Clinical trial results:
A randomised, double-blind, double-dummy, 4-week treatment, parallel-group study to evaluate the efficacy and safety of two doses of mometasone furoate delivered via Concept1 or Twisthaler® in adult and adolescent patients with persistent asthma

Summary

EudraCT number	2011-005100-14
Trial protocol	HU SK EE LT NL LV DE BE
Global end of trial date	02 July 2013

Results information

Result version number	v1 (current)
This version publication date	13 July 2016
First version publication date	17 July 2015

Trial information

Trial identification

Sponsor protocol code	CQMF149E2201

Additional study identifiers

ISRCTN number	-
ClinicalTrials.gov id (NCT number)	NCT01555151
WHO universal trial number (UTN)	-

Notes:

Sponsors

Sponsor organisation name	Novartis Pharma AG
Sponsor organisation address	CH-4002, Basel, Switzerland,
Public contact	Clinical Disclosure Office, Novartis Pharma AG, +41 613241111,
Scientific contact	Clinical Disclosure Office, Novartis Pharma AG, +41 613241111,

Notes:

Paediatric regulatory details

Is trial part of an agreed paediatric investigation plan (PIP)	Yes
EMA paediatric investigation plan number(s)	EMEA-001217-PIP01-11
Does article 45 of REGULATION (EC) No 1901/2006 apply to this trial?	No
Does article 46 of REGULATION (EC) No 1901/2006 apply to this trial?	Yes

Notes:

Results analysis stage

Analysis stage	Final
Date of interim/final analysis	02 July 2013
Is this the analysis of the primary completion data?	No

Global end of trial reached?	Yes
Global end of trial date	02 July 2013
Was the trial ended prematurely?	No

Notes:

General information about the trial

Main objective of the trial:

The main objective of the study was to evaluate the efficacy of two different doses (80 micrograms [mcg] and 320 mcg) of Mometasone furoate (MF) delivered via a single dose dry powder inhaler (Concept 1) compared to 200 mcg and 800 mcg of MF delivered via multidose dry powder inhaler device (Twisthaler) during treatment period of 28 days.

Protection of trial subjects:

The study was in compliance with the ethical principles derived from the Declaration of Helsinki and in compliance with all International Conference on Harmonization (ICH) Good Clinical Practice (GCP) Guidelines. All the local regulatory requirements pertinent to safety of trial subjects were followed. In addition, all subjects enrolled in the trial were supplied with an inhaled SABA (Salbutamol/Albuterol) as rescue medication.

Background therapy: -

Evidence for comparator: -

Actual start date of recruitment	30 July 2012
Long term follow-up planned	No
Independent data monitoring committee (IDMC) involvement?	No

Notes:

Population of trial subjects

Subjects enrolled per country

Country: Number of subjects enrolled	Belgium: 4
Country: Number of subjects enrolled	Japan: 74
Country: Number of subjects enrolled	India: 46
Country: Number of subjects enrolled	Malaysia: 5
Country: Number of subjects enrolled	Thailand: 27
Country: Number of subjects enrolled	Estonia: 9
Country: Number of subjects enrolled	Lithuania: 24
Country: Number of subjects enrolled	Latvia: 19
Country: Number of subjects enrolled	Poland: 49
Country: Number of subjects enrolled	Russian Federation: 40
Country: Number of subjects enrolled	Ukraine: 90
Country: Number of subjects enrolled	Canada: 13
Country: Number of subjects enrolled	Germany: 60
Country: Number of subjects enrolled	Netherlands: 4
Country: Number of subjects enrolled	Hungary: 180
Country: Number of subjects enrolled	Slovakia: 88
Country: Number of subjects enrolled	Turkey: 7

Worldwide total number of subjects	739
EEA total number of subjects	437

Notes:

Subjects enrolled per age group

In utero	0
Preterm newborn - gestational age < 37 wk	0
Newborns (0-27 days)	0
Infants and toddlers (28 days-23 months)	0
Children (2-11 years)	0
Adolescents (12-17 years)	73
Adults (18-64 years)	595
From 65 to 84 years	71
85 years and over	0

Subject disposition

Recruitment

Recruitment details:

The study was conducted at 141 centres in 17 countries.

Pre-assignment

Screening details:

A total of 1621 subjects were screened for the study, out of which 739 subjects completed the screening while 882 discontinued the study during the screening phase.

Period 1

Period 1 title	Overall Study (overall period)
Is this the baseline period?	Yes
Allocation method	Randomised - controlled
Blinding used	Double blind
Roles blinded	Subject, Investigator, Data analyst, Assessor

Blinding implementation details:

A double-dummy design was used because the identity of the study drugs could not be disguised due to their different forms. Unblinding was allowed only in case of subjects emergencies and at the conclusion of the study.

