Efficacy of Dupilumab in Patients Hospitalized due to Chronic Obstructive Pulmonary Disease Exacerbation: Phase 4 MISSION Trial Design

SA80

COPD

Full poster download
Copies of the presentation obtained through the QR code are for personal reference only

Sanjay Ramakrishnan[1,2,3], Shawn D. Aaron[4], Surya P. Bhatt[5], Christopher E. Brightling[6], Wim Janssens[7], Frits M. E. Franssen[8,9], Mona Bafadhel[10], Amy J. Pitts[11], Changming Xia[11], Michel Djandji[12], Michael Zhang[11], Mena Soliman[11], Gerard J. Criner[13]

[1]Institute for Respiratory Health, University of Western Australia, Perth, WA, Australia; [2]Sir Charles Gairdner Hospital, Perth, WA, Australia; [3]UWA Medical School, University of Western Australia, Perth, WA, Australia; [4]The Ottawa Hospital, University of Ottawa, ON, Canada; [5]University of Alabama at Birmingham, Birmingham, AL, USA; [6]University of Leicester, Leicester, UK; [7]University Hospitals Leuven, Leuven, Belgium; [8]Maastricht University Medical Center, Maastricht, Netherlands; [9]CIRO, Horn, Netherlands; [10]King's Centre for Lung Health, King's College London, London, UK; [11]Regeneron Pharmaceuticals Inc., Tarrytown, NY, USA; [12]Sanofi, Cambridge, MA, USA; [13]Thoracic Medicine and Surgery, Lewis Katz School of Medicine at Temple University, Philadelphia, PA, USA

Conclusion

MISSION will collect evidence on whether add-on dupilumab can reduce hospital readmission and exacerbation rates following hospitalization due to a severe exacerbation; the findings may help guide treatment decisions and improve outcomes in patients with COPD and type 2 inflammation

Objective

The phase 4 MISSION study will evaluate whether dupilumab can reduce hospital readmissions and exacerbations in patients hospitalized due to COPD exacerbation with type 2 inflammation

Background

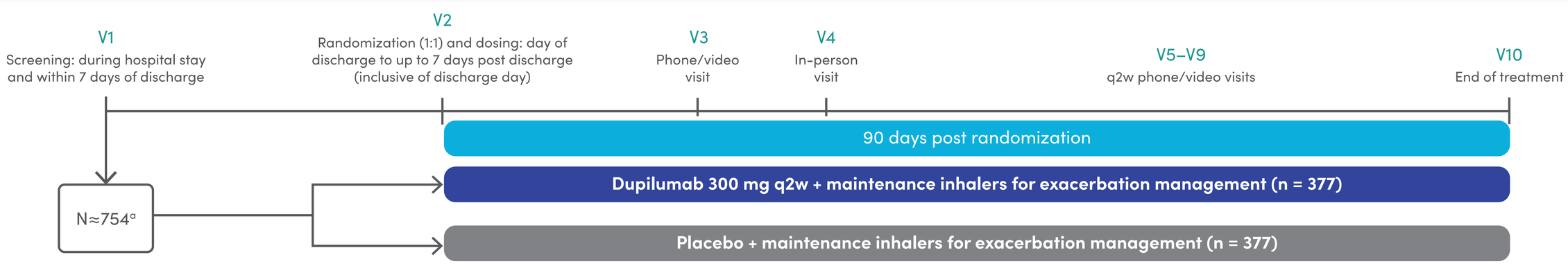
- Patients who are hospitalized due to COPD exacerbations have an increased risk of hospital readmission and mortality[1]
- Patients with COPD and type 2 inflammation, often defined as a blood eosinophil count of ≥300 cells/µL, have an increased risk of hospital readmission compared with patients without type 2 inflammation[2]
- A pooled analysis of the phase 3 BOREAS and NOTUS trials demonstrated that dupilumab reduces moderate or severe exacerbations and improves lung function, disease symptoms, and QoL in patients with COPD and type 2 inflammation[3]

Methods

- MISSION, a phase 4, randomized, double-blind, placebo-controlled, multinational study (NCT07587658) will enroll patients (aged ≥40 years) hospitalized due to a COPD exacerbation
- MISSION is an event-driven trial; enrollment continues until the required number of readmission events is reached
- Patients will be randomized to add-on dupilumab 300 mg q2w or matching placebo for 90 days in addition to standard-of-care treatment

Results

Study design of the phase 4 MISSION clinical trial



[a]MISSION is an event-driven trial; enrollment continues until the required number of readmission events is reached.

