

Efficacy of Mepolizumab Stratified by Baseline Blood Eosinophil Count

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Aims

Mepolizumab is approved as an add-on maintenance treatment for patients with severe eosinophilic asthma.¹ Among these patients, it reduces blood eosinophil counts and the rate of clinically significant exacerbations, and improves lung function and health-related quality of life compared with placebo.²⁻⁵

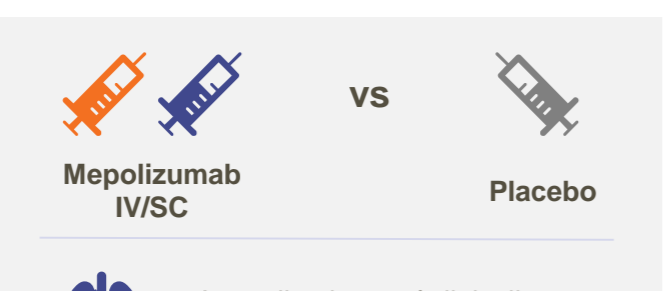
Evidence suggests that baseline blood eosinophil counts are predictive of response to mepolizumab treatment.²⁻⁶

Using data from the previous mepolizumab clinical trials, we performed a meta-analysis to assess the relationship between baseline eosinophil counts and mepolizumab efficacy in patients with severe eosinophilic asthma.

Methods

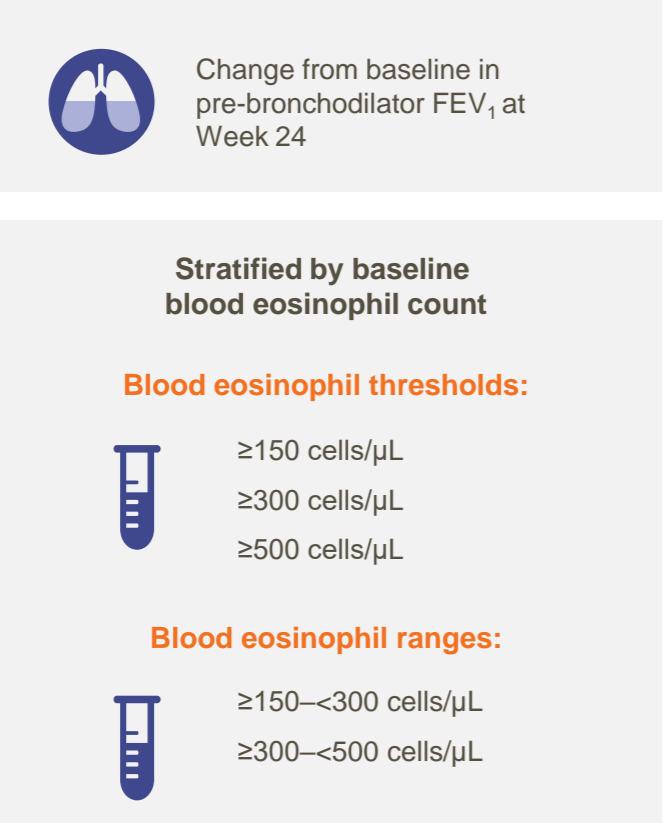
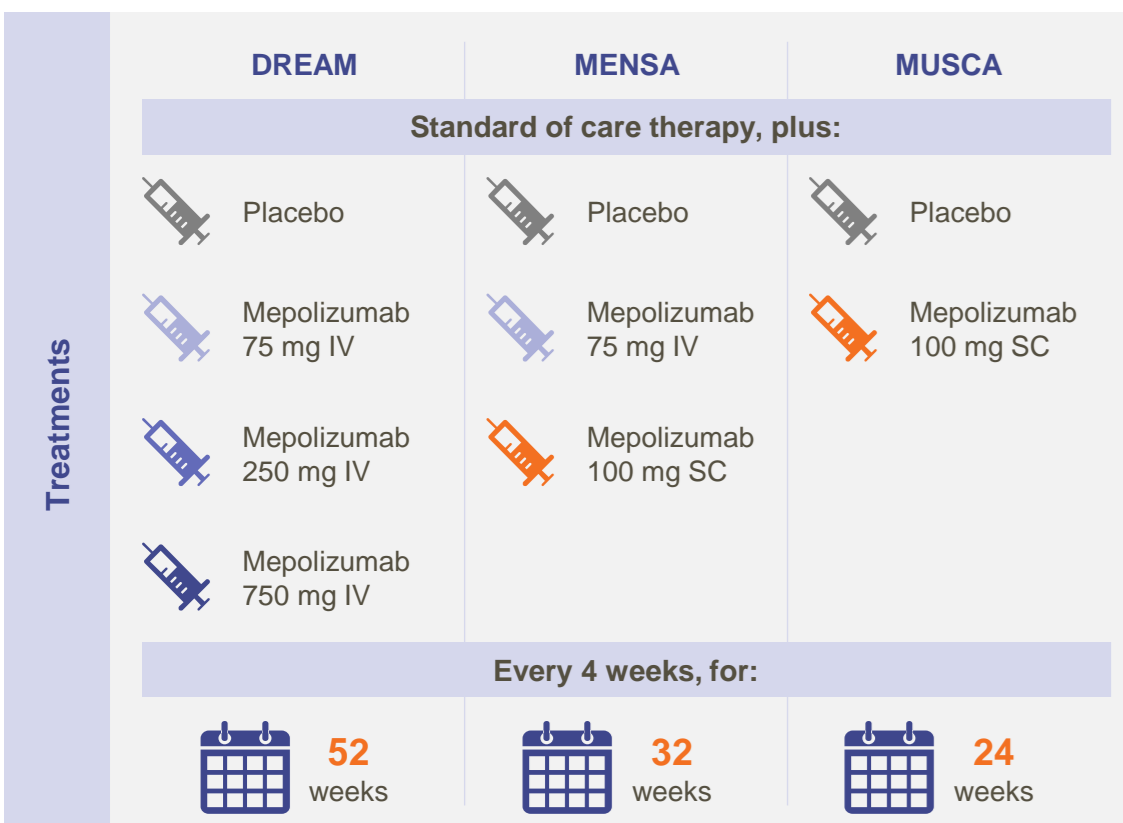
DREAM², MENSA³, & MUSCA⁴