Arms

Are arms mutually exclusive?	Yes
Arm title	Mometasone Furoate 80 mcg via the Concept1 Device

Arm description:

MF delivered via Concept1, 80 mcg once daily (o.d.) in the evening

Arm type	Experimental
Investigational medicinal product name	Mometasone Furoate (Concept1)
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Inhalation powder, hard capsule
Routes of administration	Inhalation use

Dosage and administration details:

MF 80 mcg o.d. dose delivered via Concept1, plus placebo via Twisthaler

Arm title	Mometasone Furoate 200 mcg via the Twisthaler Device

Arm description:

MF delivered via Twisthaler, 200 mcg o.d. in the evening

Arm type	Active comparator
Investigational medicinal product name	Mometasone Furoate (Twisthaler)
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Inhalation powder
Routes of administration	Inhalation use

Dosage and administration details:

MF 200 mcg od dose delivered via Twisthaler , plus placebo via Concept1

Arm title	Mometasone Furoate 320 mcg via the Concept1 Device

Arm description:

MF delivered via Concept1, 320 mcg o.d. in the evening

Arm type	Experimental

Investigational medicinal product name	Mometasone Furoate (Concept1)
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Inhalation powder, hard capsule
Routes of administration	Inhalation use

Dosage and administration details:

MF 320 mcg o.d. delivered via Concept1, plus placebo via Twisthaler

Arm title	Mometasone Furoate 800 mcg via the Twisthaler Device

Arm description:

MF delivered via Twisthaler, 800 mcg o.d. in the evening

Arm type	Active comparator
Investigational medicinal product name	Mometasone Furoate (Twisthaler)
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Inhalation powder
Routes of administration	Inhalation use

Dosage and administration details:

MF 800 mcg o.d. dose delivered via Twisthaler, plus placebo via Concept1

Number of subjects in period 1	Mometasone Furoate 80 mcg via the Concept1 Device	Mometasone Furoate 200 mcg via the Twisthaler Device	Mometasone Furoate 320 mcg via the Concept1 Device
Started	188	181	184
Completed	175	173	178
Not completed	13	8	6
Consent withdrawn by subject	6	2	-
Adverse event, non-fatal	1	2	1
Administrative problem	3	1	2
Lost to follow-up	-	-	-
Protocol deviation	3	3	3

Number of subjects in period 1	Mometasone Furoate 800 mcg via the Twisthaler Device
Started	186
Completed	176
Not completed	10
Consent withdrawn by subject	2
Adverse event, non-fatal	2
Administrative problem	-
Lost to follow-up	1
Protocol deviation	5

Baseline characteristics

Reporting groups	
Reporting group title	Mometasone Furoate 80 mcg via the Concept1 Device
Reporting group description:	
MF delivered via Concept1, 80 mcg once daily (o.d.) in the evening	
Reporting group title	Mometasone Furoate 200 mcg via the Twisthaler Device
Reporting group description:	
MF delivered via Twisthaler, 200 mcg o.d. in the evening	
Reporting group title	Mometasone Furoate 320 mcg via the Concept1 Device
Reporting group description:	
MF delivered via Concept1, 320 mcg o.d. in the evening	
Reporting group title	Mometasone Furoate 800 mcg via the Twisthaler Device
Reporting group description:	
MF delivered via Twisthaler, 800 mcg o.d. in the evening	

Reporting group values	Mometasone Furoate 80 mcg via the Concept1 Device	Mometasone Furoate 200 mcg via the Twisthaler Device	Mometasone Furoate 320 mcg via the Concept1 Device
Number of subjects	188	181	184
Age categorical Units: Subjects			
Adolescents (12-17 years)	22	18	16
Adults (18-64 years)	148	148	146
Adults (65-<85 years)	18	15	22
Age continuous Units: years			
arithmetic mean	44.4	45.9	46
standard deviation	± 16.33	± 15.56	± 16.18
Gender categorical Units: Subjects			
Female	98	94	113
Male	90	87	71

Reporting group values	Mometasone Furoate 800 mcg via the Twisthaler Device	Total	
Number of subjects	186	739	
Age categorical Units: Subjects			
Adolescents (12-17 years)	17	73	
Adults (18-64 years)	153	595	
Adults (65-<85 years)	16	71	
Age continuous Units: years			
arithmetic mean	45.5		
standard deviation	± 16.57	-	
Gender categorical Units: Subjects			
Female	97	402	
Male	89	337	

End points

End points reporting groups

Reporting group title	Mometasone Furoate 80 mcg via the Concept1 Device
Reporting group description: MF delivered via Concept1, 80 mcg once daily (o.d.) in the evening	
Reporting group title	Mometasone Furoate 200 mcg via the Twisthaler Device
Reporting group description: MF delivered via Twisthaler, 200 mcg o.d. in the evening	
Reporting group title	Mometasone Furoate 320 mcg via the Concept1 Device
Reporting group description: MF delivered via Concept1, 320 mcg o.d. in the evening	
Reporting group title	Mometasone Furoate 800 mcg via the Twisthaler Device
Reporting group description: MF delivered via Twisthaler, 800 mcg o.d. in the evening	

