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Trial record **1 of 1** for: CNVA237A2304

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A Study to Assess the Safety, Tolerability and Efficacy of NVA237 Versus Placebo (GLOW 1)

This study has been completed.

Sponsor:
Novartis

Information provided by (Responsible Party):
Novartis

ClinicalTrials.gov Identifier:
NCT01005901

First received: October 30, 2009
Last updated: March 15, 2012
Last verified: December 2011
History of Changes

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Results First Received: December 15, 2011

Study Type:	Interventional
Study Design:	Allocation: Randomized; Intervention Model: Parallel Assignment; Masking: Double Blind (Subject, Caregiver, Investigator, Outcomes Assessor); Primary Purpose: Treatment
Condition:	Chronic Obstructive Pulmonary Disease
Interventions:	Drug: Glycopyrronium bromide Drug: Placebo

Participant Flow

Hide Participant Flow

Recruitment Details

Key information relevant to the recruitment process for the overall study, such as dates of the recruitment period and locations
No text entered.

Pre-Assignment Details

Significant events and approaches for the overall study following participant enrollment, but prior to group assignment
1324 participants were screened. 822 participants entered the study.

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Participant Flow: Overall Study

	Glycopyrronium Bromide	Placebo
STARTED	**552**	**270**
Safety Population	**550**	**267**
Full Analysis Set	**534**	**260**
COMPLETED	**450**	**212**
NOT COMPLETED	**102**	**58**
Withdrawal by Subject	**38**	**14**

Adverse Event	**30**	**16**
Administrative problems	**21**	**13**
Unsatisfactory therapeutic effect	**5**	**5**
Protocol Violation	**4**	**3**
Death	**2**	**3**
Lost to Follow-up	**1**	**2**
Patient's inability to use the device	**1**	**1**
No longer requires study drug	**0**	**1**

Baseline Characteristics

Hide Baseline Characteristics

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
No text entered.

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Total	Total of all reporting groups

Baseline Measures

	Glycopyrronium Bromide	Placebo	Total
Number of Participants [units: participants]	550	267	817
Age, Customized [1] [units: participants]			
<65 years	278	134	412
65 to <75 years	199	98	297
>=75 years	73	35	108
Gender [units: participants]			
Female	96	52	148
Male	454	215	669

[1] All baseline measures are based on safety population.

Outcome Measures

Hide All Outcome Measures

1. Primary: Trough Forced Expiratory Volume in 1 Second (FEV1) at 12 Weeks [Time Frame: 12 weeks]

Measure Type	Primary
Measure Title	Trough Forced Expiratory Volume in 1 Second (FEV1) at 12 Weeks
Measure Description	Spirometry was conducted according to internationally accepted standards. Trough FEV1 was defined as the average of the 23 hour 15 minute and 23 hour 45 minute post-dose FEV1 readings. Mixed model used baseline FEV1,baseline inhaled corticosteroid (ICS) use, FEV1 prior to inhalation of short acting beta-agonist (SABA), and FEV1 45 minutes post-inhalation of SABA as covariates.

Time Frame	12 weeks
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
Full Analysis Set (FAS) The FAS included all randomized patients who received at least one dose of study medication. Patients in this group were analyzed according to the treatment to which they were randomized. Missing trough FEV1 values at week 12 were imputed using LOCF with pre-dose trough FEV1.

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	**Placebo**
Number of Participants Analyzed [units: participants]	**512**	**243**
Trough Forced Expiratory Volume in 1 Second (FEV1) at 12 Weeks [units: Liters] Least Squares Mean (Standard Error)	**1.408 (0.0105)**	**1.301 (0.0137)**

No statistical analysis provided for Trough Forced Expiratory Volume in 1 Second (FEV1) at 12 Weeks

2. Secondary: Transition Dyspnea Index (TDI) Focal Score After 26 Weeks of Treatment [Time Frame: 26 weeks]

Measure Type	Secondary
Measure Title	Transition Dyspnea Index (TDI) Focal Score After 26 Weeks of Treatment
Measure Description	Transition Dyspnea Index (TDI) captures changes from baseline. The TDI score is based on three domains with each domain scored from -3 (major deterioration) to +3 (major improvement), to give an overall score of -9 to +9, a negative score indicating a deterioration from baseline. A TDI focal score of 1 is considered to be a clinically significant improvement from baseline. Mixed model used baseline TDI, baseline inhaled corticosteroid (ICS) use, FEV1 prior to inhalation of short acting beta-agonist (SABA), and FEV1 45 minutes post-inhalation of SABA as covariates.
Time Frame	26 weeks
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
Full Analysis Set (FAS) included all randomized patients who received at least one dose of study medication. Patients per treatment group with no missing data were included in this analysis.

