature congress publications (2018–2020)

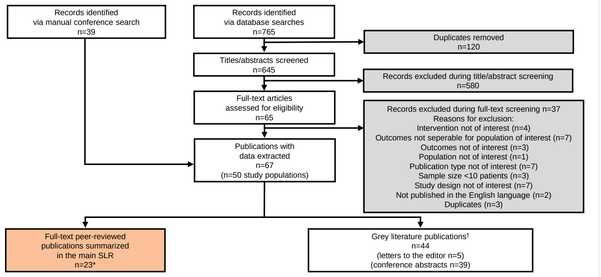
Eligible publications
Prior to July 10, 2020
Real-world, observational studies
≥10 patients, ≥6 years of age with asthma, treated with mepolizumab 100 mg SC

Screening
Titles/abstracts and then full-text publications were screened for inclusion by two independent investigators

Eligible outcomes
Exacerbations
OCS dependence
FEV_1
ACQ/ACT score
Safety

*This SLR was conducted according to the PRISMA guidelines.

Study attrition



*Results reported in this presentation focus on available evidence from 22 studies (reported in 23 full-text peer reviewed journal articles); †abstracts and letters to the editor (grey literature) were not included due to uncertainties on the quality of evidence.

- The study populations included a total of 2042 patients from Europe, Australia, the USA, Japan, Canada, Israel, and Turkey. Study durations ranged from 6 to 30 months, with most (17/22) studies based on retrospective design.

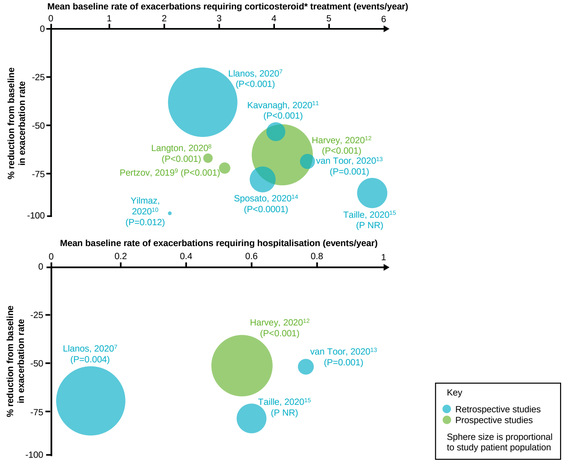
Results

Baseline demographics and characteristics

- Age: 48.6–67.1 years, n=2030†
- Maintenance OCS: 22–100%, n=1389
- Blood eosinophil counts: 580–1228 cells/µL, n=937†
- Exacerbation* rate: 2.1–5.9/year, n=1599†
- Nasal polyps: 22–100%, n=1708
- Allergic rhinitis/chronic rhinitis: 18–100%, n=1421
- Gastroesophageal reflux disease: 8–58%, n=901
- % predicted FEV_1: 50.2–86.5 n=1202
- FEV_1 (mL): 1400–2500 n=596
- ACT scores: 16.2–18.0 n=1019
- ACQ scores: 2.6–3.7 n=1069†

*If a study reported multiple exacerbation definitions, the value included in the range was for exacerbations requiring OCS or equivalent; †n values include studies where the mean and median data have been reported.

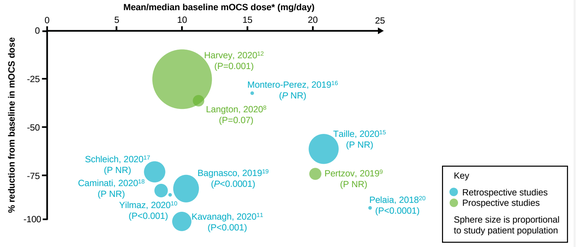
Mepolizumab reduced the frequency of exacerbations compared with baseline



*OCS/SCS treatment. Definitions of exacerbations varied across studies, including worsening asthma symptoms requiring emergency department or hospital visits, treatment with SCS, and/or increases in maintenance OCS doses. Six studies were excluded from the figure as they did not provide a definition for exacerbations, or did not specify OCS/SCS use.

- The mean percent reduction from baseline in exacerbation rates was 38.4–96.7% (median: 72.9%; n=15) following 12 months of mepolizumab treatment.

Mepolizumab reduced OCS dependence compared with baseline



*One study has been excluded from the graph as the data were stratified by blood eosinophil counts.

- In patients who were receiving mOCS at baseline, the mean/median percent reduction from baseline in daily mOCS dose ranged from -100.0% to -25.0% (median -75.0%, n=11 studies).

Mepolizumab improved lung function compared with baseline

- The percent change from baseline in FEV_1 %predicted was -2.3–8.1% following 6–12 months of mepolizumab treatment (median 5.3%, n=10 studies).
- Add-on mepolizumab treatment was associated with a mean change from baseline in FEV_1 of -30–400 mL at 6–12 months follow-up (median 270 mL, n=9 studies).

Mepolizumab improved symptoms compared with baseline

- The mean change from baseline in ACT and ACQ* scores ranged from 5.0 to 8.5 points (median: 6.2 points, n=10 studies) and -0.53 to -1.90 points (-1.13 points, n=7 studies), respectively.

*Three studies reported ACQ-5 scores, three studies reported ACQ-6 scores, and one study did not disclose the version of the ACQ used.

Safety

Data were available from ten studies (prospective, n=3; retrospective, n=7)

Treatment discontinuation due to AEs:
Prospective studies: 2–11% of patients (12 months of follow-up)
Retrospective studies: 0–6% of patients (6–24 months of follow-up)

Conclusions

- Patients treated with mepolizumab in real-world clinical practice generally had more severe disease, based on baseline mean exacerbation rates, blood eosinophil counts, maintenance OCS dose, and presence of comorbidities, than patients in mepolizumab RCTs.[3-6,21,22]
- Despite heterogeneity between studies and patients, consistent with RCTs,[3-6] mepolizumab-treated patients demonstrated reductions in exacerbation rates and maintenance OCS dependence, improvements in lung function and symptoms, and low rates of treatment discontinuation due to AEs.[22]
- Overall, the results from grey literature sources* were consistent with full-text peer-reviewed publications.
- Patients with severe asthma treated in real-world clinical practice demonstrate benefits with mepolizumab, consistent with results from mepolizumab RCTs.

*Grey literature included letters to the editor and congress abstracts.

Abbreviations
ACQ, Asthma Control Questionnaire; ACT, Asthma Control Test; AE, adverse events; FEV_1, forced expiratory volume in 1 second; HRQoL, health-related quality of life; IL-5, interleukin-5; mOCS, maintenance oral corticosteroid; NR, not reported; OCS, oral corticosteroid; RCT, randomized controlled trial; SC, subcutaneous; SCS, systemic corticosteroids; SLR, systematic literature review.

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