Primary: Trough Forced Expiratory Volume in 1 Second (FEV1) at Day 29

End point title	Trough Forced Expiratory Volume in 1 Second (FEV1) at Day 29
End point description: FEV1 is the amount of air which can be forcibly exhaled from the lungs in the first second of a forced exhalation, measured through spirometry testing. The trough in FEV1 was defined as the mean of two measurements at 23 hour (hr) 15 minute (min) and 23hr 45min post dosing. The analysis was performed for Full Analysis Set (FAS), defined as all randomised subjects who received at least one dose of study drug.	
End point type	Primary
End point timeframe: Day 29	

End point values	Mometasone Furoate 80 mcg via the Concept1 Device	Mometasone Furoate 200 mcg via the Twisthaler Device	Mometasone Furoate 320 mcg via the Concept1 Device	Mometasone Furoate 800 mcg via the Twisthaler Device
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	171	165	172	173
Units: Liters				
least squares mean (standard error)	2.139 (± 0.0281)	2.071 (± 0.0283)	2.187 (± 0.0281)	2.162 (± 0.0279)

Statistical analyses

Statistical analysis title	Trough Forced Expiratory Volume in 1 Second (FEV1)
Comparison groups	Mometasone Furoate 80 mcg via the Concept1 Device v Mometasone Furoate 200 mcg via the Twisthaler Device

Number of subjects included in analysis	336
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	< 0.001
Method	Mixed models analysis
Parameter estimate	Least square mean
Point estimate	0.068
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0
Variability estimate	Standard error of the mean
Dispersion value	0.0349

Statistical analysis title	Trough Forced Expiratory Volume in 1 Second (FEV1)
Comparison groups	Mometasone Furoate 320 mcg via the Concept1 Device v Mometasone Furoate 800 mcg via the Twisthaler Device
Number of subjects included in analysis	345
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	< 0.001
Method	Mixed models analysis
Parameter estimate	Least square mean
Point estimate	0.025
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	-0.0427
Variability estimate	Standard error of the mean
Dispersion value	0.0342

Secondary: Trough Forced Expiratory Volume in 1 Second (FEV1) for dose discrimination at Day 29

End point title	Trough Forced Expiratory Volume in 1 Second (FEV1) for dose discrimination at Day 29

End point description:

FEV1 is the amount of air which can be forcibly exhaled from the lungs in the first second of a forced exhalation, measured through spirometry testing. The trough in FEV1 was defined as the mean of two measurements at 23hr 10min and 23hr 45min post dosing. Analysis was performed in FAS population.

End point type	Secondary

End point timeframe:

Day 29

End point values	Mometasone Furoate 80 mcg via the Concept1 Device	Mometasone Furoate 200 mcg via the Twisthaler Device	Mometasone Furoate 320 mcg via the Concept1 Device	Mometasone Furoate 800 mcg via the Twisthaler Device
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	171	165	172	173
Units: litre(s)				
least squares mean (standard error)	2.139 (± 0.0281)	2.071 (± 0.0283)	2.187 (± 0.0281)	2.162 (± 0.0279)

Statistical analyses

Statistical analysis title	FEV1 dose discrimination
Comparison groups	Mometasone Furoate 80 mcg via the Concept1 Device v Mometasone Furoate 320 mcg via the Concept1 Device
Number of subjects included in analysis	343
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.167
Method	Mixed models analysis
Parameter estimate	Least square mean
Point estimate	0.048
Confidence interval	
level	95 %
sides	2-sided
lower limit	-0.02
upper limit	0.1157
Variability estimate	Standard error of the mean
Dispersion value	0.0346

Statistical analysis title	FEV1 dose discrimination
Comparison groups	Mometasone Furoate 800 mcg via the Twisthaler Device v Mometasone Furoate 200 mcg via the Twisthaler Device
Number of subjects included in analysis	338
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.008
Method	Mixed models analysis
Parameter estimate	Least square mean
Point estimate	0.092
Confidence interval	
level	95 %
sides	2-sided
lower limit	0.0235
upper limit	0.1599
Variability estimate	Standard error of the mean
Dispersion value	0.0347

Secondary: Trough Forced Expiratory Volume in 1 Second (FEV1) at Day 8, 15 and 22 of treatment

End point title	Trough Forced Expiratory Volume in 1 Second (FEV1) at Day 8, 15 and 22 of treatment

End point description:

FEV1 is the amount of air which can be forcibly exhaled from the lungs in the first second of a forced exhalation, measured through spirometry testing. The trough in FEV1 was defined as the mean of two measurements at 23hr 10min and 23hr 45min post dosing. Analysis was performed in FAS population. The 'n' signifies those subjects evaluable for this measure at specified time points for each group, respectively.