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	**Placebo**
Number of Participants Analyzed	**493**	**240**

[units: participants]		
Transition Dyspnea Index (TDI) Focal Score After 26 Weeks of Treatment [units: Units on a scale] Least Squares Mean (Standard Error)	**1.84 (0.257)**	**0.80 (0.294)**

No statistical analysis provided for Transition Dyspnea Index (TDI) Focal Score After 26 Weeks of Treatment

3. Secondary: Quality of Life Assessment With St. George's Respiratory Questionnaire (SGRQ) Total Score After 26 Weeks of Treatment [Time Frame: 26 weeks]

Measure Type	Secondary
Measure Title	Quality of Life Assessment With St. George's Respiratory Questionnaire (SGRQ) Total Score After 26 Weeks of Treatment
Measure Description	SGRQ is a health related quality of life questionnaire consisting of 51 items in three components: symptoms, activity, and impacts. The lowest possible value is zero and the highest 100. Higher values correspond to greater impairment in quality of life. Mixed model used baseline SGRQ, baseline inhaled corticosteroid (ICS) use, FEV1 prior to inhalation of short acting beta-agonist (SABA), and FEV1 45 minutes post-inhalation of SABA as covariates.
Time Frame	26 weeks
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
Full Analysis Set (FAS) included all randomized patients who received at least one dose of study medication. Individual component score was imputed with LOCF (last observation carried forward).

Reporting Groups

	Description

Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	Placebo
Number of Participants Analyzed [units: participants]	**502**	**246**
Quality of Life Assessment With St. George's Respiratory Questionnaire (SGRQ) Total Score After 26 Weeks of Treatment [units: Units on a scale] Least Squares Mean (Standard Error)	**39.50 (0.813)**	**42.31 (0.992)**

No statistical analysis provided for Quality of Life Assessment With St. George's Respiratory Questionnaire (SGRQ) Total Score After 26 Weeks of Treatment

4. Secondary: Time to First Moderate or Severe Chronic Obstructive Pulmonary Disease (COPD) Exacerbation During 26 Weeks of Treatment [Time Frame: 26 weeks]

Measure Type	Secondary
Measure Title	Time to First Moderate or Severe Chronic Obstructive Pulmonary Disease (COPD) Exacerbation During 26 Weeks of Treatment
Measure Description	The time to the first moderate or severe COPD exacerbation was the study day on which the patient experienced first moderate or severe COPD exacerbation. COPD exacerbations are considered to be moderate if treatment with systemic corticosteroids and/or antibiotics was required. COPD exacerbations are considered to be severe if treatment for moderate severity and hospitalization were required.

Time Frame	26 weeks
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
Full Analysis Set (FAS) included all randomized patients who received at least one dose of study medication. The median values were not estimable.

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	Placebo
Number of Participants Analyzed **[units: participants]**	**534**	**260**
Time to First Moderate or Severe Chronic Obstructive Pulmonary Disease (COPD) Exacerbation During 26 Weeks of Treatment **[units: Days]** **Median (95% Confidence Interval)**	**NA** [1]	**NA** [1]

[1] The median values were not estimable because less than 50% of patients had a moderate or severe COPD exacerbation during the study.

No statistical analysis provided for Time to First Moderate or Severe Chronic Obstructive Pulmonary Disease (COPD) Exacerbation During 26 Weeks of Treatment

5. Secondary: Change From Baseline in the Mean Number of Puffs Per Day of Rescue Medication Over the Study Duration (Baseline to Week 26) [Time Frame: 26 weeks]

Measure Type	Secondary
Measure Title	Change From Baseline in the Mean Number of Puffs Per Day of Rescue Medication Over the Study Duration (Baseline to Week 26)
Measure Description	Participants recorded the number of puffs of rescue medication taken in the previous 12 hours in the morning and evening. The total number of puffs of rescue medication per day over the full 26 weeks was calculated and divided by the total number of days with non-missing rescue medication data to derive the mean daily number of puffs of rescue medication taken for the patient.
Time Frame	26 weeks
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
Full Analysis Set (FAS) included all randomized patients who received at least one dose of study medication. Patients with observations both at baseline and week 26 were included in this analysis

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist

	(salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	Placebo
Number of Participants Analyzed [units: participants]	**529**	**259**
Change From Baseline in the Mean Number of Puffs Per Day of Rescue Medication Over the Study Duration (Baseline to Week 26) [units: Puffs per day] Least Squares Mean (Standard Error)	**-1.21 (0.122)**	**-0.75 (0.156)**

No statistical analysis provided for Change From Baseline in the Mean Number of Puffs Per Day of Rescue Medication Over the Study Duration (Baseline to Week 26)

6. Secondary: FEV1 at Each Time-point on Day 1 and Week 26 [Time Frame: Day 1 and Week 26]

Measure Type	Secondary
Measure Title	FEV1 at Each Time-point on Day 1 and Week 26
Measure Description	Spirometry was conducted according to internationally accepted standards. FEV1 was measured at all time points up to 4 hours post-dose, and at 23 hours 15 min and 23 hours 45 min, by visit. Mixed model used baseline FEV1,baseline inhaled corticosteroid (ICS) use, FEV1 prior to inhalation of short acting beta-agonist (SABA), and FEV1 45 minutes post-inhalation of SABA as covariates.
Time Frame	Day 1 and Week 26
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.

