ClinicalTrials.gov PRS
Protocol Registration and Results System

ID: EP-101-01 Assessment of the Safety and Ability of a Once-a-day Dose of an Orally Inhaled Medicine [ie, Glycopyrrolate Inhalation Solution = GIS] to Improve Airflow in the Lungs When Delivered With an Electronic eFlow Nebulizer System in Patients With Chronic Obstructive Pulmonary Disease (COPD) NCT02951312

Protocol Registration and Results Preview

Assessment of the Safety and Ability of a Once-a-day Dose of an Orally Inhaled Medicine [ie, Glycopyrrolate Inhalation Solution = GIS] to Improve Airflow in the Lungs When Delivered With an Electronic eFlow Nebulizer System in Patients With Chronic Obstructive Pulmonary Disease (COPD)

This study has been completed.

Sponsor:
Sunovion Respiratory Development Inc.

Information provided by (Responsible Party):
Sunovion Respiratory Development Inc.

ClinicalTrials.gov Identifier:
NCT02951312

First received: October 26, 2016
Last updated: May 5, 2017
Last verified: October 2016

Purpose

The study assessed the safety and ability of several doses of an orally inhaled medicine [ie, Glycopyrrolate Inhalation Solution = GIS] to improve airflow in the lungs when delivered with an electronic eFlow nebulizer system in patients with Chronic Obstructive Pulmonary Disease (COPD). The study was conducted in 12 patients in 2 parts. Part 1 was designed to find the once-a- day GIS dose that produced the highest improvement in lung airflow. Part 2 tested the GIS dose with the highest improvement in lung airflow and a placebo (ie, no drug) delivered by a general purpose nebulizer. The airflow improvements of the same GIS dose were compared between the two nebulizer systems to determine what effect the device had on GIS delivery.

Condition	Intervention	Phase
Chronic Obstructive Pulmonary Disease	Drug: Glycopyrrolate Inhalation Solution 25mg Drug: Glycopyrrolate Inhalation Solution 75mg Drug: Glycopyrrolate Inhalation Solution 200mg Drug: Glycopyrrolate Inhalation Solution 200mg Jet Drug: Glycopyrrolate Inhalation Solution 500mg Drug: Glycopyrrolate Inhalation Solution1000mg Drug: Placebo	Phase 2

Study Type: Interventional
Study Design: Primary Purpose: Treatment
Study Phase: Phase 2
Interventional Study Model: Parallel Assignment
Masking: Participant, Care Provider, Outcomes Assessor
Allocation: Randomized

Official Title: Single-dose, Dose Escalation Study to Assess the Safety, Tolerability, Pharmacokinetics and Bronchodilatory Effects of Glycopyrrolate Inhalation Solution (GIS) Using a High Efficiency Nebulizer in Patients With COPD

Further study details as provided by Sunovion Respiratory Development Inc.:

Primary Outcome Measure:

- Number of Subjects Who Died [Time Frame: 0-47 days]
- Number of Subjects With Treatment Emergent SAEs [Time Frame: 0-47 days]
  AEs are defined as existing conditions which worsen or events which occur during the course of the clinical trial after treatment.
- Number of Subjects Who Discontinued Due to AE [Time Frame: 0-47 days]
  AEs are defined as existing conditions which worsen or events which occur during the course of the clinical trial after treatment.
- Percentage of Subjects With Treatment Emergent AEs [Time Frame: 0-47 days]
  AEs are defined as existing conditions which worsen or events which occur during the course of the clinical trial after treatment.
- Number of Subjects With Clinically Significant Abnormal Vital Signs Reported During the Study [Time Frame: 30hr post dose]
  Vital signs were measured at screening, during the study (pre-dose, and 30 and 60 minutes and 2, 4, 8, 12, 24 and 30 hours post-dose) and at post study assessment. The clinical significance of each out of normal range vital sign parameter was determined by the investigator during the study.
- Number of Clinically Significant Abnormal Laboratory Results Reported During the Study [Time Frame: day 47]
  Clinical safety lab parameters were collected at screening and at the post study assessment. The clinical significance of each out of normal range laboratory parameter was determined by the investigator during the study.
- Number of Subjects With Clinically Significant ECG Parameters Reported During the Study [Time Frame: 30hr post dose]
  ECGs were measured at screening, during the study (pre-dose, and 30 and 60 minutes and 2, 4, 8, 12, 24 and 30 hours post-dose) and at post study assessment.

- Number of Clinically Significant Abnormal Laboratory Results Reported During the Study [Time Frame: Day 14]
  Clinical safety lab parameters were collected at screening and at the post study assessment. The clinical significance of each out of normal range laboratory parameter was determined by the investigator during the study.

- Number of Subjects With Treatment Emergent AEs [Time Frame: 0-47 days]

Secondary Outcome Measures:

- Trough FEV1 (Change From Baseline) [Time Frame: 24hr post dose]
  Spirometry measurements were conducted in accordance with the current ATS/ERS 2005 guidelines. Trough FEV1 was defined as the spirometry value collected at 24 hours post dose within each Treatment Period.