End point type	Secondary

End point timeframe:

Days 8, 15 and 22

End point values	Mometasone Furoate 80 mcg via the Concept1 Device	Mometasone Furoate 200 mcg via the Twisthaler Device	Mometasone Furoate 320 mcg via the Concept1 Device	Mometasone Furoate 800 mcg via the Twisthaler Device
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	179	173	181	181
Units: litre(s)				
least squares mean (standard error)				
Day 8 (n=178,173,181,181)	2.069 (± 0.0252)	2.057 (± 0.0253)	2.113 (± 0.0251)	2.111 (± 0.025)
Day 15 (n=179,171,177,178)	2.095 (± 0.0254)	2.048 (± 0.0258)	2.134 (± 0.0257)	2.135 (± 0.0255)
Day 22 (n=174,170,177,177)	2.126 (± 0.0284)	2.071 (± 0.0286)	2.175 (± 0.0283)	2.146 (± 0.0282)

Statistical analyses

No statistical analyses for this end point

Secondary: Forced Vital Capacity (FVC)

End point title	Forced Vital Capacity (FVC)

End point description:

Forced Vital Capacity (FVC) is the amount of air that can be forcibly exhaled from the lungs after taking the deepest possible breath. Analysis was performed in FAS population. The 'n' signifies those subjects evaluable for this measure at specified time points for each group, respectively.

End point type	Secondary

End point timeframe:

Pre dose (50 min and 15 min) and post dose (30 min, 1 hr, 23 hr 10 min and 23 hr 45 min) at Day 1, 8, 15, 22, 28 and 29

End point values	Mometasone Furoate 80 mcg via the Concept1 Device	Mometasone Furoate 200 mcg via the Twisthaler Device	Mometasone Furoate 320 mcg via the Concept1 Device	Mometasone Furoate 800 mcg via the Twisthaler Device
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	178	172	179	175
Units: litre(s)				
least squares mean (standard error)				
Day 1/30 min post-dose (n=172,172,175,173)	2.892 (± 0.0208)	2.893 (± 0.0207)	2.861 (± 0.0209)	2.897 (± 0.0208)
Day 1/1 hr post-dose (n=178,169,174,175)	2.93 (± 0.0234)	2.913 (± 0.0234)	2.943 (± 0.0238)	2.946 (± 0.0235)
Day 8/50 min pre-dose (n=174,171,179,175)	3.111 (± 0.0325)	3.096 (± 0.0325)	3.134 (± 0.0321)	3.139 (± 0.0324)
Day 8/15 min pre-dose (n=176,172,179,174)	3.099 (± 0.0324)	3.074 (± 0.0324)	3.121 (± 0.0321)	3.125 (± 0.0323)
Day 15 /50 min pre-dose (n=176,169,170,169)	3.134 (± 0.0342)	3.09 (± 0.0347)	3.168 (± 0.0348)	3.155 (± 0.0348)
Day 15/15 min pre-dose (n=176,168,176,167)	3.709 (± 0.0343)	3.076 (± 0.0348)	3.137 (± 0.0345)	3.127 (± 0.0348)
Day 22/50 min pre-dose (n=172,167,174,169)	3.136 (± 0.0356)	3.091 (± 0.0359)	3.203 (± 0.0355)	3.152 (± 0.0357)
Day 22/15 min pre-dose (n=169,170,174,172)	3.134 (± 0.0365)	3.096 (± 0.0363)	3.198 (± 0.0362)	3.157 (± 0.0361)
Day 28/50 min pre-dose (n=172,168,176,172)	3.146 (± 0.0342)	3.115 (± 0.0345)	3.184 (± 0.034)	3.18 (± 0.0342)
Day 28/15 min pre-dose (n=170,165,174, 170)	3.135 (± 0.0345)	3.095 (± 0.0348)	3.153 (± 0.0343)	3.161 (± 0.0344)
Day 28/30 min post-dose (n=175,166,174,170)	3.132 (± 0.0341)	3.092 (± 0.0346)	3.151 (± 0.0343)	3.184 (± 0.0343)
Day 28/30 min post-dose (n=173,167,172,172)	3.14 (± 0.0351)	3.084 (± 0.0353)	3.158 (± 0.0353)	3.161 (± 0.035)
Day 29/23hr 10 min post-dose (n=173,162,172,168)	3.16 (± 0.0342)	3.113 (± 0.0348)	3.216 (± 0.0343)	3.194 (± 0.0344)
Day 29/23hr 45 min post-dose (n=172,161, 175,170)	3.165 (± 0.0355)	3.09 (± 0.0363)	3.192 (± 0.0353)	3.158 (± 0.0355)

Statistical analyses

No statistical analyses for this end point

Secondary: Forced Expiratory Flow Between 25% and 75% (FEF 25-75%)

End point title	Forced Expiratory Flow Between 25% and 75% (FEF 25-75%)

End point description:

FEF (25%-75%) measurement describes the amount of air expelled from the lungs during the middle half (25% - 75%) of the FVC test and is measured using spirometry. Analysis was performed in FAS population. The 'n' signifies those subjects evaluable for this measure at specified time points for each group, respectively.