Full Analysis Set (FAS) included all randomized patients who received at least one dose of study medication. “n” indicates number of patients with observation at each time-point

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	Placebo
Number of Participants Analyzed [units: participants]	**519**	**253**
FEV1 at Each Time-point on Day 1 and Week 26 [units: Liters] Least Squares Mean (Standard Error)		
Day 1: 5 min (n = 497, 240)	**1.388 (0.0057)**	**1.295 (0.0076)**
Day 1: 15 min (n = 503, 249)	**1.435 (0.0066)**	**1.292 (0.0087)**
Day 1: 30 min (n = 511, 252)	**1.472 (0.0070)**	**1.299 (0.0093)**
Day 1: 1 hour (n = 513, 253)	**1.493 (0.0070)**	**1.296 (0.0094)**
Day 1: 2 hours (n = 514, 251)	**1.562 (0.0076)**	**1.355 (0.0102)**
Day 1: 3 hours (n = 519, 248)	**1.544 (0.0079)**	**1.349 (0.0108)**
Day 1: 4 hours (n = 514, 247)	**1.548 (0.0077)**	**1.365 (0.0105)**
Day 1: 23 hours 15 min (n = 499, 244)	**1.400 (0.0078)**	**1.289 (0.0103)**
Day 1: 23 hours 45 min (n = 498, 244)	**1.428 (0.0083)**	**1.328 (0.0108)**

Week 26: pre-dose trough (n = 447, 208)	**1.371 (0.0100)**	**1.256 (0.0140)**
Week 26: -45 min (n = 447, 208)	**1.373 (0.0104)**	**1.256 (0.0145)**
Week 26: -15 min (n = 443, 205)	**1.368 (0.0104)**	**1.252 (0.0144)**
Week 26: 5 min (n = 439, 208)	**1.409 (0.0106)**	**1.255 (0.0147)**
Week 26: 15 min (n = 435, 205)	**1.427 (0.0109)**	**1.269 (0.0152)**
Week 26: 30 min (n = 440, 207)	**1.433 (0.0112)**	**1.259 (0.0155)**
Week 26: 1 hour (n = 438, 206)	**1.459 (0.0115)**	**1.251 (0.0159)**
Week 26: 2 hours (n = 438, 203)	**1.508 (0.0114)**	**1.299 (0.0160)**
Week 26: 3 hours (n = 439, 204)	**1.504 (0.0124)**	**1.299 (0.0170)**
Week 26: 4 hours (n = 438, 205)	**1.489 (0.0114)**	**1.312 (0.0158)**
Week 26: 23 hours 15 min (n = 434, 206)	**1.386 (0.0118)**	**1.267 (0.0158)**
Week 26: 23 hours 45 min (n = 434, 206)	**1.396 (0.0116)**	**1.282 (0.0157)**

No statistical analysis provided for FEV1 at Each Time-point on Day 1 and Week 26

7. Secondary: Forced Vital Capacity (FVC) at Each Time-point on Day 1 and Week 26 [Time Frame: Day 1 and Week 26]

Measure Type	Secondary
Measure Title	Forced Vital Capacity (FVC) at Each Time-point on Day 1 and Week 26
Measure Description	Spirometry was conducted according to internationally accepted standards. FVC was calculated at each time point up to 4 hours post-dose and at 23 hours 15 min and 23 hours 45 min, by visit. Mixed model used baseline FVC, baseline inhaled corticosteroid (ICS) use, FEV1 prior to inhalation of short acting beta-agonist (SABA), and FEV1 45 minutes post-inhalation of SABA as covariates.
Time Frame	Day 1 and Week 26

Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
Full Analysis Set (FAS) included all randomized patients who received at least one dose of study medication. “n” indicates number of patients with observation at each time-point.

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	Placebo
Number of Participants Analyzed [units: participants]	**534**	**260**
Forced Vital Capacity (FVC) at Each Time-point on Day 1 and Week 26 [units: Liters] Least Squares Mean (Standard Error)		
Day 1: 5 min (n = 497, 240)	**2.887 (0.0132)**	**2.675 (0.0173)**
Day 1: 15 min (n = 503, 249)	**2.943 (0.0147)**	**2.660 (0.0188)**
Day 1: 30 min (n = 511, 252)	**2.948 (0.0155)**	**2.637 (0.0199)**
Day 1: 1hour (n = 513, 253)	**3.019 (0.0148)**	**2.669 (0.0198)**
Day 1: 2 hours (n = 514, 251)	**3.086 (0.0166)**	**2.754 (0.0219)**

Day 1: 3 hours (n = 519, 248)	**3.096 (0.0168)**	**2.783 (0.0227)**
Day 1: 4 hours (n = 514, 247)	**3.064 (0.0161)**	**2.760 (0.0217)**
Day 1: 23 hours 15 min (n = 499, 244)	**2.895 (0.0169)**	**2.693 (0.0221)**
Day 1: 23 hours 45 min (n = 498, 244)	**2.907 (0.0169)**	**2.718 (0.0219)**
Week 26: Pre-dose trough (n = 447, 208)	**2.827 (0.0238)**	**2.623 (0.0305)**
Week 26: -45 min (n = 447, 208)	**2.859 (0.0271)**	**2.658 (0.0337)**
Week 26: -15 min (n = 443, 205)	**2.798 (0.0235)**	**2.589 (0.0306)**
Week 26: 5 min (n = 439, 208)	**2.891 (0.0251)**	**2.639 (0.0318)**
Week 26: 15 min (n = 435, 205)	**2.895 (0.0240)**	**2.660 (0.0309)**
Week 26: 30 min (n = 440, 207)	**2.885 (0.0239)**	**2.603 (0.0310)**
Week 26: 1 hour (n = 438, 206)	**2.938 (0.0256)**	**2.625 (0.0329)**
Week 26: 2 hours (n = 438, 203)	**2.977 (0.0225)**	**2.687 (0.0302)**
Week 26: 3 hours (n = 439, 204)	**3.016 (0.0270)**	**2.742 (0.0345)**
Week 26: 4 hours (n = 438, 205)	**2.962 (0.0225)**	**2.709 (0.0303)**
Week 26: 23 hours 15 min (n = 434, 206)	**2.884 (0.0257)**	**2.673 (0.0322)**
Week 26: 23 hours 45 min (n = 434, 206)	**2.859 (0.0234)**	**2.669 (0.0306)**

