corticosteroids and other controller(s) plus omalizumab were switched to mepolizumab. In this post hoc analysis of OSMO data we evaluated mepolizumab treatment response, by weight and body mass index (BMI).

Methods: In the multicenter, open-label, single-arm OSMO study (NCT02654145), patients with uncontrolled SEA who had used omalizumab ≥4 months were switched directly to 4-weekly subcutaneous mepolizumab 100 mg for 32 weeks. In this analysis, changes from baseline to Week 32 in Asthma Control Questionnaire (ACQ-5) score, St George's Respiratory Questionnaire (SGRQ) total score, pre-bronchodilator forced expiratory volume in 1 second (FEV_1), and exacerbation rates were assessed, by weight (<70, ≥70–<80, ≥80–<95, ≥95 kg) and BMI (<25, ≥25–<30, ≥30–<35, ≥35 kg/m^2) quartiles.

Results: At Week 32, patients (n=145 [intent-to-treat population]; mean age: 53.6 years; 59% females), showed marked improvements from baseline in mean ACQ-5 score (range -1.17,1.69; minimal clinically important difference [MCID] 0.5), SGRQ total score (range -11.9, -23.1; MCID 4) and exacerbation rate (treatment/pre-treatment rate ratio range 0.23,0.56), irrespective of baseline weight or BMI. Mean improvements in pre-bronchodilator FEV_1 varied across weight and BMI quartiles (range -51, 316 and -66, 270 mL, respectively; MCID 100 mL), with the smallest changes in the <70 kg and <25 kg/m^2 quartiles.

Conclusion: Weight and BMI did not affect mepolizumab response in terms of asthma control, health status, and exacerbation rates in patients with SEA previously uncontrolled with omalizumab.

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CAPTAIN STUDY: EFFECTS OF FLUTICASONE FUROATE/UMECLIDINIUM/VILANTEROL ON FEV1 IMPROVEMENT IN ASTHMA ACCORDING TO AGE

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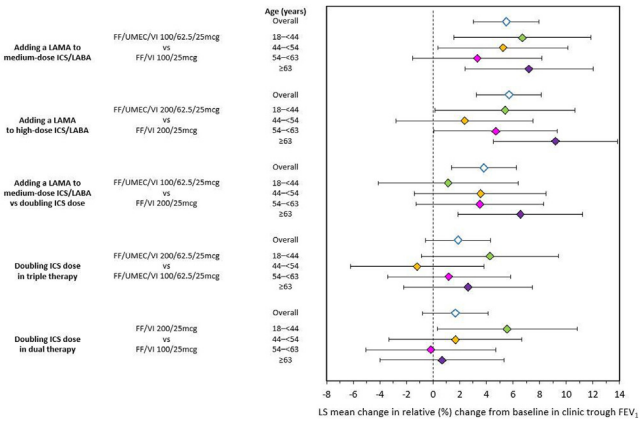
Introduction: Patients with asthma uncontrolled on inhaled corticosteroid/long-acting β_2-agonist (ICS/LABA) may benefit from increasing ICS dose and/or adding a long-acting muscarinic antagonist (LAMA). Here, we extend previous CAPTAIN study analyses (which showed that adding umeclidinium [UMEC] to fluticasone furoate/vilanterol [FF/VI] improved FEV_1 in both patients <65 and ≥65 years) by evaluating relative lung function responses in additional age groups.

Methods: This Phase IIIA, randomized, double-blind, 24–52-week, parallel-group study randomized adults (no upper age limit) with uncontrolled asthma despite ICS/LABA therapy. Treatment: once-daily FF/VI (100/25, 200/25mcg) or FF/UMEC/VI (100/31.25/25, 100/62.5/25, 200/31.25/25, 200/62.5/25mcg) via a single dry-powder inhaler. Endpoints reported: relative percentage change from baseline in trough FEV_1 (Week 24) in four age groups (25th, 50th and 75th percentiles used to define cut points; G1: 18–<44; G2: 44–<54; G3: 54–<63; G4: ≥63 years) (post-hoc analysis).

Results: Addition of UMEC was associated with improved trough FEV_1 regardless of age group (Figure). In comparison, increasing ICS dose was not associated with the same magnitude of improvements as adding UMEC, particularly in patients ≥63 years. There was a suggestion for better outcomes in younger (G1) versus older (G2-4) patients with improvements of 5.57% (95%CI: 0.32, 10.83) in G1, from doubling FF dose in FF/VI (Figure).

Conclusions: Adding UMEC to FF/VI was associated with lung function improvements regardless of age; these improvements were markedly more pronounced than doubling FF for patients ≥63 years. Effects of increasing FF dose were less consistent.