Key patient eligibility criteria

Inclusion criteria

- **≥40 years of age**
- **Clinical diagnosis of COPD** and meeting the following criteria:
  - **Current or former smoker**[a] with a smoking history of ≥10 pack-years
  - **Post-bronchodilator FEV_1/FVC ratio** of **<0.7** from the most recent spirometry results within the last 3 years
  - **Hospitalized or admitted to the ED for >24 hours for acute exacerbation**
  - Blood eosinophil count of **≥300 cells/µL** during the **exacerbation event**[b]
  - **Received triple inhaled therapy (ICS/LABA/LAMA)** or **dual** if **ICS contraindicated (LABA/LAMA)** prior to hospital admission
  - Chronic use of **roflumilast** or **azithromycin** or **ensifentrine** is allowed if the patient is on a **stable dose** for the treatment of COPD for **>1 month**

Exclusion criteria

- **Clinical evidence of pneumonia** as the primary cause of admission or acquired during hospital stay
- **Complicating pulmonary conditions** during the 8 weeks prior to randomization
- **Clinically significant pulmonary diseases** other than COPD:
  - Patients with **clinically significant α-1 antitrypsin deficiency**
  - **Clinical evidence of lung disease(s)** other than COPD on imaging (chest X-ray, or CT) with significant findings within 12 months of screening
  - Evidence of **active** or **latent tuberculosis** as documented by medical history and examination
- **Cardiac-related comorbidity**[c] within 3 months prior to screening, and during the screening period up to, and/or during randomization
- **O_2 Treatment with invasive mechanical ventilation in-hospital during the index event**
- **Long-term treatment with oxygen >4.0 L/min**
- Any **biologic therapy** or **biologic investigational medicinal product** to treat **type 2 inflammatory diseases within 6 months** prior to the screening visit
- Patients receiving dialysis therapy

[a]Former smokers are defined as those participants who were active smokers with ≥10 pack-years of smoking and who have stopped smoking for at least 6 months prior to V1. [b]The exacerbation event starts from the day when systemic corticosteroids ± antibiotics are first administered continuously up to the day when the patient presents to ED/hospital. [c]Congestive heart failure NYHA Class III/IV, active or recent myocardial infarction, angina not well-controlled by medication, unstable ventricular arrhythmias, history of life-threatening arrhythmias, hypertensive crisis during index admission.

Summary of primary and secondary endpoints

Primary objectives[a]	Primary endpoints[a]
To evaluate the efficacy of dupilumab in reducing risk of all-cause non-elective hospital readmissions, ED visits, or deaths	Time to all-cause non-elective hospital readmissions, ED visits, or deaths through Day 90
To evaluate the efficacy of dupilumab in reducing the number of moderate and/or severe COPD exacerbations	Number of moderate and/or severe COPD exacerbations through Day 90
Secondary objectives	**Secondary endpoints**
To evaluate the efficacy of dupilumab in reducing risk of COPD-related hospital readmissions, ED visits, or deaths	Time to first COPD-related hospital readmission, ED visit, or death through Day 90
To evaluate the effect of dupilumab on time to first moderate and/or severe COPD exacerbation	Time to first moderate and/or severe COPD exacerbation through Day 90
To evaluate the efficacy of dupilumab in reducing all-cause non-elective hospital readmissions, ED visits, or deaths	Number of all-cause non-elective hospital readmissions through Day 90 Number of ED visits through Day 90 Number of COPD-related hospital readmissions through Day 90
To evaluate the efficacy of dupilumab in reducing COPD-related hospital readmissions, ED visits, or deaths	Number of COPD-related ED visits through Day 90 Number of all-cause deaths through Day 90 Number of COPD-related deaths through Day 90
To evaluate the efficacy of dupilumab in reducing all-cause non-elective hospital readmissions or ED visits or deaths by Day 30 or 60	Occurrence of all-cause non-elective hospital readmissions, or ED visits, or deaths by Day 30 or 60
To evaluate the efficacy of dupilumab in reducing COPD-related hospital readmissions or ED visits or deaths by Day 30 or 60	Occurrence of COPD-related hospital readmissions, ED visits, or deaths by Day 30 or 60
To evaluate the effect of dupilumab on patient-reported outcomes	Change from baseline in CAAT score at Week 3, 5, 9, and end of treatment Change from baseline in EXACT questionnaire score at Week 3, 5, 9, and end of treatment
To evaluate the safety and tolerability of treatment	Occurrence of treatment-emergent AEs and SAEs from baseline through the last study visit

[a]The two primary endpoints are not co-primary; the study is considered successful if either one is met.