Post hoc meta-analysis



Patients	Characteristics
616 (DREAM)	≥12 years of age
576 (MENSA)	Severe eosinophilic asthma: High-dose ICS plus ≥1 other controller therapy
551 (MUSCA)	≥2 exacerbations in previous year Eosinophilic inflammation

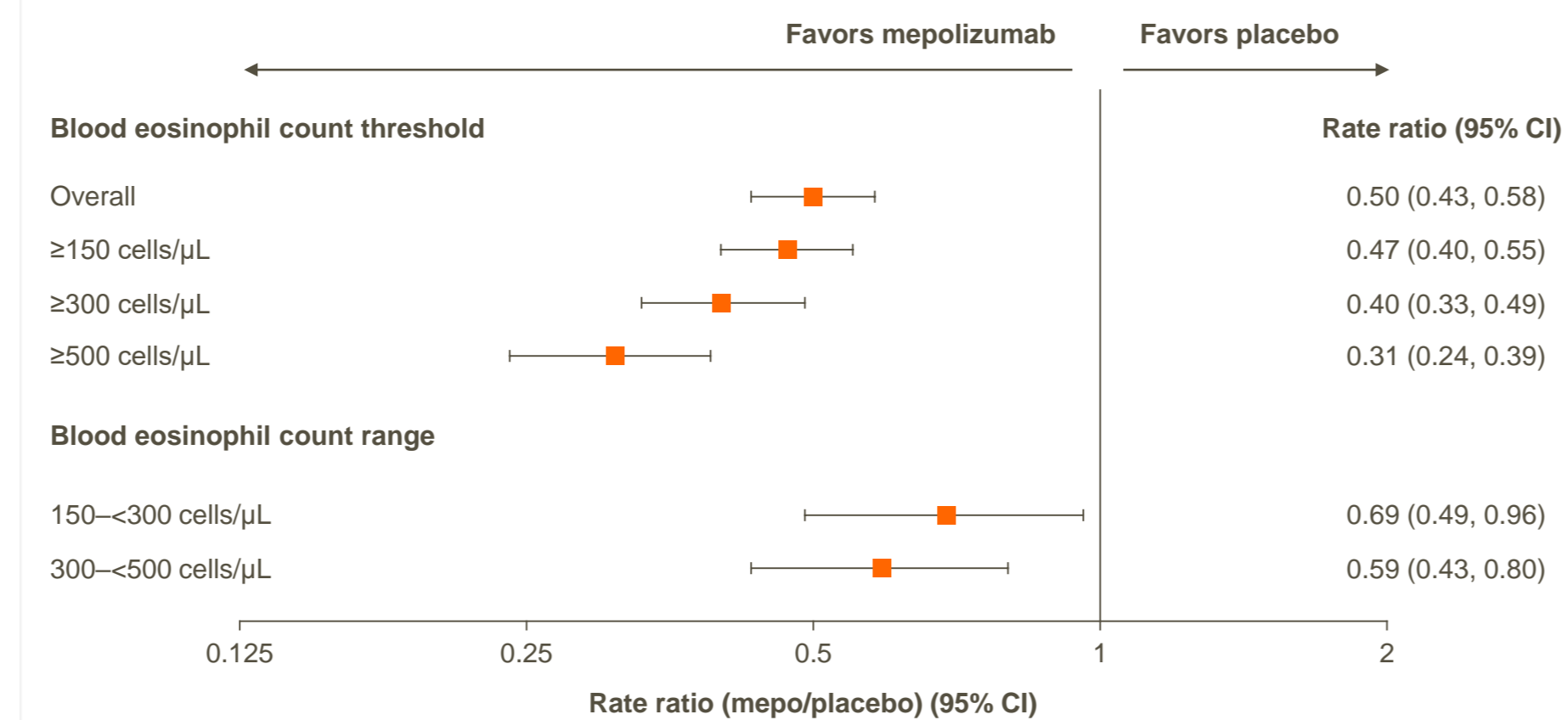
Endpoints	Measurements
Annualized rate of clinically significant exacerbations*	Rate ratio (mepo/placebo) (95% CI)
Change from baseline in SGRQ total score at study end	Difference (mepo vs placebo) (95% CI)
Change from baseline in ACQ-5 score at Week 24	Difference (mepo vs placebo) (95% CI)
Change from baseline in pre-bronchodilator FEV ₁ at Week 24	Difference (mepo vs placebo) (95% CI)