End point type	Secondary

End point timeframe:

Pre dose (50 min and 15 min) and post dose (30 min, 1 hr, 23 hr 10 min and 23 hr 45 min) at Day 1, 8,

End point values	Mometasone Furoate 80 mcg via the Concept1 Device	Mometasone Furoate 200 mcg via the Twisthaler Device	Mometasone Furoate 320 mcg via the Concept1 Device	Mometasone Furoate 800 mcg via the Twisthaler Device
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	178	172	179	174
Units: litre(s) per second				
least squares mean (standard error)				
Day 1/30 min post-dose (n=172,172,175,172)	1.308 (± 0.0181)	1.3 (± 0.0182)	1.309 (± 0.0182)	1.308 (± 0.0182)
Day 1/1 hr post-dose (n=178,169,174,174)	1.337 (± 0.0197)	1.327 (± 0.0201)	1.316 (± 0.0201)	1.345 (± 0.0199)
Day 8/50 min pre-dose (n=173,171,179,174)	1.457 (± 0.0323)	1.449 (± 0.0322)	1.519 (± 0.0317)	1.525 (± 0.0321)
Day 8/15 min pre-dose (n=175,172,179,173)	1.458 (± 0.0329)	1.466 (± 0.0328)	1.542 (± 0.0325)	1.566 (± 0.0328)
Day 15 /50 min pre-dose (n=175,169,170,169)	1.509 (± 0.0317)	1.43 (± 0.0321)	1.514 (± 0.032)	1.544 (± 0.0321)
Day 15/15 min pre-dose (n=175,168,176,167)	1.494 (± 0.0322)	1.414 (± 0.0326)	1.52 (± 0.0321)	1.561 (± 0.0327)
Day 22/50 min pre-dose (n=171,167,174,169)	1.511 (± 0.035)	1.44 (± 0.0353)	1.565 (± 0.0348)	1.555 (± 0.0351)
Day 22/15 min pre-dose (n=168,170,174,172)	1.54 (± 0.0365)	1.476 (± 0.0362)	1.6 (± 0.0361)	1.591 (± 0.0361)
Day 28/50 min pre-dose (n=171,168,176,172)	1.504 (± 0.0353)	1.458 (± 0.0354)	1.581 (± 0.035)	1.598 (± 0.0351)
Day 28/15 min pre-dose (n=169,165,174, 170)	1.529 (± 0.0357)	1.481 (± 0.0359)	1.574 (± 0.0354)	1.584 (± 0.0355)
Day 28/30 min post-dose (n=175,166,174,170)	1.558 (± 0.0362)	1.457 (± 0.0368)	1.557 (± 0.0364)	1.615 (± 0.0364)
Day 28/30 min post-dose (n=172,167,172,172)	1.566 (± 0.0367)	1.46 (± 0.0369)	1.557 (± 0.0368)	1.593 (± 0.0365)
Day 29/23hr 10 min post-dose (n=172,162,172,168)	1.537 (± 0.0369)	1.451 (± 0.0376)	1.604 (± 0.0369)	1.584 (± 0.0371)
Day 29/23hr 45 min post-dose (n=171,161, 175,170)	1.55 (± 0.037)	1.438 (± 0.0378)	1.576 (± 0.0366)	1.571 (± 0.0369)

Statistical analyses

No statistical analyses for this end point

Secondary: Forced Expiratory Volume in 1 second (FEV1) as Percentage of Forced Vital Capacity (FVC)

End point title	Forced Expiratory Volume in 1 second (FEV1) as Percentage of Forced Vital Capacity (FVC)

End point description:

Percentage of FEV1 is calculated as (FEV1/FVC)*100. It signifies the percentage of the total amount of air exhaled from the lungs during the first second of forced exhalation. FEV1 is the maximal volume of air exhaled in the first second of a forced expiration from a position of full inspiration. FVC is the volume of air which can be forcibly exhaled from the lungs after taking the deepest breath possible. Analysis was performed in FAS population. The, 'n' signifies those subjects evaluable for this measure at specified

time points for each group.

End point type	Secondary

End point timeframe:

Pre dose (50 min and 15 min) and post dose (30 min, 1 hr, 23 hr 10 min and 23 hr 45 min) at Day 1, 8, 15, 22, 28 and 29