No statistical analysis provided for Forced Vital Capacity (FVC) at Each Time-point on Day 1 and Week 26

8. Secondary: FEV1 Area Under the Curve (AUC) (5 Min - 12 Hour) at Day 1, Week 12 and Week 26 [Time Frame: Day 1, Week 12 and Week 26]

Measure Type	Secondary
Measure Title	FEV1 Area Under the Curve (AUC) (5 Min - 12 Hour) at Day 1, Week 12 and Week 26

Measure Description	The standardized (with respect to the length of time) area under the curve (AUC) for FEV1 was calculated using trapezoidal rule between 5 min and 12 h post dose at Week 1 Day 1, Week 12 and Week 26 for every patient in the serial spirometry subgroup. Mixed model used baseline FEV1,baseline inhaled corticosteroid (ICS) use, FEV1 prior to inhalation of short acting beta-agonist (SABA), and FEV1 45 minutes post-inhalation of SABA as covariates.
Time Frame	Day 1, Week 12 and Week 26
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
Serial spirometry group, a sub-set of the full analysis set of patients. Twelve hour serial spirometry was conducted in this subset of patients in selected centers at Day 1. At week 12/13 and week 26/27 a 24 hour serial spirometry was performed. "n" is the number of patients with non-missing observations at each time point.

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	**Placebo**
Number of Participants Analyzed [units: participants]	**169**	**83**
FEV1 Area Under the Curve (AUC) (5 Min - 12 Hour) at Day 1, Week 12 and Week 26 [units: Liters] Least Squares Mean (Standard Error)		

Day 1 (n = 169, 83)	**1.475 (0.0129)**	**1.320 (0.0173)**
Week 12 (n = 153, 75)	**1.433 (0.0179)**	**1.284 (0.0244)**
Week 26 (n = 149, 70)	**1.445 (0.0199)**	**1.238 (0.0274)**

No statistical analysis provided for FEV1 Area Under the Curve (AUC) (5 Min - 12 Hour) at Day 1, Week 12 and Week 26

9. Secondary: FEV1 Area Under Curve (AUC) (5 Min - 23 Hour 45 Min) at Week 12 and Week 26 [Time Frame: Week 12 and Week 26]

Measure Type	Secondary
Measure Title	FEV1 Area Under Curve (AUC) (5 Min - 23 Hour 45 Min) at Week 12 and Week 26
Measure Description	The standardized (with respect to the length of time) area under the curve (AUC) for FEV1 was calculated using trapezoidal rule between 5 min and 23 h 45 min post dose at week12/week 13and week 26/week 27 where available for every patient in the serial spirometry subgroup. Mixed model used baseline FEV1,baseline inhaled corticosteroid (ICS) use, FEV1 prior to inhalation of short acting beta-agonist (SABA), and FEV1 45 minutes post-inhalation of SABA as covariates.
Time Frame	Week 12 and Week 26
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
Serial spirometry group, a sub-set of the full analysis set of patients. Twelve hour serial spirometry was conducted in this subset of patients in selected centers at Day 1. At week 12/13 and week 26/27 a 24 hour serial spirometry was performed.

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all

	patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	Placebo
Number of Participants Analyzed [units: participants]	**169**	**83**
FEV1 Area Under Curve (AUC) (5 Min - 23 Hour 45 Min) at Week 12 and Week 26 [units: Liters] Least Squares Mean (Standard Error)		
Week 12 (n = 153, 75)	**1.401 (0.0167)**	**1.268 (0.0228)**
Week 26 (n = 149, 70)	**1.412 (0.0185)**	**1.213 (0.0254)**

No statistical analysis provided for FEV1 Area Under Curve (AUC) (5 Min - 23 Hour 45 Min) at Week 12 and Week 26

10. Secondary: Trough FEV1 and FVC at Day 1 and Week 26 [Time Frame: Day 1 and Week 26]

Measure Type	Secondary
Measure Title	Trough FEV1 and FVC at Day 1 and Week 26
Measure Description	Spirometry was conducted according to internationally accepted standards. Trough FEV1 was defined as the average of the 23 hour 15 minute and 23 hour 45 minute post-dose FEV1 readings. Mixed model used baseline FEV1, baseline ICS use, FEV1 prior to inhalation of SABA, and FEV1 45 minutes post-inhalation of SABA as covariates. Trough FVC was defined as the average of the 23 hour 15 minute and 23 hour 45 minute post-dose FVC readings. Mixed model used baseline FVC, baseline ICS use, FEV1 prior to inhalation of SABA, and FEV1 45 minutes post-inhalation of SABA as covariates.