- Peak FEV1 (Percent Change) [Time Frame: 0 to 4hr]
  Spirometry measurements were conducted in accordance with the current ATS/ERS 2005 guidelines.

- Peak FEV1 (Change From Baseline) [Time Frame: 0 to 4hr]
  Spirometry measurements were conducted in accordance with the current ATS/ERS 2005 guidelines.

- FEV1 AUC0-24 Area Under the FEV1 Over Time Curve (Change From Baseline) [Time Frame: 0 to 24hr]
  Spirometry measurements were conducted in accordance with the current ATS/ERS 2005 guidelines.

- Cmax Maximum Observed Plasma Concentration [Time Frame: 0 to 12 hours]
  Pk parameters are calculated from glycopyrrolate plasma concentration analysed from serial blood samples collected between 0 and 12 hr

- Tmax Time to Maximum Observed Plasma Concentration [Time Frame: 0 to 12 hours]
  Pk parameters are calculated from glycopyrrolate plasma concentration analysed from serial blood samples collected between 0 and 12 hr

- AUC0-t Area Under the Plasma Concentration-time Curve From Time Zero to the Last Quantifiable Concentration [Time Frame: 0 to 12 hours]
  Pk parameters are calculated from glycopyrrolate plasma concentration analysed from serial blood samples collected between 0 and 12 hr

- AUC0-inf Area Under the Plasma Concentration-time Curve From Time Zero to Infinity [Time Frame: 0 to 12 hours]
  Pk parameters are calculated from glycopyrrolate plasma concentration analysed from serial blood samples collected between 0 and 12 hr

- t1/2 Plasma Half-life [Time Frame: 0 to 12 hours]
  Pk parameters are calculated from glycopyrrolate plasma concentration analysed from serial blood samples collected between 0 and 12 hr

Enrollment: 12
Study Start Date: May 2009
Study Completion Date: July 2009
Primary Completion Date: July 2009

Arms	Assigned Interventions
Experimental: Glycopyrrolate Inhalation Solution 25mg Glycopyrrolate Inhalation Solution 25 µg via eFlow nebulizer, once daily	Drug: Glycopyrrolate Inhalation Solution 25mg 25 µg oral inhalation via eFlow Nebulizer, once daily Other Names: • GIS
Experimental: Glycopyrrolate Inhalation Solution 75mg Glycopyrrolate Inhalation Solution 75 µg via eFlow nebulizer, once daily	Drug: Glycopyrrolate Inhalation Solution 75mg 75 µg oral inhalation via eFlow Nebulizer, once daily Other Names: • GIS
Experimental: Glycopyrrolate Inhalation Solution 200mg Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily	Drug: Glycopyrrolate Inhalation Solution 200mg 200 µg oral inhalation via eFlow Nebulizer, once daily Other Names: • GIS
Experimental: Glycopyrrolate Inhalation Solution 200mg Jet Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily	Drug: Glycopyrrolate Inhalation Solution 200mg Jet 200 µg oral inhalation via inhalation via jet nebulizer, once daily Other Names: • GIS
Experimental: Glycopyrrolate Inhalation Solution 500mg Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily	Drug: Glycopyrrolate Inhalation Solution 500mg 500 µg oral inhalation via eFlow nebulizer, once daily Other Names: • GIS
Experimental: Glycopyrrolate Inhalation Solution1000mg Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily	Drug: Glycopyrrolate Inhalation Solution1000mg 1000 µg oral inhalation via eFlow nebulizer, once daily Other Names:

	• GIS
Placebo Comparator: Placebo 0.5 mL Placebo 0.5 mL via jet nebulizer, once daily	Drug: Placebo Placebo 0.5 mL oral inhalation via jet nebulizer, once daily Other Names: • Placebo

Eligibility

Ages Eligible for Study: 40 Years to 75 Years

Sexes Eligible for Study: All

Inclusion Criteria:

1. Male and female patients aged 40 through 75 years, inclusive
2. A clinical diagnosis of COPD according to the GOLD guidelines
3. Current smokers or ex-smokers with at least 10 pack-year smoking history (e.g., at least 1 pack/day for 10 years, or 10 packs/day for 1 year)
4. Post-bronchodilator FEV1 40-80% of predicted normal
5. Post-bronchodilator FEV1/FVC ratio < 0.70
6. Improvement in FEV1 >12% (minimum 150 mL) following inhalation of ipratropium bromide
7. Ability to perform reproducible spirometry according to the ATS/ERS guidelines
8. If female and of childbearing potential, must have had a negative pregnancy test and was not lactating at the Screening Visit, and was using one of the following acceptable means of birth control throughout the study:
   - Post-menopausal for at least two years
   - Surgically sterile
   - Oral contraceptives (taken for at least one month prior to the Screening Visit)
   - Approved implantable or injectable contraceptives (e.g., Norplant®, Depo-Provera® or equivalent)
   - Barrier methods (e.g., condoms with spermicide)
   - Intrauterine device (i.e., IUD)
   - Vasectomy of male partner
   - Non-heterosexual life style
9. Willing and able to provide written informed consent