End point values	Mometasone Furoate 80 mcg via the Concept1 Device	Mometasone Furoate 200 mcg via the Twisthaler Device	Mometasone Furoate 320 mcg via the Concept1 Device	Mometasone Furoate 800 mcg via the Twisthaler Device
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	178	172	179	175
Units: percent				
least squares mean (standard error)				
Day 1/30 min post-dose (n=172,172,175,173)	65.043 (± 0.2548)	64.898 (± 0.2556)	65.184 (± 0.2559)	64.898 (± 0.2554)
Day 1/1 hr post-dose (n=178,169,174,175)	65.177 (± 0.2833)	64.833 (± 0.289)	65.005 (± 0.2885)	65.072 (± 0.2845)
Day 8/50 min pre-dose (n=174,171,179,175)	66.566 (± 0.4281)	66.301 (± 0.4286)	67.344 (± 0.4222)	66.568 (± 0.4264)
Day 8/15 min pre-dose (n=176,172,179,174)	66.595 (± 0.4259)	66.79 (± 0.4262)	67.778 (± 0.4224)	67.156 (± 0.4252)
Day 15 /50 min pre-dose (n=176,169,170,169)	67.007 (± 0.4329)	66.122 (± 0.4398)	67.487 (± 0.4395)	67.139 (± 0.4407)
Day 15/15 min pre-dose (n=176,168,176,167)	66.878 (± 0.437)	66.006 (± 0.4443)	67.607 (± 0.4384)	67.514 (± 0.4456)
Day 22/50 min pre-dose (n=172,167,174,169)	67.081 (± 0.4594)	66.567 (± 0.4643)	67.831 (± 0.4584)	67.742 (± 0.4615)
Day 22/15 min pre-dose (n=169,170,174,172)	67.403 (± 0.4657)	66.885 (± 0.4629)	68.143 (± 0.4622)	67.895 (± 0.4612)
Day 28/50 min pre-dose (n=172,168,176,172)	67.128 (± 0.4584)	66.835 (± 0.4615)	68.124 (± 0.4567)	67.81 (± 0.4578)
Day 28/15 min pre-dose (n=170,165,174, 170)	67.503 (± 0.4813)	67.296 (± 0.4854)	68.255 (± 0.4796)	67.878 (± 0.4804)
Day 28/30 min post-dose (n=175,166,174,170)	67.7 (± 0.4723)	67.013 (± 0.4796)	68.031 (± 0.4755)	68.126 (± 0.4755)
Day 28/30 min post-dose (n=173,167,172,172)	67.945 (± 0.4703)	66.832 (± 0.4741)	68.243 (± 0.4736)	68.057 (± 0.4698)
Day 29/23hr 10 min post-dose (n=173,162,172,168)	67.427 (± 0.4639)	66.711 (± 0.4736)	68.265 (± 0.4654)	67.592 (± 0.4676)
Day 29/23hr 45 min post-dose (n=172,161, 175,170)	67.63 (± 0.4694)	66.541 (± 0.4806)	67.961 (± 0.4667)	67.831 (± 0.4692)

Statistical analyses

No statistical analyses for this end point

Secondary: Change From Baseline in Morning and Evening Peak Expiratory Flow Rate (PEFR) at Day 28

End point title	Change From Baseline in Morning and Evening Peak Expiratory Flow Rate (PEFR) at Day 28

End point description:

The PEFR is a subject's maximum speed of expiration, as measured with a peak flow meter. Home peak flow testing for PEFR was performed every morning and evening. Analysis was performed in FAS population. The 'n' signifies those subjects evaluable for this measure at specified time points for each group, respectively.

End point type	Secondary

End point timeframe:

Baseline to Day 28

End point values	Mometasone Furoate 80 mcg via the Concept1 Device	Mometasone Furoate 200 mcg via the Twisthaler Device	Mometasone Furoate 320 mcg via the Concept1 Device	Mometasone Furoate 800 mcg via the Twisthaler Device
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	177	172	175	182
Units: litres per min				
least squares mean (standard error)				
Morning PEFR (n=177,171, 175, 182)	-4.952 (± 4.1929)	3.955 (± 4.2616)	2.785 (± 4.2349)	1.606 (± 4.1464)
Evening PEFR (n=176, 172, 174, 179)	1.354 (± 3.9003)	0.293 (± 3.9477)	-0.644 (± 3.9427)	6.287 (± 3.8826)

Statistical analyses

No statistical analyses for this end point

Secondary: Change From Baseline in Asthma Control Questionnaire (ACQ-5) at Day 8, 15, 22, and 29

End point title	Change From Baseline in Asthma Control Questionnaire (ACQ-5) at Day 8, 15, 22, and 29

End point description:

Asthma symptoms were evaluated by the Asthma Control Questionnaire (ACQ). The ACQ-5 is comprised of five questions of the asthma symptoms to be answered by the subject. The overall score is the average of the 5 questions; a minimum overall score of 0 (good control of asthma) whereas a maximum overall score of 6 (poor control of asthma). A negative change in score indicates improvement in asthma symptoms. Analysis was performed in FAS population. The 'n' signifies those subjects evaluable for this measure at specified time points for each group, respectively.