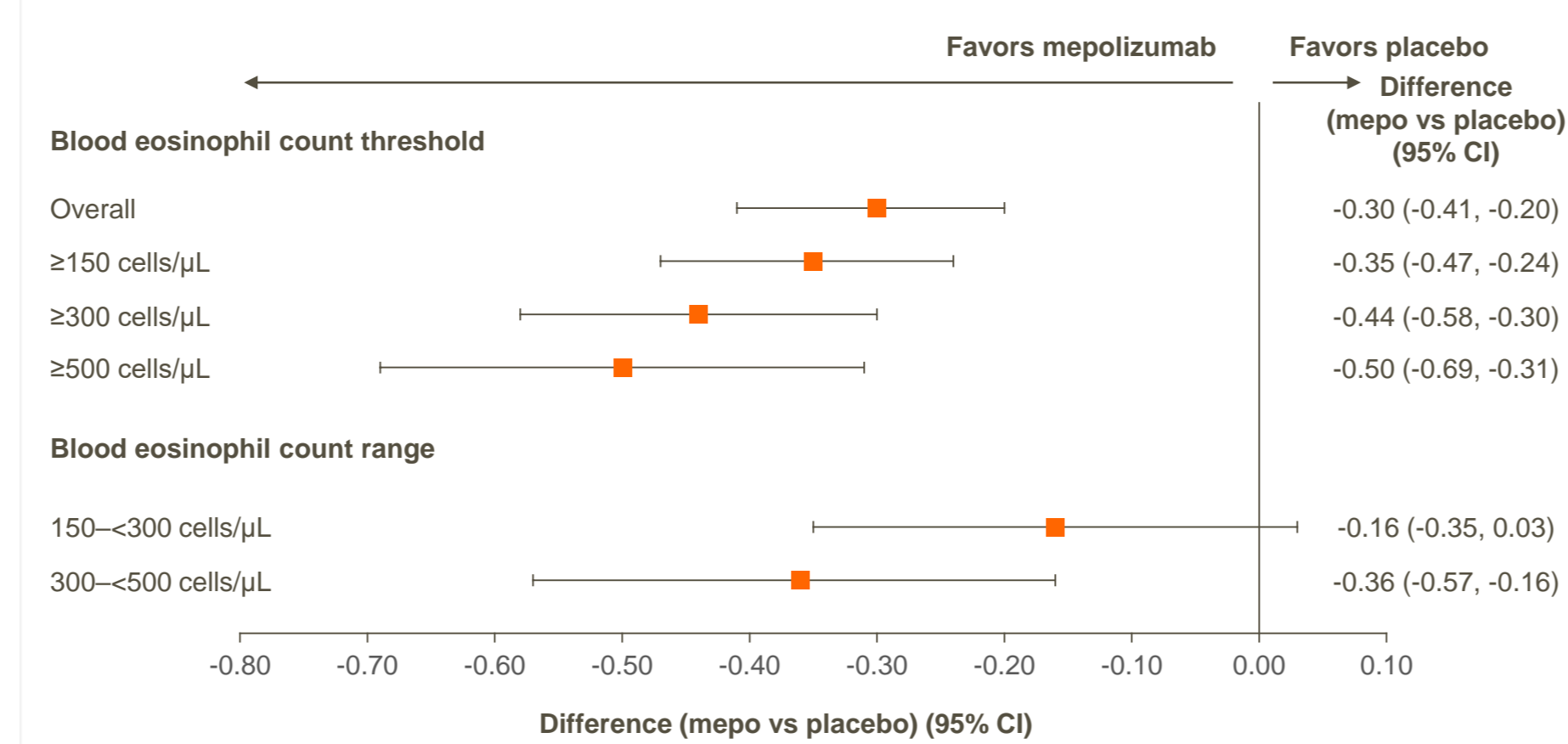
*Worsening of asthma requiring OCS or systemic corticosteroids for ≥3 days and/or hospitalization and/or an ER visit; †performed separately for each subgroup using a negative binomial regression model (exacerbations) or mixed model repeated measures (SGRQ, ACQ-5, FEV₁) with adjustment for covariates. Note: SGRQ not collected in DREAM study. ACQ-5, Asthma Control Questionnaire; ER, emergency room; FEV₁, forced expiratory volume in 1 second; ICS, inhaled corticosteroids; IV, intravenous; OCS, oral corticosteroids; SC, subcutaneous; SGRQ, St George's Respiratory Questionnaire