Exclusion Criteria:

1. Current evidence or recent history of any clinically significant disease (other than COPD) or abnormality in the opinion of the Investigator that would put the patients at risk or which would compromise the quality of the study data; including but not limited to cardiovascular disease, myocardial infraction, hypertension, arrhythmia, diabetes, neurological or neuromuscular disease, liver disease, gastrointestinal disease or electrolyte abnormalities.
2. Recent history of an exacerbation of airway disease within 3 months or need for increased treatments for COPD within 6 weeks prior to the Screening Visit.
3. Regular use of daily oxygen therapy.
4. Use of systemic (e.g., intramuscular or intravenous) steroids within 3 months prior to the Screening Visit
5. Respiratory tract infection within 6 weeks prior to the Screening Visit
6. History of tuberculosis, bronchiectasis or other non-specific pulmonary disease
7. History of urinary retention or bladder neck obstruction type symptoms
8. History of narrow-angle glaucoma
9. Current or recent history (previous 12 months) of excessive use or abuse of alcohol
10. Current evidence or history of abusing legal drugs or the use of illegal drugs or substances
11. History of hypersensitivity or intolerance to aerosol medications
12. Participation in another investigational drug study where drug was received within 30 days prior to the Screening Visit

Contacts and Locations

Investigators

Study Chair: Ahmet Tutuncu, MD, PhD Elevation Pharmaceuticals, Inc.(now known as Sunovion Respiratory Development Inc.)

More Information

ClinicalTrials.gov Identifier: NCT02951312

Responsible Party: Sunovion Respiratory Development Inc.

Other Study ID Numbers: EP-101-01
2009-010821-38

Human Subjects Protection Review Board Status: Approved

Study Results

Participant Flow

Recruitment Details	
Pre-Assignment Details	

Arm/Group Title	Total Participants	Total

▼ Arm/Group Description	Total participants in study were 12 subjects	(Not public)
Period Title: **Overall Study**		
Started	12	12
Completed	12	12
Not Completed	0	0

Baseline Characteristics

		Arm/Group Title	Total Participants	
		▼ Arm/Group Description	Total participants in study were 12 subjects	
		Overall Number of Baseline Participants	12	
		▼ Baseline Analysis Population Description	All participants in study	
Age, Categorical Measure Type: Count of Participants Unit of measure: participants	Number Analyzed		12 participants	
	<=18 years		0	0%
	Between 18 and 65 years		5	41.67%
	>=65 years		7	58.33%
Age, Continuous Mean (Standard Deviation) Unit of measure: years	Number Analyzed		12 participants	
			64.8 (6.67)	
Sex: Female, Male Measure Type: Count of Participants Unit of measure: participants	Number Analyzed		12 participants	
	Female		5	41.67%
	Male		7	58.33%
Region of Enrollment Measure Type: Number Unit of measure: participants	Number Analyzed		12 participants	
United Kingdom			12	

Outcome Measures

1. Primary Outcome

Title:	Number of Subjects Who Died
▼ Description:	[Not specified]
Time Frame:	0-47 days

▼ Outcome Measure Data ✓

▼ Analysis Population Description
all subjects who received at least one dose of study medication were included in the safety analysis

Arm/Group Title	Glycopyrrolate Inhalation Solution 25mg	Glycopyrrolate Inhalation Solution 75mg	Glycopyrrolate Inhalation Solution 200mg	Glycopyrrolate Inhalation Solution 200mg Jet	Glycopyrrolate Inhalation Solution 500mg	Glycopyrrolate Inhalation Solution1000mg	Placebo 0.5 mL
▼ Arm/Group Description:	Glycopyrrolate Inhalation Solution 25 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 25mg: 25 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 75 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 75mg: 75 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily	Placebo 0.5 mL via jet nebulizer, once daily Placebo: Placebo 0.5 mL oral inhalation via jet nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6	6	6	6
Measure Type: Number Unit of Measure: participants	0	0	0	0	0	0	0

2. Primary Outcome

Title:	Number of Subjects With Treatment Emergent SAEs

Description:	AEs are defined as existing conditions which worsen or events which occur during the course of the clinical trial after treatment.
Time Frame:	0-47 days

Outcome Measure Data

Analysis Population Description
all subjects who received at least one dose of study medication were included in the safety analysis

Arm/Group Title	Glycopyrrolate Inhalation Solution 25mg	Glycopyrrolate Inhalation Solution 75mg	Glycopyrrolate Inhalation Solution 200mg	Glycopyrrolate Inhalation Solution 200mg Jet	Glycopyrrolate Inhalation Solution 500mg	Glycopyrrolate Inhalation Solution1000mg	Placebo 0.5 mL
Arm/Group Description:	Glycopyrrolate Inhalation Solution 25 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 25mg: 25 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 75 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 75mg: 75 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily	Placebo 0.5 mL via jet nebulizer, once daily Placebo: Placebo 0.5 mL oral inhalation via jet nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6	6	6	6
Measure Type: Number Unit of Measure: participants	0	0	0	0	0	0	0