End point type	Secondary

End point timeframe:

Baseline to Day 8, 15, 22 and 29

End point values	Mometasone Furoate 80 mcg via the Concept1 Device	Mometasone Furoate 200 mcg via the Twisthaler Device	Mometasone Furoate 320 mcg via the Concept1 Device	Mometasone Furoate 800 mcg via the Twisthaler Device
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	180	176	182	182
Units: Units on a scale				
least squares mean (standard error)				
Change from baseline at day 8 (n=179,176,182,182)	-0.662 (± 0.0543)	-0.73 (± 0.0546)	-0.908 (± 0.054)	-0.89 (± 0.0538)
Change from baseline at day 15 (n=180,174,179,178)	-0.899 (± 0.059)	-0.908 (± 0.0599)	-1.117 (± 0.0595)	-0.973 (± 0.0593)
Change from baseline at day 22 (n=178,173,178,177)	-0.994 (± 0.062)	-0.982 (± 0.0628)	-1.262 (± 0.0622)	-1.097 (± 0.0622)
Change from baseline at day 29 (n=179,176,181,182)	-1.079 (± 0.063)	-1.109 (± 0.0635)	-1.329 (± 0.0632)	-1.162 (± 0.0625)

Statistical analyses

No statistical analyses for this end point

Secondary: Change From Baseline in Mean Daily Number of Puffs of Rescue Medication at Day 28

End point title	Change From Baseline in Mean Daily Number of Puffs of Rescue Medication at Day 28

End point description:

Mean daily number of puffs of rescue medication taken for the subject was derived from total number of puffs of rescue medication utilised per day over the 28 days treatment period divided by the total number of days with non-missing rescue medication data. Analysis was performed in FAS population.

End point type	Secondary

End point timeframe:

Baseline to Day 28

End point values	Mometasone Furoate 80 mcg via the Concept1 Device	Mometasone Furoate 200 mcg via the Twisthaler Device	Mometasone Furoate 320 mcg via the Concept1 Device	Mometasone Furoate 800 mcg via the Twisthaler Device
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	177	172	175	181
Units: Number of puffs				
least squares mean (standard error)	-0.456 (± 0.0972)	-0.391 (± 0.0985)	-0.6 (± 0.0981)	-0.677 (± 0.0963)

Statistical analyses

No statistical analyses for this end point

Secondary: Percentage of days with no use of rescue medication

End point title	Percentage of days with no use of rescue medication

End point description:

A day with no rescue use was defined as any day where the subject did not use any puffs of rescue medication. Percentage of days with no rescue use was derived from total number of days with no rescue use during 28 days treatment period divided by the total number of evaluable days.

End point type	Secondary

End point timeframe:

Day 28

End point values	Mometasone Furoate 80 mcg via the Concept1 Device	Mometasone Furoate 200 mcg via the Twisthaler Device	Mometasone Furoate 320 mcg via the Concept1 Device	Mometasone Furoate 800 mcg via the Twisthaler Device
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	124	116	117	113
Units: percentage days				
least squares mean (standard error)	74.148 (± 2.2576)	75.236 (± 2.3291)	75.157 (± 2.3044)	80.578 (± 2.3476)

Statistical analyses

No statistical analyses for this end point

Secondary: Fractional Exhaled Nitric Oxide (FeNO)

End point title	Fractional Exhaled Nitric Oxide (FeNO)

End point description:

FeNO is widely accepted as a non-invasive marker for airway inflammation in asthma. Analysis was performed in FAS population. The 'n' signifies those subjects evaluable for this measure at specified time points for each group, respectively.

End point type	Secondary

End point timeframe:

Day 15 and 29

End point values	Mometasone Furoate 80 mcg via the Concept1 Device	Mometasone Furoate 200 mcg via the Twisthaler Device	Mometasone Furoate 320 mcg via the Concept1 Device	Mometasone Furoate 800 mcg via the Twisthaler Device
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	142	143	145	150
Units: ppm				
arithmetic mean (standard error)				
Day 15 (n= 142, 139, 139, 149)	25.286 (± 1.2983)	26.762 (± 1.3201)	19.098 (± 1.3246)	21.017 (± 1.2911)

Day 29 (n=141, 143, 145, 150)	23.777 (± 1.3078)	27.055 (± 1.3035)	18.468 (± 1.2952)	19.981 (± 1.2803)

Statistical analyses

No statistical analyses for this end point

Secondary: Change from baseline in plasma cortisol concentrations at Day 1 and 28

End point title	Change from baseline in plasma cortisol concentrations at Day 1 and 28

End point description:

Plasma cortisol concentrations were determined from blood samples collected from the subjects. Analysis was performed on safety population which included all subjects who received at least one dose of the study drug. The 'n' signifies those participants evaluable for this measure at specified time points for each group, respectively.

End point type	Secondary

End point timeframe:

Baseline to post dose (1 hr) on Day 1 and 28

End point values	Mometasone Furoate 80 mcg via the Concept1 Device	Mometasone Furoate 200 mcg via the Twisthaler Device	Mometasone Furoate 320 mcg via the Concept1 Device	Mometasone Furoate 800 mcg via the Twisthaler Device
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	183	178	179	181
Units: nanomoles per litre (nmol/L)				
arithmetic mean (standard deviation)				
Day 1/1 Hr (n=179, 177,174, 176)	-32.238 (± 73.4482)	-34.491 (± 58.4396)	-36.109 (± 67.0512)	-34.454 (± 78.3966)
Day 28/1 Hr (n= 172, 168, 174, 170)	-43.135 (± 81.4675)	-35.947 (± 83.3223)	-38.779 (± 88.2388)	-41.097 (± 83.7467)

Statistical analyses

No statistical analyses for this end point

Adverse events

Adverse events information

Timeframe for reporting adverse events:

Adverse events are collected from First Patient First Visit (FPFV) until Last Patient Last Visit (LPLV). All adverse events reported in this record are from date of First Patient First Treatment until Last Patient Last Visit.