AEs, adverse events; CAAT, Chronic Airways Assessment Test; COPD, chronic obstructive pulmonary disease; CT, computed tomography; ED, emergency department; EXACT, EXAcerbation of Chronic Pulmonary Disease Tool; FEV_1, forced expiratory volume in 1 second; FVC, forced vital capacity; ICS, inhaled corticosteroid(s); LABA, long-acting β2 agonist(s); LAMA, long-acting muscarinic antagonist(s); q2w, every 2 weeks; SAEs, serious adverse events; V, visit.

References: 1. Whittaker H, et al. Int J Chron Obstruct Pulmon Dis. 2022;3:427–37. 2. Hegewald MJ, et al. Int J Chron Obstruct Pulmon Dis. 2020;15:2629–41. 3. Bhatt SP, et al. Lancet Respir Med. 2025;13:234–43.

Acknowledgments and funding sources: The authors would like to thank Gaëlle Bégo-Le-Bagousse (Sanofi, Gentilly, France) for presenting this poster on behalf of the authors. The authors also thank Cong Zhi, Danen Cunoosamy, and Isabelle Malbouisson for their contributions to the study. Research sponsored by Sanofi and Regeneron Pharmaceuticals Inc. ClinicalTrials.gov Identifier: NCT07587658. A portion of the results presented at ISPOR-EU 2026 have also been presented at EPC 2026. Medical writing support, under the direction of the authors, was provided by Karl Harber, PhD, employee of the Publications and Medical Affairs Division of Omnicom Health Medical Communications, funded by Sanofi and Regeneron Pharmaceuticals Inc. in accordance with the Good Publication Practice (GPP 2022) guidelines.

Disclosures: Ramakrishnan S: Charlies Foundation for Research, National Institute for Health and Care Research – salary support; AstraZeneca, Chiesi, GSK, Sanofi – speaker fees; AstraZeneca, Boehringer Ingelheim, Chiesi – conference travel support; AstraZeneca, GSK, Sanofi – advisory board attendance; Connect Biopharma – consulting fees. **Aaron SD:** AZ, GSK, Methapharm, Sanofi – advisory board attendance. **Bhatt SP:** The author is supported by NIH grants R01HL151421 and UH3HL155806. Apreo, AstraZeneca, Boehringer Ingelheim, Chiesi, Connect Biopharma, Genentech, GSK, Kymera, Merck, Polarean, Regeneron Pharmaceuticals Inc., Sanofi, Uniquity, Verona – advisory boards or consultant; Horizon CME, illuminate.health, Integritas Communications, Integrity CE, Medscape – honoraria; Apreo, AstraZeneca, Connect Biopharma, COPD Foundation, Genentech, Nuvaira, Sanofi, Uniquity – funds paid to institute for research. **Brightling CE:** AirPROM, Medical Research Council UK, National Institute for Health Research UK – grants; 4D pharma, AstraZeneca/MedImmune, Boehringer Ingelheim, Chiesi, GSK, Gossamer Bio, Mologic, Novartis, Roche/Genentech, Sanofi/Regeneron Pharmaceuticals Inc. – grants and personal fees; Gilead, Pfizer, PrEP Biopharm, Teva, Theravance Biopharma, Vectura – personal fees. **Janssens W:** AstraZeneca, Chiesi, GSK, Roche – consultant, institutional grants, speaker fees. **Franssen FME:** AstraZeneca, Boehringer Ingelheim, Chiesi, MSD, Novartis – honoraria for presentations, speaker bureaus, manuscript writing or educational events; GSK – consulting fees; AstraZeneca – grant support (to institution). **Bafadhel M:** Research Professor NIHR304263, is funded by the National Institute for Health and Care Research (NIHR). The views expressed in this publication are those of the author(s) and not necessarily those of the NIHR, NHS, or the UK Department of Health and Social Care. AstraZeneca, Roche – consultancy and speaker honoraria (to institution); Asthma + Lung UK, AstraZeneca, EU Horizon, NIHR – grant funding (to institution); Albus Health – scientific advisor. **Pitts AJ, Xia C, Zhang M, Soliman M:** Regeneron Pharmaceuticals Inc. – employees and shareholders. **Djandji M:** Sanofi – employee, may hold stock and/or stock options in the company. **Criner GJ:** Almirall, AstraZeneca, Boehringer Ingelheim, Chiesi, CSA Medical, Eolo, GSK, HGE Technologies, Novartis, Nuvaira, Olympus, Pulmonx, Verona – personal fees.

Presented at the 29th Annual European Congress of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR Europe) 2026; Vienna, Austria; November 8–11, 2026.