3. Primary Outcome

Title:	Number of Subjects Who Discontinued Due to AE
Description:	AEs are defined as existing conditions which worsen or events which occur during the course of the clinical trial after treatment.
Time Frame:	0-47 days

Outcome Measure Data

Analysis Population Description
all subjects who received at least one dose of study medication were included in the safety analysis

Arm/Group Title	Glycopyrrolate Inhalation Solution 25mg	Glycopyrrolate Inhalation Solution 75mg	Glycopyrrolate Inhalation Solution 200mg	Glycopyrrolate Inhalation Solution 200mg Jet	Glycopyrrolate Inhalation Solution 500mg	Glycopyrrolate Inhalation Solution1000mg	Placebo 0.5 mL
Arm/Group Description:	Glycopyrrolate Inhalation Solution 25 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 25mg: 25 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 75 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 75mg: 75 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily	Placebo 0.5 mL via jet nebulizer, once daily Placebo: Placebo 0.5 mL oral inhalation via jet nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6	6	6	6
Measure Type: Number Unit of Measure: participants	0	0	0	0	0	0	0

4. Primary Outcome

Title:	Percentage of Subjects With Treatment Emergent AEs
Description:	AEs are defined as existing conditions which worsen or events which occur during the course of the clinical trial after treatment.
Time Frame:	0-47 days

Outcome Measure Data

▼ Analysis Population Description
all subjects who received at least one dose of study medication were included in the safety analysis

Arm/Group Title	Glycopyrrolate Inhalation Solution 25mg	Glycopyrrolate Inhalation Solution 75mg	Glycopyrrolate Inhalation Solution 200mg	Glycopyrrolate Inhalation Solution 200mg Jet	Glycopyrrolate Inhalation Solution 500mg	Glycopyrrolate Inhalation Solution1000mg	Placebo 0.5 mL
▼ Arm/Group Description:	Glycopyrrolate Inhalation Solution 25 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 25mg: 25 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 75 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 75mg: 75 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily	Placebo 0.5 mL via jet nebulizer, once daily Placebo: Placebo 0.5 mL oral inhalation via jet nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6	6	6	6
Measure Type: Number Unit of Measure: percentage of participants	33.3	33.3	66.7	33.3	0.0	33.3	16.7

5. Primary Outcome

Title:	Number of Subjects With Clinically Significant Abnormal Vital Signs Reported During the Study
▼ Description:	Vital signs were measured at screening, during the study (pre-dose, and 30 and 60 minutes and 2, 4, 8, 12, 24 and 30 hours post-dose) and at post study assessment. The clinical significance of each out of normal range vital sign parameter was determined by the investigator during the study.
Time Frame:	30hr post dose

▼ Outcome Measure Data ✔

▼ Analysis Population Description
all subjects who received at least one dose of study medication were included in the safety analysis

Arm/Group Title	Glycopyrrolate Inhalation Solution 25mg	Glycopyrrolate Inhalation Solution 75mg	Glycopyrrolate Inhalation Solution 200mg	Glycopyrrolate Inhalation Solution 200mg Jet	Glycopyrrolate Inhalation Solution 500mg	Glycopyrrolate Inhalation Solution1000mg	Placebo 0.5 mL
▼ Arm/Group Description:	Glycopyrrolate Inhalation Solution 25 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 25mg: 25 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 75 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 75mg: 75 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily	Placebo 0.5 mL via jet nebulizer, once daily Placebo: Placebo 0.5 mL oral inhalation via jet nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6	6	6	6
Measure Type: Number Unit of Measure: participants	0	0	0	0	0	0	0

6. Primary Outcome

Title:	Number of Clinically Significant Abnormal Laboratory Results Reported During the Study
▼ Description:	Clinical safety lab parameters were collected at screening and at the post study assessment. The clinical significance of each out of normal range laboratory parameter was determined by the investigator during the study.
Time Frame:	day 47

▼ Outcome Measure Data ✔

▼ Analysis Population Description

all subjects who received at least one dose of study medication were included in the safety analysis

Arm/Group Title	Glycopyrrolate Inhalation Solution 25mg	Glycopyrrolate Inhalation Solution 75mg	Glycopyrrolate Inhalation Solution 200mg	Glycopyrrolate Inhalation Solution 200mg Jet	Glycopyrrolate Inhalation Solution 500mg	Glycopyrrolate Inhalation Solution1000mg	Placebo 0.5 mL
▼ Arm/Group Description:	Glycopyrrolate Inhalation Solution 25 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 25mg: 25 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 75 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 75mg: 75 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily	Placebo 0.5 mL via jet nebulizer, once daily Placebo: Placebo 0.5 mL oral inhalation via jet nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6	6	6	6
Measure Type: Number Unit of Measure: participants	0	0	0	0	0	0	0