Time Frame	Day 1 and Week 26
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
Full Analysis Set (FAS) included all randomized patients who received at least one dose of study medication. If one of the 23 h 15 min or 23 h 45 min values are missing then the remaining non-missing value is taken as trough FEV1 or trough FVC. If both values are missing, then their trough FEV1 or trough FVC is regarded as missing

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	**Placebo**
Number of Participants Analyzed [units: participants]	**534**	**260**
Trough FEV1 and FVC at Day 1 and Week 26 [units: Liters] Least Squares Mean (Standard Error)		
Day 1: FEV1 (n = 508, 248)	**1.414 (0.0075)**	**1.309 (0.0099)**
Week 26: FEV1 (n = 461, 217)	**1.387 (0.0112)**	**1.275 (0.0150)**
Day 1: FVC (n = 508, 248)	**2.901 (0.0154)**	**2.705 (0.0202)**

Week 26: FVC (n = 438, 208)	**2.867 (0.0236)**	**2.668 (0.0300)**

No statistical analysis provided for Trough FEV1 and FVC at Day 1 and Week 26

11. Secondary: Change in 24-hourly Mean Heart Rate at Day 1, Week 12 and Week 26 [Time Frame: Baseline, Day 1, Week 12 and Week 26]

Measure Type	Secondary
Measure Title	Change in 24-hourly Mean Heart Rate at Day 1, Week 12 and Week 26
Measure Description	The mean heart rate was collected with a 24 hour Holter monitor in a sub-set of the safety population. The change between baseline and day 1, week 12 and week 26 was calculated. The analysis of the Holter recordings was performed by a central facility. Data on heart rate, heart rate variability, supraventricular and ventricular ectopy were collected and assessed.
Time Frame	Baseline, Day 1, Week 12 and Week 26
Safety Issue	Yes

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
The safety set included all patients who received at least one dose of study medication whether or not being randomized. A sub-set of the safety population had 24 hour Holter monitoring. "n" indicates patients with observations both at baseline and each endpoint.

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist

	(salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	Placebo
Number of Participants Analyzed [units: participants]	**42**	**23**
Change in 24-hourly Mean Heart Rate at Day 1, Week 12 and Week 26 [units: beats per minute] Mean (Standard Deviation)		
Day 1: (n = 42, 23)	**-1.77 (7.583)**	**-1.28 (8.676)**
Week 12: (n = 42, 20)	**-1.99 (7.489)**	**-1.70 (7.230)**
Week 26: (n = 37, 22)	**-4.40 (9.347)**	**-2.60 (9.349)**

No statistical analysis provided for Change in 24-hourly Mean Heart Rate at Day 1, Week 12 and Week 26

12. Secondary: Number of Participants With Adverse Events, Death, and Serious or Clinically Significant Adverse Events or Related Discontinuations [Time Frame: 26 Weeks and 30 Day follow-up]

Measure Type	Secondary
Measure Title	Number of Participants With Adverse Events, Death, and Serious or Clinically Significant Adverse Events or Related Discontinuations
Measure Description	Adverse events are defined as any unfavorable and unintended diagnosis, symptom, sign (including an abnormal laboratory finding), syndrome or disease which either occurs during study, having been absent at baseline, or, if present at baseline, appears to worsen. Serious adverse events are any untoward medical occurrences that result in death, are life threatening, require (or prolong) hospitalization, cause persistent or significant disability/incapacity, result in congenital anomalies or birth defects, or are other conditions which in judgment of investigators represent significant hazards.
Time Frame	26 Weeks and 30 Day follow-up

Safety Issue	Yes

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
The safety set included all patients who received at least one dose of study medication whether or not being randomized. Patients were randomized according to the treatment they received.

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	Placebo
Number of Participants Analyzed [units: participants]	**550**	**267**
Number of Participants With Adverse Events, Death, and Serious or Clinically Significant Adverse Events or Related Discontinuations [units: participants]		
Participants with at least one AE	**317**	**174**
Death	**3**	**3**
SAE(s)	**41**	**24**
Discontinuation due to AE(s)	**32**	**19**

Discontinuation due to SAE(s)	**15**	**8**
Discontinuation due to non-SAE(s)	**18**	**11**
AE leading to dose interruption	**12**	**8**
AE requiring significant additional therapy	**246**	**155**
AE leading to new or prolonged hospitalization	**35**	**21**

No statistical analysis provided for Number of Participants With Adverse Events, Death, and Serious or Clinically Significant Adverse Events or Related Discontinuations

13. Secondary: Rate of Moderate or Severe COPD Exacerbations Over the 26 Week Treatment Period [Time Frame: 26 weeks]

Measure Type	Secondary
Measure Title	Rate of Moderate or Severe COPD Exacerbations Over the 26 Week Treatment Period
Measure Description	One overall rate is calculated for the entire study population. Rate is the number of moderate or severe exacerbations per year = total number of moderate or severe exacerbations for all participants/total number of treatment years for all participants. COPD exacerbations were considered to be moderate if treatment with systemic corticosteroids and/or antibiotics was required. COPD exacerbations were considered to be severe if treatment for moderate severity and hospitalization were required.
Time Frame	26 weeks
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
Full Analysis Set (FAS) included all randomized patients who received at least one dose of study medication.