Results

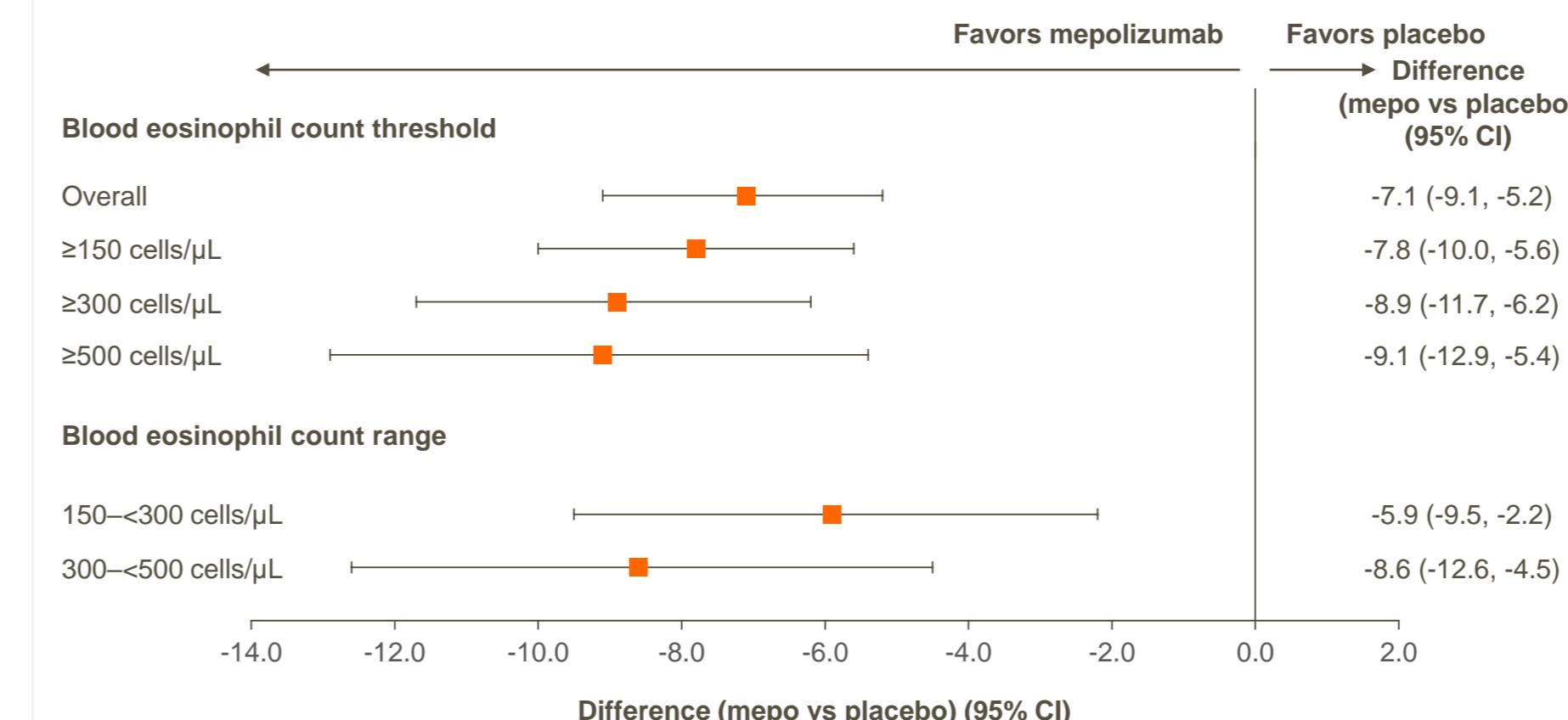
Patients receiving mepolizumab experienced fewer clinically significant exacerbations than those receiving placebo, with a trend towards greater improvements with increasing baseline blood eosinophil count



Mepolizumab was associated with an improvement from baseline at Week 24 in ACQ-5 score compared with placebo, with a trend towards greater improvements with increasing baseline blood eosinophil count