7. Primary Outcome

Title:	Number of Subjects With Clinically Significant ECG Parameters Reported During the Study
▼ Description:	ECGs were measured at screening, during the study (pre-dose, and 30 and 60 minutes and 2, 4, 8, 12, 24 and 30 hours post-dose) and at post study assessment.
Time Frame:	30hr post dose

▼ Outcome Measure Data ✔

▼ Analysis Population Description
all subjects who received at least one dose of study medication were included in the safety analysis

Arm/Group Title	Glycopyrrolate Inhalation Solution 25mg	Glycopyrrolate Inhalation Solution 75mg	Glycopyrrolate Inhalation Solution 200mg	Glycopyrrolate Inhalation Solution 200mg Jet	Glycopyrrolate Inhalation Solution 500mg	Glycopyrrolate Inhalation Solution1000mg	Placebo 0.5 mL
▼ Arm/Group Description:	Glycopyrrolate Inhalation Solution 25 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 25mg: 25 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 75 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 75mg: 75 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily	Placebo 0.5 mL via jet nebulizer, once daily Placebo: Placebo 0.5 mL oral inhalation via jet nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6	6	6	6
Measure Type: Number Unit of Measure: participants	0	0	0	0	0	0	0

8. Primary Outcome

Title:	Number of Clinically Significant Abnormal Laboratory Results Reported During the Study
▼ Description:	Clinical safety lab parameters were collected at screening and at the post study assessment. The clinical significance of each out of normal range laboratory parameter was determined by the investigator during the study.
Time Frame:	Day 14

▼ Outcome Measure Data ✔

▼ Analysis Population Description
all subjects who received at least one dose of study medication were included in the safety analysis

Arm/Group Title	Glycopyrrolate Inhalation Solution 25mg	Glycopyrrolate Inhalation Solution 75mg	Glycopyrrolate Inhalation Solution 200mg	Glycopyrrolate Inhalation Solution 200mg Jet	Glycopyrrolate Inhalation Solution 500mg	Glycopyrrolate Inhalation Solution1000mg	Placebo 0.5 mL
▼ Arm/Group Description:	Glycopyrrolate Inhalation Solution 25 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 25mg: 25 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 75 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 75mg: 75 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily	Placebo 0.5 mL via jet nebulizer, once daily Placebo: Placebo 0.5 mL oral inhalation via jet nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6	6	6	6
Measure Type: Number Unit of Measure: participants	0	0	0	0	0	0	0

9. Primary Outcome

Title:	Number of Subjects With Treatment Emergent AEs
▼ Description:	[Not specified]
Time Frame:	0-47 days

▼ Outcome Measure Data ✔

▼ Analysis Population Description
all subjects who received at least one dose of study medication were included in the safety analysis

Arm/Group Title	Glycopyrrolate Inhalation Solution 25mg	Glycopyrrolate Inhalation Solution 75mg	Glycopyrrolate Inhalation Solution 200mg	Glycopyrrolate Inhalation Solution 200mg Jet	Glycopyrrolate Inhalation Solution 500mg	Glycopyrrolate Inhalation Solution1000mg	Placebo 0.5 mL
▼ Arm/Group Description:	Glycopyrrolate Inhalation Solution 25 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 25mg: 25 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 75 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 75mg: 75 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily	Placebo 0.5 mL via jet nebulizer, once daily Placebo: Placebo 0.5 mL oral inhalation via jet nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6	6	6	6
Measure Type: Number Unit of Measure: participants	2	2	4	2	0	2	1

10. Secondary Outcome

Title:	Trough FEV1 (Change From Baseline)
▼ Description:	Spirometry measurements were conducted in accordance with the current ATS/ERS 2005 guidelines. Trough FEV1 was defined as the spirometry value collected at 24 hours post dose within each Treatment Period.
Time Frame:	24hr post dose

▼ Outcome Measure Data ✔

▼ Analysis Population Description
All subjects who received at least one dose of study medication and have at least one post baseline efficacy measurement were included in the efficacy population.

Arm/Group Title	Glycopyrrolate Inhalation Solution 25mg	Glycopyrrolate Inhalation Solution 75mg	Glycopyrrolate Inhalation	Glycopyrrolate Inhalation	Glycopyrrolate Inhalation	Glycopyrrolate Inhalation Solution1000mg	Placebo 0.5 mL

			Solution 200mg	Solution 200mg Jet	Solution 500mg		
▼ Arm/Group Description:	Glycopyrrolate Inhalation Solution 25 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 25mg: 25 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 75 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 75mg: 75 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily	Placebo 0.5 mL via jet nebulizer, once daily Placebo: Placebo 0.5 mL oral inhalation via jet nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6	6	6	6
Mean (Standard Deviation) Unit of Measure: liters	0.038 (0.157)	0.087 (0.062)	0.138 (0.079)	-0.013 (0.098)	-0.017 (0.168)	0.065 (0.072)	-0.030 (0.070)