Assessment type	Systematic

Dictionary used

Dictionary name	MedDRA
Dictionary version	16.0

Reporting groups

Reporting group title	Mometasone Furoate 80 mcg via the Concept1 Device
Reporting group description:	
MF delivered via Concept1, 80 mcg once daily (o.d.) in the evening	
Reporting group title	Mometasone Furoate 200 mcg via the Twisthaler Device
Reporting group description:	
MF delivered via Twisthaler, 200 mcg o.d. in the evening	
Reporting group title	Mometasone Furoate 320 mcg via the Concept1 Device
Reporting group description:	
MF delivered via Concept1, 320 mcg o.d. in the evening	
Reporting group title	Mometasone Furoate 800 mcg via the Twisthaler device
Reporting group description:	
MF delivered via Twisthaler, 800 mcg o.d. in the evening	

Serious adverse events	Mometasone Furoate 80 mcg via the Concept1 Device	Mometasone Furoate 200 mcg via the Twisthaler Device	Mometasone Furoate 320 mcg via the Concept1 Device
Total subjects affected by serious adverse events			
subjects affected / exposed	0 / 186 (0.00%)	0 / 180 (0.00%)	1 / 183 (0.55%)
number of deaths (all causes)	0	0	0
number of deaths resulting from adverse events	0	0	0
Respiratory, thoracic and mediastinal disorders			
Asthma			
subjects affected / exposed	0 / 186 (0.00%)	0 / 180 (0.00%)	1 / 183 (0.55%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 1
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Infections and infestations			
Pneumonia			
subjects affected / exposed	0 / 186 (0.00%)	0 / 180 (0.00%)	1 / 183 (0.55%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 1
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0

Serious adverse events	Mometasone Furoate 800 mcg via the Twisthaler device		
Total subjects affected by serious adverse events			
subjects affected / exposed	0 / 186 (0.00%)		
number of deaths (all causes)	0		
number of deaths resulting from adverse events	0		
Respiratory, thoracic and mediastinal disorders			
Asthma			
subjects affected / exposed	0 / 186 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		
Infections and infestations			
Pneumonia			
subjects affected / exposed	0 / 186 (0.00%)		
occurrences causally related to treatment / all	0 / 0		
deaths causally related to treatment / all	0 / 0		

Frequency threshold for reporting non-serious adverse events: 2 %

Non-serious adverse events	Mometasone Furoate 80 mcg via the Concept1 Device	Mometasone Furoate 200 mcg via the Twisthaler Device	Mometasone Furoate 320 mcg via the Concept1 Device
Total subjects affected by non-serious adverse events			
subjects affected / exposed	13 / 186 (6.99%)	17 / 180 (9.44%)	15 / 183 (8.20%)
Investigations			
Blood cortisol decreased			
subjects affected / exposed	4 / 186 (2.15%)	3 / 180 (1.67%)	5 / 183 (2.73%)
occurrences (all)	4	3	5
Nervous system disorders			
Headache			
subjects affected / exposed	6 / 186 (3.23%)	5 / 180 (2.78%)	5 / 183 (2.73%)
occurrences (all)	8	5	6
Respiratory, thoracic and mediastinal disorders			
Oropharyngeal pain			
subjects affected / exposed	0 / 186 (0.00%)	4 / 180 (2.22%)	1 / 183 (0.55%)
occurrences (all)	0	4	1
Infections and infestations			

Nasopharyngitis subjects affected / exposed occurrences (all)	3 / 186 (1.61%) 3	7 / 180 (3.89%) 7	6 / 183 (3.28%) 6

Non-serious adverse events	Mometasone Furoate 800 mcg via the Twisthaler device		
Total subjects affected by non-serious adverse events subjects affected / exposed	8 / 186 (4.30%)		
Investigations Blood cortisol decreased subjects affected / exposed occurrences (all)	6 / 186 (3.23%) 7		
Nervous system disorders Headache subjects affected / exposed occurrences (all)	0 / 186 (0.00%) 0		
Respiratory, thoracic and mediastinal disorders Oropharyngeal pain subjects affected / exposed occurrences (all)	0 / 186 (0.00%) 0		
Infections and infestations Nasopharyngitis subjects affected / exposed occurrences (all)	2 / 186 (1.08%) 2		

More information

Substantial protocol amendments (globally)

Were there any global substantial amendments to the protocol? No

Interruptions (globally)

Were there any global interruptions to the trial? No

Limitations and caveats

None reported