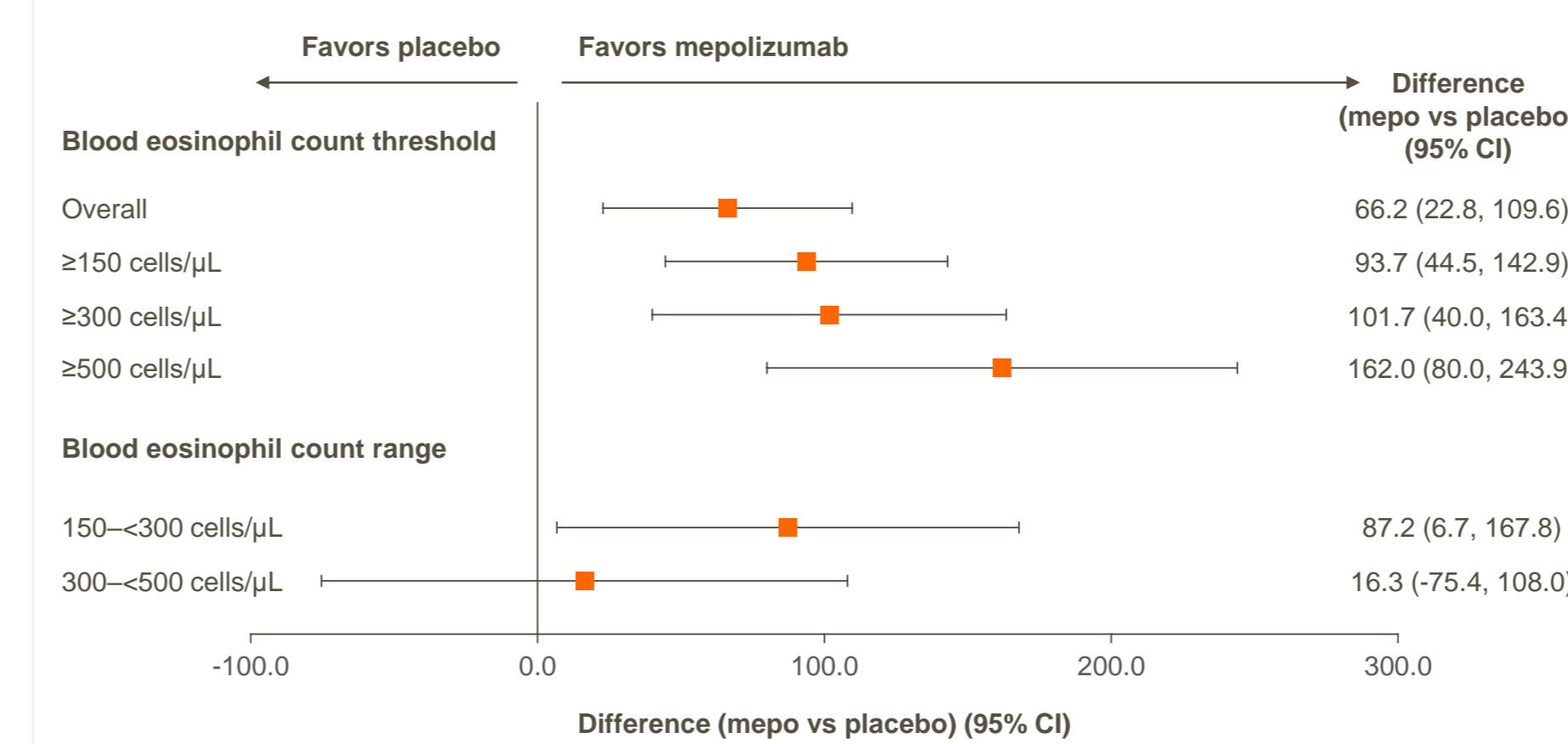


Mepolizumab was associated with an improvement from baseline at study end in SGRQ total score compared with placebo, with a trend towards greater improvements with increasing baseline blood eosinophil count



Note: SGRQ not collected in DREAM study.

Mepolizumab was associated with an improvement from baseline at Week 24 in FEV₁ compared with placebo, with a trend towards greater improvements with increasing baseline blood eosinophil count



Conclusions

- In this post hoc meta-analysis of the DREAM, MENSA, and MUSCA studies, clinically relevant reductions in exacerbation frequency, and improvements in SGRQ, ACQ-5, and lung function were seen with mepolizumab versus placebo across patient subgroups with differing baseline blood eosinophil counts.
- A positive relationship exists between baseline blood eosinophil count and the clinical efficacy of mepolizumab treatment.
- These data confirm the utility of the ≥150 cells/μL blood eosinophil count threshold for identifying patients with a consistent response to mepolizumab treatment.

Baseline demographics and clinical characteristics

	Placebo N=624	Mepolizumab (all doses) N=1119
Age, years	50 (13)	50 (13)
Female, n (%)	381 (61)	659 (59)
BMI, kg/m ²	28.0 (6.0)	28.2 (6.1)
Duration of asthma, years	19 (15)	20 (14)
Exacerbations in previous year, n (%)		
2	340 (54)	549 (49)
3	146 (23)	245 (22)
≥4	138 (22)	325 (29)
Receiving maintenance OCS therapy, n (%)	156 (25)	307 (27)
% predicted pre-bronchodilator FEV ₁	59.8 (16.6)	59.8 (16.8)
SGRQ total score	46.6 (19.3)	46.6 (18.9)
ACQ-5 score	2.3 (1.2)	2.2 (1.1)
Blood eosinophil count, cells/μL*	320 (0.94)	280 (0.96)
Blood eosinophil count, n (%)		
Thresholds: ≥150 cells/μL	515 (83)	863 (77)
≥300 cells/μL	359 (58)	573 (51)
≥500 cells/μL	211 (34)	330 (30)
Ranges: 150–<300 cells/μL	156 (25)	290 (26)
300–<500 cells/μL	148 (24)	243 (22)

*Values are presented as mean (SD) unless otherwise stated. *Data are presented as geometric mean (SD on log-transformed eosinophil count). Note: SGRQ not collected in DREAM study. BMI, body mass index; SD, standard deviation

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