11. Secondary Outcome

Title:	Peak FEV1 (Percent Change)
▼ Description:	Spirometry measurements were conducted in accordance with the current ATS/ERS 2005 guidelines.
Time Frame:	0 to 4hr

▼ Outcome Measure Data ✔

▼ Analysis Population Description

all subjects who received at least one dose of the study medication and have at least one post baseline efficacy measurement were included in the efficacy population

Arm/Group Title	Glycopyrrolate Inhalation Solution 25mg	Glycopyrrolate Inhalation Solution 75mg	Glycopyrrolate Inhalation Solution 200mg	Glycopyrrolate Inhalation Solution 200mg Jet	Glycopyrrolate Inhalation Solution 500mg	Glycopyrrolate Inhalation Solution1000mg	Placebo 0.5 mL
▼ Arm/Group Description:	Glycopyrrolate Inhalation Solution 25 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 25mg: 25 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 75 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 75mg: 75 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily	Placebo 0.5 mL via jet nebulizer, once daily Placebo: Placebo 0.5 mL oral inhalation via jet nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6	6	6	6
Mean (Standard Deviation) Unit of Measure: percent change	17.12 (9.07)	15.60 (4.20)	22.98 (4.99)	19.28 (13.10)	11.47 (6.86)	16.87 (6.83)	6.80 (2.91)

12. Secondary Outcome

Title:	Peak FEV1 (Change From Baseline)
▼ Description:	Spirometry measurements were conducted in accordance with the current ATS/ERS 2005 guidelines.
Time Frame:	0 to 4hr

▼ Outcome Measure Data ✔

▼ Analysis Population Description

All subjects who received at least one dose of study medication and have at least one post baseline efficacy measurement were included in the efficacy population.

Arm/Group Title	Glycopyrrolate Inhalation Solution 25mg	Glycopyrrolate Inhalation Solution 75mg	Glycopyrrolate Inhalation	Glycopyrrolate Inhalation	Glycopyrrolate Inhalation	Glycopyrrolate Inhalation Solution1000mg	Placebo 0.5 mL

			Solution 200mg	Solution 200mg Jet	Solution 500mg		
▼ Arm/Group Description:	Glycopyrrolate Inhalation Solution 25 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 25mg: 25 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 75 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 75mg: 75 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily	Placebo 0.5 mL via jet nebulizer, once daily Placebo: Placebo 0.5 mL oral inhalation via jet nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6	6	6	6
Mean (Standard Deviation) Unit of Measure: liters	0.212 (0.086)	0.255 (0.068)	0.303 (0.055)	0.233 (0.144)	0.177 (0.061)	0.283 (0.069)	0.120 (0.057)

13. Secondary Outcome

Title:	FEV1 AUC0-24 Area Under the FEV1 Over Time Curve (Change From Baseline)
▼ Description:	Spirometry measurements were conducted in accordance with the current ATS/ERS 2005 guidelines.
Time Frame:	0 to 24hr

▼ Outcome Measure Data ✔

▼ Analysis Population Description
All subjects who received at least one dose of study medication and have at least one post baseline efficacy measurement were included in the efficacy population.

Arm/Group Title	Glycopyrrolate Inhalation Solution 25mg	Glycopyrrolate Inhalation Solution 75mg	Glycopyrrolate Inhalation Solution 200mg	Glycopyrrolate Inhalation Solution 200mg Jet	Glycopyrrolate Inhalation Solution 500mg	Glycopyrrolate Inhalation Solution1000mg	Placebo 0.5 mL
▼ Arm/Group Description:	Glycopyrrolate Inhalation Solution 25 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 25mg: 25 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 75 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 75mg: 75 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily	Placebo 0.5 mL via jet nebulizer, once daily Placebo: Placebo 0.5 mL oral inhalation via jet nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6	6	6	6
Mean (Standard Deviation) Unit of Measure: liters	1.59 (3.27)	3.10 (2.27)	3.19 (1.14)	1.35 (2.74)	1.53 (2.05)	3.08 (1.47)	-0.11 (1.89)

14. Secondary Outcome

Title:	Cmax Maximum Observed Plasma Concentration
▼ Description:	Pk parameters are calculated from glycopyrrolate plasma concentration analysed from serial blood samples collected between 0 and 12 hr
Time Frame:	0 to 12 hours

▼ Outcome Measure Data ✔

▼ Analysis Population Description
All subjects who received at least one dose of study medication and who have sufficient blood samples taken to obtain a plasma concentration by time profile were included in the PK analysis.

Arm/Group Title	Glycopyrrolate Inhalation Solution 200mg	Glycopyrrolate Inhalation Solution 200mg Jet	Glycopyrrolate Inhalation Solution 500mg	Glycopyrrolate Inhalation Solution1000mg
▼ Arm/Group Description:				

	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6
Mean (Standard Deviation) Unit of Measure: pg/mL	177.242 (61.469)	75.530 (64.950)	749.872 (219.696)	1534.057 (442.581)

15. Secondary Outcome

Title:	Tmax Time to Maximum Observed Plasma Concentration
▼ Description:	Pk parameters are calculated from glycopyrrolate plasma concentration analysed from serial blood samples collected between 0 and 12 hr
Time Frame:	0 to 12 hours

▼ Outcome Measure Data ✔

▼ Analysis Population Description

All subjects who received at least one dose of study medication and who have sufficient blood samples taken to obtain a plasma concentration by time profile were included in the PK analysis.