Data were not adjusted for multiplicity. Number of patients in the overall, 18–<44, 44–<54, 54–<63 and ≥63 age groups respectively: FF/UMEC/VI 100/62.5/25mcg: 406, 90, 106, 107, 103; FF/UMEC/VI 200/62.5/25mcg: 408, 92, 90, 122, 104; FF/VI 100/25mcg: 407, 93, 102, 103, 109; FF/VI 200/25mcg: 406, 88, 94, 104, 120. Number of patients with analyzable data at Week 24 in the overall, 18–<44, 44–<54, 54–<63 and ≥63 age groups, respectively: FF/UMEC/VI 100/62.5/25mcg: 390, 88, 99, 104, 99; FF/UMEC/VI 200/62.5/2mcg: 391, 87, 85, 118, 101; FF/VI 100/25mcg: 379, 89, 95, 93, 102; FF/VI 200/25mcg: 385, 80, 91, 101, 113. CI, confidence interval; ICS, inhaled corticosteroid; FEV_1, forced expiratory volume in 1 second; FF, fluticasone furoate; LAMA, long-acting muscarinic antagonist; LS, least squares; UMEC, umeclidinium; VI, vilanterol.

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REPRODUCIBILITY OF THE EARLY ASTHMATIC RESPONSE AMONG CAT-ALLERGIC MILD ASTHMATICS IN A NATURALISTIC EXPOSURE CHAMBER

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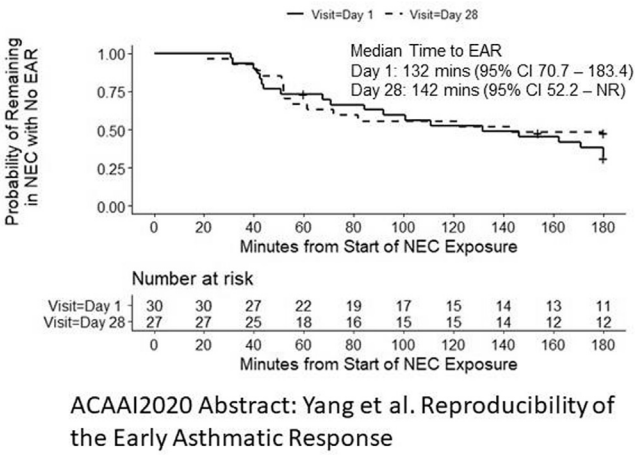
Introduction: We evaluated the proportion of cat-allergic mild asthmatics who experience an early asthmatic response (EAR) during cat allergen exposure in a Naturalistic Exposure Chamber (NEC) and the reproducibility of the EAR.

Methods: In this prospective, observational study, 30 confirmed cat-allergic mild asthmatics (GINA-1; 43% male, mean age 32 years) underwent two (Day 1 and 28) up to 180-minute cat allergen challenges in a NEC. EAR was defined as a ≥20% reduction from baseline in forced expiratory volume in 1 s (FEV_1) or symptoms prompting the subject to leave the NEC.

Results: 44% of subjects had an EAR at both NEC exposures; 67% of subjects at Day 1 and 52% of subjects at Day 28, with similar mean



CI, confidence interval; EAR, early asthma response; NR, Not reached; + indicates censoring, i.e. subject exited NEC without experiencing an EAR; subjects' time to EAR is censored at 180 minutes if they remained in the NEC for the maximum time without experiencing an EAR.

time in NEC (119 minutes Days 1 and 28) and median time to EAR (Figure). Late asthmatic response was observed in 33% of subjects following either exposure. The Fel d 1 concentration in NEC was variable and time to EAR was significantly associated with Fel d 1 concentration ($p < 0.0001$ on Days 1 and 28, Cox Proportional Hazards Model). Average FEV_1 was highly correlated within subjects between the two NEC exposures ($r=0.92$, $p<0.0001$). NEC exposure was generally well-tolerated; all provoked asthma exacerbations were mild and resolved with Salbutamol.

Conclusions: Provocation of early asthma exacerbations with cat allergen in a NEC is highly reproducible when assessed by average FEV_1, but moderately reproducible when assessed by occurrence or time to EAR. NEC is a promising model for development of cat-specific allergy and asthma therapeutics.