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	Placebo
Number of Participants Analyzed [units: participants]	**534**	**260**
Rate of Moderate or Severe COPD Exacerbations Over the 26 Week Treatment Period [units: exacerbations per year]	**0.43**	**0.59**

No statistical analysis provided for Rate of Moderate or Severe COPD Exacerbations Over the 26 Week Treatment Period

14. Secondary: Percentage of Nights With no Nighttime Awakenings Over the 26 Week Treatment Period [Time Frame: 26 Weeks]

Measure Type	Secondary
Measure Title	Percentage of Nights With no Nighttime Awakenings Over the 26 Week Treatment Period
Measure Description	The percentage of nights with no nighttime awakenings is defined as the total number of nights with no nighttime awakenings over the 26 week treatment period divided by the total number of night where diary recordings have been made. Mixed model used baseline nighttime awakenings, baseline ICS use, FEV1 prior to inhalation of SABA, and FEV1 45 minutes post-inhalation of SABA as covariates.
Time Frame	26 Weeks
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
Full Analysis Set (FAS) included all randomized patients who received at least one dose of study medication. At 26 weeks, the analysis is based on only patients with a value at both baseline and post-baseline.

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	**Placebo**
Number of Participants Analyzed [units: participants]	**527**	**258**
Percentage of Nights With no Nighttime Awakenings Over the 26 Week Treatment Period [units: percentage of nights with no awakenings] Least Squares Mean (Standard Error)	**55.96 (1.537)**	**54.37 (1.970)**

No statistical analysis provided for Percentage of Nights With no Nighttime Awakenings Over the 26 Week Treatment Period

15. Secondary: Percentage of Days With no Daytime Symptoms Over the 26 Week Treatment Period [Time Frame: 26 Weeks]

Measure Type	Secondary

Measure Title	Percentage of Days With no Daytime Symptoms Over the 26 Week Treatment Period
Measure Description	The percentage of days with no daytime symptoms is defined as the total number of days with no daytime symptoms over the 26 week treatment period divided by the total number of days where diary recordings have been made. Mixed model used baseline daytime symptoms, baseline ICS use, FEV1 prior to inhalation of SABA, and FEV1 45 minutes post-inhalation of SABA as covariates.
Time Frame	26 Weeks
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
Full Analysis Set (FAS) included all randomized patients who received at least one dose of study medication. At 26 weeks, the analysis is based on only patients with a value at both baseline and post-baseline.

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	**Placebo**
Number of Participants Analyzed **[units: participants]**	**528**	**258**
Percentage of Days With no Daytime Symptoms Over the 26 Week Treatment Period **[units: percentage of days with no symptoms]** **Least Squares Mean (Standard Error)**	**5.70 (0.799)**	**5.78 (1.076)**

No statistical analysis provided for Percentage of Days With no Daytime Symptoms Over the 26 Week Treatment Period

16. Secondary: Percentage of Days Able to Perform Usual Daily Activities Over the 26 Week Treatment Period [Time Frame: 26 Weeks]

Measure Type	Secondary
Measure Title	Percentage of Days Able to Perform Usual Daily Activities Over the 26 Week Treatment Period
Measure Description	The percentage of days able to perform usual daily activities is defined as the total number of days able to perform usual activities over the 26 week treatment period divided by the total number of days where diary recordings have been made. Mixed model used baseline ability to perform usual daily activities, baseline ICS use, FEV1 prior to inhalation of SABA, and FEV1 45 minutes post-inhalation of SABA as covariates.
Time Frame	26 Weeks
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
Full Analysis Set (FAS) included all randomized patients who received at least one dose of study medication. At 26 weeks, the analysis is based on only patients with a value at both baseline and post-baseline.

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist

	(salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	Placebo
Number of Participants Analyzed [units: participants]	**528**	**258**
Percentage of Days Able to Perform Usual Daily Activities Over the 26 Week Treatment Period [units: percentage of days] Least Squares Mean (Standard Error)	**40.31 (1.473)**	**35.19 (1.907)**

No statistical analysis provided for Percentage of Days Able to Perform Usual Daily Activities Over the 26 Week Treatment Period

17. Secondary: Mean Daily Total Symptom Score Over the 26 Week Treatment Period [Time Frame: 26 Weeks]

Measure Type	Secondary
Measure Title	Mean Daily Total Symptom Score Over the 26 Week Treatment Period
Measure Description	The daily symptom score was calculated as the sum of the worst of the morning and evening assessments for each symptom (symptoms, cough, wheeze, sputum color/production, and breathlessness). The score can range from 0 to 18 with 0 indicating no symptoms. The higher the score, the worse the symptomatic status. A negative change (lower number) indicates improvement. Mixed model used baseline symptom variables, baseline inhaled corticosteroid (ICS) use, FEV1 prior to inhalation of short acting beta-agonist (SABA), and FEV1 45 minutes post-inhalation of SABA as covariates.
Time Frame	26 Weeks
Safety Issue	No

Population Description

Explanation of how the number of participants for analysis was determined. Includes whether analysis was per protocol, intention to treat, or another method. Also provides relevant details such as imputation technique, as appropriate.
Full Analysis Set (FAS) included all randomized patients who received at least one dose of study medication.