Arm/Group Title	Glycopyrrolate Inhalation Solution 200mg	Glycopyrrolate Inhalation Solution 200mg Jet	Glycopyrrolate Inhalation Solution 500mg	Glycopyrrolate Inhalation Solution1000mg
▼ Arm/Group Description:	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6
Mean (Standard Deviation) Unit of Measure: hours	.025 (0.088)	0.08 (0.088)	0.25 (0.069)	0.17 (0.093)

16. Secondary Outcome

Title:	AUC0-t Area Under the Plasma Concentration-time Curve From Time Zero to the Last Quantifiable Concentration
▼ Description:	Pk parameters are calculated from glycopyrrolate plasma concentration analysed from serial blood samples collected between 0 and 12 hr
Time Frame:	0 to 12 hours

▼ Outcome Measure Data ✔

▼ Analysis Population Description

All subjects who received at least one dose of study medication and who have sufficient blood samples taken to obtain a plasma concentration by time profile were included in the PK analysis.

Arm/Group Title	Glycopyrrolate Inhalation Solution 200mg	Glycopyrrolate Inhalation Solution 200mg Jet	Glycopyrrolate Inhalation Solution 500mg	Glycopyrrolate Inhalation Solution1000mg
▼ Arm/Group Description:	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6
Mean (Standard Deviation) Unit of Measure: pg/mL.h	429.335 (192.699)	26.176 (16.170)	2014.276 (609.911)	4084.763 (827.225)

17. Secondary Outcome

Title:	AUC0-inf Area Under the Plasma Concentration-time Curve From Time Zero to Infinity
▼ Description:	

	Pk parameters are calculated from glycopyrrolate plasma concentration analysed from serial blood samples collected between 0 and 12 hr
Time Frame:	0 to 12 hours

▼ Outcome Measure Data ✔

▼ Analysis Population Description

All subjects who received at least one dose of study medication and who have sufficient blood samples taken to obtain a plasma concentration by time profile were included in the PK analysis.

Arm/Group Title	Glycopyrrolate Inhalation Solution 200mg	Glycopyrrolate Inhalation Solution 200mg Jet	Glycopyrrolate Inhalation Solution 500mg	Glycopyrrolate Inhalation Solution1000mg
▼ Arm/Group Description:	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6
Mean (Standard Deviation) Unit of Measure: pg/mL.h	563.416 (235.418)	65.013 (16.750)	2491.803 (736.426)	5271.099 (1096.862)

18. Secondary Outcome

Title:	t1/2 Plasma Half-life
▼ Description:	Pk parameters are calculated from glycopyrrolate plasma concentration analysed from serial blood samples collected between 0 and 12 hr
Time Frame:	0 to 12 hours

▼ Outcome Measure Data ✔

▼ Analysis Population Description

All subjects who received at least one dose of study medication and who have sufficient blood samples taken to obtain a plasma concentration by time profile were included in the PK analysis.

Arm/Group Title	Glycopyrrolate Inhalation Solution 200mg	Glycopyrrolate Inhalation Solution 200mg Jet	Glycopyrrolate Inhalation Solution 500mg	Glycopyrrolate Inhalation Solution1000mg
▼ Arm/Group Description:	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg: 200 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via jet nebulizer, once daily Glycopyrrolate Inhalation Solution 200mg Jet: 200 µg oral inhalation via inhalation via jet nebulizer, once daily	Glycopyrrolate Inhalation Solution 500 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 500mg: 500 µg oral inhalation via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 1000 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution1000mg: 1000 µg oral inhalation via eFlow nebulizer, once daily
Overall Number of Participants Analyzed	6	6	6	6
Mean (Standard Deviation) Unit of Measure: pg/mL.h	2.947 (1.996)	0.778 (0.465)	6.298 (1.450)	7.573 (1.031)

Adverse Events

Time Frame	0-47 days
Adverse Event Reporting Description	AE's are defined as existing conditions which worsen or events which occur during the course of the clinical trial after treatment
Source Vocabulary Name for Table Default	MedDRA (11.0)
Collection Approach for Table Default	Systematic Assessment

Arm/Group Title	Glycopyrrolate Inhalation Solution 25 µg	Glycopyrrolate Inhalation Solution75µg	Glycopyrrolate Inhalation Solution 200 µg	Glycopyrrolate Inhalation Solution 200µg Jet Nebulizer,	Glycopyrrolate Inhalation Solution 500µg	Glyc In Solut