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COMPREHENSIVE RESPONSE TO BENRALIZUMAB BY PATIENTS WITH NASAL POLYPOSIS AND SEVERE, EOSINOPHILIC ASTHMA

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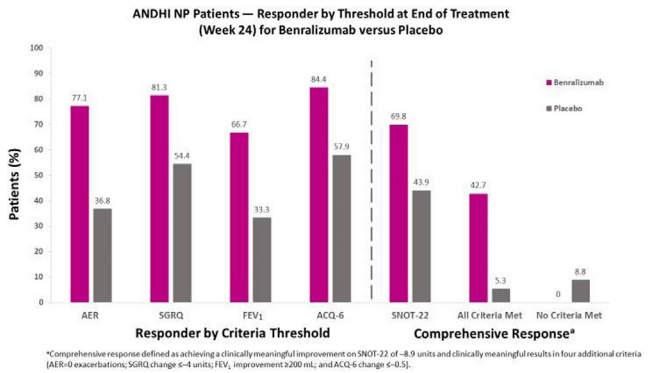
Introduction: A *post-hoc* subanalysis was conducted of the Phase IIIb ANDHI trial to assess comprehensive response to benralizumab based on nasal polyposis (NP) and asthma measures.

Methods: Adults with severe, eosinophilic asthma were randomized to benralizumab or placebo for 24 weeks, and those with physician-diagnosed NP ongoing at baseline were included in this subanalysis. Comprehensive response was defined as achieving a clinically meaningful improvement in the Sino-Nasal Outcome Test-22 (SNOT-22) of −8.9 units and clinically meaningful results for four additional criteria (asthma exacerbation rate [AER]; 0 exacerbations), St. George's Respiratory Questionnaire [SGRQ; change ≤−4 units], FEV_1 [improvement ≥200 mL], and Asthma Control Questionnaire 6 [ACQ-6; change ≤−0.5]).

Results: At baseline, patients (n=96 benralizumab; n=57 placebo) had a mean age=53 years, median peripheral blood eosinophil count=510 cells/μL, mean prior-year AER=3.3, mean pre-bronchodilator FEV_1=55% predicted, mean SNOT-22=50.2, mean SGRQ total score=53.1, and mean ACQ-6=2.9. Percentage of patients with clinically meaningful improvements in SNOT-22 at end of treatment (Week 24) was greater for benralizumab (69.8%) vs. placebo (43.9%). At Week 24, comprehensive responders were more common with benralizumab (42.7%) vs. placebo (5.3%). Percentages of comprehensive responders increased for patients who met 3, 2, or 1 additional criteria (up to 53.1% vs. 12.3%, 60.4%, vs 24.6%, and 64.6% vs 29.8% for benralizumab and placebo, respectively).

Conclusion: The majority of patients with asthma and NP treated with benralizumab were SNOT-22 responders, and most were comprehensive responders, achieving clinically meaningful improvement in SNOT-22 with multiple asthma outcomes (exacerbations, HRQOL, lung function, or asthma control).

[a]Comprehensive response defined as achieving a clinically meaningful improvement on SNOT-22 of −8.9 units and clinically meaningful results in four additional criteria (AER=0 exacerbations; SGRQ change ≤−4 units; FEV1 improvement ≥200 mL; and ACQ-6 change ≤−0.5).



ACQ=Asthma Control Questionnaire; AER=Asthma Exacerbation Rate; FEV1=forced expiratory volume in 1 second; SGRQ=St. George's Respiratory Questionnaire; SNOT=Sino-Nasal Outcome Test.

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CLINICAL BURDEN OF SEVERE ASTHMA TREATED WITH BIOLOGICS

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Introduction: Patients with severe asthma may remain uncontrolled despite being on biologic therapy in addition to standard therapy, but this disease burden has not been quantified in a US national sample.

Methods: Severe asthma patients with prevalent biologic treatment indicated for asthma (anti-IgE and non-anti-IgE; earliest use =index date) were selected from the MarketScan database between 1/1/2013-6/30/2018. Inclusion criteria: continuous enrollment for 12 months post-index with minimum of 2 biologic fills, ≥12 years of age on index, evidence of medium-to-high dose inhaled corticosteroid/long-acting beta agonist (ICS/LABA) combination prior to index, and absence of other respiratory diagnoses and malignancies. Outcomes (described in Table 1) were reported during the 12-month post-index period.

Results: The sample included 3,262 biologic patients; 88% with anti-IgE therapy (omalizumab) and 12% non-anti-IgE (reslizumab, mepolizumab, benralizumab). The mean age was 49 (+/-15) years; 64% female. Allergic rhinitis (74%) was a common comorbidity. Prescriptions observed included leukotriene receptor antagonists (68%), corticosteroids (76%), and ICS/LABA (82%). 63% of patients had an asthma exacerbation; the mean number was 1.4 (+/-1.5). 34% of patients were categorized as presenting "controlled" asthma, 33% uncontrolled, and 32% sub-optimally controlled (Table 1). 67% of patients persisted with biologics for 12 months (absence of 90-day gap); mean time to discontinuation was 187 (+/-92) days. Results were similar for patients receiving anti-IgE and non-anti-IgE biologics.

[1] Disease exacerbations and threshold of disease control were measured during the 12-month post-index period excluding the first 30 days.