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Measured Values

	Glycopyrronium Bromide	**Placebo**
Number of Participants Analyzed [units: participants]	**534**	**260**
Mean Daily Total Symptom Score Over the 26 Week Treatment Period [units: units on a scale] Least Squares Mean (Standard Error)	**-1.54 (0.097)**	**-1.18 (0.129)**

No statistical analysis provided for Mean Daily Total Symptom Score Over the 26 Week Treatment Period

Serious Adverse Events

Hide Serious Adverse Events

Time Frame	No text entered.
Additional Description	No text entered.

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Serious Adverse Events

	Glycopyrronium Bromide	Placebo
Total, serious adverse events		
# participants affected / at risk	**41/550 (7.45%)**	**24/267 (8.99%)**
Blood and lymphatic system disorders		
Anaemia † [1]		
# participants affected / at risk	**0/550 (0.00%)**	**1/267 (0.37%)**
Cardiac disorders		
Atrial fibrillation † [1]		
# participants affected / at risk	**3/550 (0.55%)**	**0/267 (0.00%)**
Bradycardia † [1]		
# participants affected / at risk	**1/550 (0.18%)**	**0/267 (0.00%)**
Cardiac arrest † [1]		
# participants affected / at risk	**0/550 (0.00%)**	**1/267 (0.37%)**
Cardiac failure congestive † [1]		
# participants affected / at risk	**2/550 (0.36%)**	**0/267 (0.00%)**
Myocardial infarction † [1]		

# participants affected / at risk	2/550 (0.36%)	1/267 (0.37%)
Myocardial ischaemia † [1]		
# participants affected / at risk	0/550 (0.00%)	2/267 (0.75%)
Eye disorders		
Cataract † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Gastrointestinal disorders		
Abdominal pain † [1]		
# participants affected / at risk	0/550 (0.00%)	1/267 (0.37%)
Colonic polyp † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Diverticulum intestinal haemorrhagic † [1]		
# participants affected / at risk	0/550 (0.00%)	1/267 (0.37%)
Dyspepsia † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Gastric ulcer † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Upper gastrointestinal haemorrhage † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Vomiting † [1]		
# participants affected / at risk	0/550 (0.00%)	1/267 (0.37%)
General disorders		
Death † [1]		
# participants affected / at risk	0/550 (0.00%)	1/267 (0.37%)
Pyrexia † [1]		

# participants affected / at risk	0/550 (0.00%)	1/267 (0.37%)
Hepatobiliary disorders		
Hepatic cirrhosis † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Infections and infestations		
Lower respiratory tract infection bacterial † [1]		
# participants affected / at risk	0/550 (0.00%)	1/267 (0.37%)
Pneumonia † [1]		
# participants affected / at risk	4/550 (0.73%)	2/267 (0.75%)
Respiratory tract infection † [1]		
# participants affected / at risk	0/550 (0.00%)	1/267 (0.37%)
Tracheobronchitis † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Upper respiratory tract infection † [1]		
# participants affected / at risk	0/550 (0.00%)	2/267 (0.75%)
Upper respiratory tract infection bacterial † [1]		
# participants affected / at risk	3/550 (0.55%)	2/267 (0.75%)
Urinary tract infection bacterial † [1]		
# participants affected / at risk	0/550 (0.00%)	1/267 (0.37%)
Injury, poisoning and procedural complications		
Fall † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Pelvic fracture † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Rib fracture † [1]		

# participants affected / at risk	1/550 (0.18%)	1/267 (0.37%)
Spinal compression fracture † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Traumatic brain injury † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Metabolism and nutrition disorders		
Dehydration † [1]		
# participants affected / at risk	0/550 (0.00%)	1/267 (0.37%)
Type 2 diabetes mellitus † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Musculoskeletal and connective tissue disorders		
Intervertebral disc protrusion † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Neoplasms benign, malignant and unspecified (incl cysts and polyps)		
Bladder neoplasm † [1]		
# participants affected / at risk	0/550 (0.00%)	1/267 (0.37%)
Hepatic neoplasm malignant † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Lipoma † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Lung neoplasm † [1]		
# participants affected / at risk	2/550 (0.36%)	0/267 (0.00%)
Lung neoplasm malignant † [1]		
# participants affected / at risk	1/550 (0.18%)	1/267 (0.37%)
Metastasis † [1]		

# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Non-Hodgkin's lymphoma † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Squamous cell carcinoma of skin † [1]		
# participants affected / at risk	0/550 (0.00%)	1/267 (0.37%)
Thyroid cancer † [1]		
# participants affected / at risk	0/550 (0.00%)	1/267 (0.37%)
Nervous system disorders		
Cerebrovascular accident † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Syncope † [1]		
# participants affected / at risk	2/550 (0.36%)	0/267 (0.00%)
Psychiatric disorders		
Confusional state † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Depression † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Suicidal ideation † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Renal and urinary disorders		
Haematuria † [1]		
# participants affected / at risk	0/550 (0.00%)	1/267 (0.37%)
Renal failure acute † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Urinary retention † [1]		

# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Reproductive system and breast disorders		
Prostatomegaly † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Respiratory, thoracic and mediastinal disorders		
Acute respiratory failure † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Atelectasis † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Chronic obstructive pulmonary disease † [1]		
# participants affected / at risk	9/550 (1.64%)	11/267 (4.12%)
Dyspnoea † [1]		
# participants affected / at risk	2/550 (0.36%)	0/267 (0.00%)
Hypoxia † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Pleural effusion † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Respiratory failure † [1]		
# participants affected / at risk	2/550 (0.36%)	0/267 (0.00%)
Skin and subcutaneous tissue disorders		
Dermatitis psoriasiform † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)
Vascular disorders		
Aortic stenosis † [1]		
# participants affected / at risk	1/550 (0.18%)	0/267 (0.00%)

Deep vein thrombosis † 1		
# participants affected / at risk	**1/550 (0.18%)**	**0/267 (0.00%)**

† Events were collected by systematic assessment
1 Term from vocabulary, MedDRA

Other Adverse Events

Hide Other Adverse Events

Time Frame	No text entered.
Additional Description	No text entered.

Frequency Threshold

Threshold above which other adverse events are reported	5%

Reporting Groups

	Description
Glycopyrronium Bromide	Glycopyrronium bromide 50µg delivered once daily via Single Dose Dry Powder Inhaler (SDDPI). At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.
Placebo	Placebo delivered once daily via SDDPI. At Visit 1 all patients were provided with a short acting β2-agonist (salbutamol/albuterol) which they were instructed to use throughout the study as rescue medication.

Other Adverse Events

	Glycopyrronium Bromide	Placebo
Total, other (not including serious) adverse events		
# participants affected / at risk	**132/550 (24.00%)**	**85/267 (31.84%)**

Infections and infestations		
Nasopharyngitis † 1		
# participants affected / at risk	**28/550 (5.09%)**	**21/267 (7.87%)**
Upper respiratory tract infection † 1		
# participants affected / at risk	**23/550 (4.18%)**	**20/267 (7.49%)**
Respiratory, thoracic and mediastinal disorders		
Chronic obstructive pulmonary disease † 1		
# participants affected / at risk	**105/550 (19.09%)**	**67/267 (25.09%)**

† Events were collected by systematic assessment
1 Term from vocabulary, MedDRA

Limitations and Caveats

Hide Limitations and Caveats

Limitations of the study, such as early termination leading to small numbers of participants analyzed and technical problems with measurement leading to unreliable or uninterpretable data
No text entered.

More Information

Hide More Information

Certain Agreements:

Principal Investigators are **NOT** employed by the organization sponsoring the study.
There **IS** an agreement between Principal Investigators and the Sponsor (or its agents) that restricts the PI's rights to discuss or publish trial results after the trial is completed.
The agreement is:

☐ The only disclosure restriction on the PI is that the sponsor can review results communications prior to public release and can embargo communications regarding trial results for a period that is **less than or equal to 60 days**. The sponsor cannot require changes to the communication and cannot extend the embargo.

☐ The only disclosure restriction on the PI is that the sponsor can review results communications prior to public release and can embargo communications regarding trial results for a period that is **more than 60 days but less than or equal to 180 days**. The sponsor cannot require changes to the communication and cannot extend the embargo.

Other disclosure agreement that restricts the right of the PI to discuss or publish trial results after the trial is completed.

☑ **Restriction Description:** The terms and conditions of Novartis' agreements with its investigators may vary. However, Novartis does not prohibit any investigator from publishing. Any publications from a single-site are postponed until the publication of the pooled data (i.e., data from all sites) in the clinical trial.

Results Point of Contact:

Name/Title: Study Director
Organization: Novartis Pharmaceuticals
phone: 862-778-8300

Publications of Results:

D'Urzo A, Ferguson GT, van Noord JA, Hirata K, Martin C, Horton R, Lu Y, Banerji D, Overend T. Efficacy and safety of once-daily NVA237 in patients with moderate-to-severe COPD: the GLOW1 trial. Respir Res. 2011 Dec 7;12:156. doi: 10.1186/1465-9921-12-156.

Publications automatically indexed to this study:

D'Urzo A, Kerwin E, Overend T, D'Andrea P, Chen H, Goyal P. Once daily glycopyrronium for the treatment of COPD: pooled analysis of the GLOW1 and GLOW2 studies. Curr Med Res Opin. 2014 Mar;30(3):493-508. doi: 10.1185/03007995.2013.858618. Epub 2013 Nov 19.

Responsible Party:	Novartis
ClinicalTrials.gov Identifier:	NCT01005901 History of Changes
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Study First Received:	October 30, 2009
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Last Updated:	March 15, 2012
Health Authority:	United States: Food and Drug Administration Singapore: Health Sciences Authority Spain: Spanish Agency of Medicines Canada: Health Canada Australia: Department of Health and Ageing Therapeutic Goods Administration Turkey: Ministry of Health of Turkey General Directorate of Pharmaceuticals and Pharmacy Netherlands: The Central Committee on Research Involving Human Subjects (CCMO) Argentina: Administracion Nacional de Medicamentos, Alimentos y Tecnologia Medica South Korea: Korea Food and Drug Administration (KFDA) Russia: Ministry of Health of the Russian Federation India: Drugs Controller General of India Romania: National Medicines Agency Japan: Pharmaceuticals and Medical Devices Agency