Arm/Group Description	Glycopyrrolate Inhalation Solution 25 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 25mg: 25 µg oral inhalation via eFlow Nebulizer, once daily	Glycopyrrolate Inhalation Solution 75 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 75 µg via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily Glycopyrrolate Inhalation Solution 200 µg via eFlow nebulizer, once daily	Glycopyrrolate Inhalation Solution 200µg Jet Nebulizer ,once daily Glycopyrrolate Inhalation Solution 200µg Jet Nebulizer, once daily	Glycopyrrolate Inhalation Solution 500µg eFlow Nebulizer, once daily Glycopyrrolate Inhalation Solution 500µg eFlow Nebulizer, once daily	Glycopy Inhalatic Solution eFlow n once da Glycopy Inhalatic Solution eFlow n once da

All-Cause Mortality

	Glycopyrrolate Inhalation Solution 25 µg	Glycopyrrolate Inhalation Solution75µg	Glycopyrrolate Inhalation Solution 200 µg	Glycopyrrolate Inhalation Solution 200µg Jet Nebulizer,	Glycopyrrolate Inhalation Solution 500µg	Glyc Inl Soluti
	Affected / at Risk (%)	Affected / at Risk (%)	Affected / at Risk (%)	Affected / at Risk (%)	Affected / at Risk (%)	Affected Risk (
Total	--- /---	--- /---	--- /---	--- /---	--- /---	--- /--

Serious Adverse Events

	Glycopyrrolate Inhalation Solution 25 µg		Glycopyrrolate Inhalation Solution75µg		Glycopyrrolate Inhalation Solution 200 µg		Glycopyrrolate Inhalation Solution 200µg Jet Nebulizer,		Glycopyrrolate Inhalation Solution 500µg		Glyc Inl Soluti
	Affected / at Risk (%)	# Events	Affected / at Risk (%)	# Events	Affected / at Risk (%)	# Events	Affected / at Risk (%)	# Events	Affected / at Risk (%)	# Events	Affected Risk (
Total	0/6 (0%)		0/6 (0%)		0/6 (0%)		0/6 (0%)		0/6 (0%)		0/6 (0

Other (Not Including Serious) Adverse Events

Frequency Threshold for Reporting Other Adverse Events	5%										
	Glycopyrrolate Inhalation Solution 25 µg		Glycopyrrolate Inhalation Solution75µg		Glycopyrrolate Inhalation Solution 200 µg		Glycopyrrolate Inhalation Solution 200µg Jet Nebulizer,		Glycopyrrolate Inhalation Solution 500µg		Glyc Inl Soluti
	Affected / at Risk (%)	# Events	Affected / at Risk (%)	# Events	Affected / at Risk (%)	# Events	Affected / at Risk (%)	# Events	Affected / at Risk (%)	# Events	Affected Risk (
Total	2/6 (33.33%)		2/6 (33.33%)		4/6 (66.67%)		2/6 (33.33%)		0/6 (0%)		2/6 (33.
General disorders											
catheter site related reaction †A	1/6 (16.67%)	1	0/6 (0%)	0	0/6 (0%)	0	2/6 (33.33%)	4	0/6 (0%)	0	2/6 (33.
Infections and infestations											
nasopharyngitis †A	0/6 (0%)	0	0/6 (0%)	0	1/6 (16.67%)	1	0/6 (0%)	0	0/6 (0%)	0	0/6 (0
rhinitis †A	0/6 (0%)	0	0/6 (0%)	0	1/6 (16.67%)	1	0/6 (0%)	0	0/6 (0%)	0	0/6 (0
Musculoskeletal and connective tissue disorders											
musculoskeletal discomfort †A	0/6 (0%)	0	0/6 (0%)	0	0/6 (0%)	0	1/6 (16.67%)	1	0/6 (0%)	0	0/6 (0
Nervous system disorders											
headache †A	1/6 (16.67%)	1	1/6 (16.67%)	2	3/6 (50%)	4	1/6 (16.67%)	1	0/6 (0%)	0	0/6 (0
Respiratory, thoracic and mediastinal disorders											
cough †A	0/6 (0%)	0	2/6 (33.33%)	2	0/6 (0%)	0	2/6 (33.33%)	2	0/6 (0%)	0	2/6 (33.

† Indicates events were collected by systematic assessment.
A Term from vocabulary, MedDRA (11.0)

Limitations and Caveats

none

More Information

Certain Agreements

Principal Investigators are NOT employed by the organization sponsoring the study.

There IS an agreement between the Principal Investigator and the Sponsor (or its agents) that restricts the PI's rights to discuss or publish trial results after the trial is completed.

In the event the Study is part of a multi-center study, the first publication of the results of the Study shall be made in conjunction with the results of other participating study sites as a multi-center publication; provided however, if a multi-center publication is not forthcoming within twenty-four (24) months following completion of the Study at all sites, Institution and Investigator shall be free to publish.

Results Point of Contact

Name/Official Title:	Respiratory Medical Director
Organization:	Sunovion Pharmaceuticals Inc.
Phone:	1-866-503-6351
Email:	---