Clinical trial results:
Comparative Prospective Randomized Study in Postoperative Cardiac Surgery Patients on Analgesia with Morphine Continuous Infusion or Sublingual Sufentanil (Zalviso®).

Summary

EudraCT number	2017-004038-28
Trial protocol	BE
Global end of trial date	06 August 2024

Results information

Result version number	v1 (current)
This version publication date	09 May 2025
First version publication date	09 May 2025

Trial information

Trial identification

Sponsor protocol code	Zalviso

Additional study identifiers

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

Notes:

Sponsors

Sponsor organisation name	UZ Brussel
Sponsor organisation address	Laarbeeklaan, Brussel, Belgium,
Public contact	Virgini Van Buggenhout, Universitair Ziekenhuis Brussel, +32 24776001, virgini.vanbuggenhout@uzbrussel.be
Scientific contact	Virgini Van Buggenhout, Universitair Ziekenhuis Brussel, +32 24776001, virgini.vanbuggenhout@uzbrussel.be

Notes:

Paediatric regulatory details

Is trial part of an agreed paediatric investigation plan (PIP)	No
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?	No

Notes:

Results analysis stage

Analysis stage	Final
Date of interim/final analysis	30 December 2019
Is this the analysis of the primary completion data?	No

Global end of trial reached?	Yes
Global end of trial date	06 August 2024
Was the trial ended prematurely?	No

Notes:

General information about the trial

Main objective of the trial:

The present study aims to assess postoperative pain after cardiac surgery by means of a standardized scoring system.

Protection of trial subjects:

Patients were followed up during the entire study after informed consent was given. This to assess safety of the IMP used.

Background therapy: -

Evidence for comparator: -

Actual start date of recruitment	15 November 2017
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: 80
Worldwide total number of subjects	80
EEA total number of subjects	80

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)	0
Adults (18-64 years)	59
From 65 to 84 years	21
85 years and over	0

Subject disposition

Recruitment

Recruitment details: -

Pre-assignment

Screening details: -

Pre-assignment period milestones

Number of subjects started	483[1]
Number of subjects completed	80

Pre-assignment subject non-completion reasons

Reason: Number of subjects	not meeting in- and exclusion criteria: 310
Reason: Number of subjects	not willing to give consent: 93

Notes:

[1] - The number of subjects reported to have started the pre-assignment period are not the same as the worldwide number enrolled in the trial. It is expected that these numbers will be the same.
Justification: 483 patients were scheduled for cardiac surgery between june 2018 and september 2019. However only 80 were eligible of those 483 patients.

Period 1

Period 1 title	study conduct (overall period)
Is this the baseline period?	Yes
Allocation method	Randomised - controlled
Blinding used	Not blinded

Arms

Are arms mutually exclusive?	Yes
Arm title	sublingual sufentanil tablet system

Arm description: -

Arm type	Experimental
Investigational medicinal product name	sufentanil
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Tablet
Routes of administration	Sublingual use

Dosage and administration details:

15-microgram sublingual sufentanil tablet with a 20-minute lag time between each dose

Arm title	continuous morphine pump

Arm description: -

Arm type	Active comparator
Investigational medicinal product name	morphine
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Solution for injection
Routes of administration	Intravenous use

Dosage and administration details:

continuous mrophine pump: 0.1 mg/kg/dose

Number of subjects in period 1	sublingual sufentanil tablet system	continuous morphine pump
Started	40	40
Completed	31	33
Not completed	9	7
Consent withdrawn by subject	2	-
Adverse event, non-fatal	3	3
Lost to follow-up	-	2
did not receive assigned treatment	4	2

Baseline characteristics

Reporting groups	
Reporting group title	sublingual sufentanil tablet system
Reporting group description: -	
Reporting group title	continuous morphine pump
Reporting group description: -	

Reporting group values	sublingual sufentanil tablet system	continuous morphine pump	Total
Number of subjects	40	40	80
Age categorical Units: Subjects			
In utero			0
Preterm newborn infants (gestational age < 37 wks)			0
Newborns (0-27 days)			0
Infants and toddlers (28 days-23 months)			0
Children (2-11 years)			0
Adolescents (12-17 years)			0
Adults (18-64 years)			0
From 65-84 years			0
85 years and over			0
Age continuous Units: years			
arithmetic mean	64.2	64	
standard deviation	± 7.2	± 10.9	-
Gender categorical Units: Subjects			
Female	5	8	13
Male	35	32	67
length Units: centimetre			
arithmetic mean	172.1	172.9	
standard deviation	± 6.8	± 8.6	-
weight Units: kilogram(s)			
arithmetic mean	84.9	80.7	
standard deviation	± 12.5	± 16.3	-
BMI Units: kilogram(s)/square metre			
arithmetic mean	28.7	26.9	
standard deviation	± 3.4	± 4.2	-
total dose of sufentanil Units: microgram(s)			
arithmetic mean	97.8	97.9	
standard deviation	± 55.8	± 39.4	-
duration until extubation after ICU arrival			

Units: hour			
arithmetic mean	5.3	5.1	
standard deviation	± 2.8	± 4.5	-

End points

End points reporting groups	
Reporting group title	sublingual sufentanil tablet system
Reporting group description: -	
Reporting group title	continuous morphine pump
Reporting group description: -	

Primary: cumulative pain score 24hrs after extubation	
End point title	cumulative pain score 24hrs after extubation
End point description:	
End point type	Primary
End point timeframe:	
24hrs after extubation	

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: pain score				
arithmetic mean (standard deviation)	1.3 (± 0.8)	0.8 (± 0.7)		

Statistical analyses

Statistical analysis title	chi square test
Comparison groups	continuous morphine pump v sublingual sufentanil tablet system
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Primary: cumulative pain score 48hrs after extubation	
End point title	cumulative pain score 48hrs after extubation
End point description:	
End point type	Primary

End point timeframe:
pain score 48 hours after extubation

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: pain score				
arithmetic mean (standard deviation)	0.6 (± 0.5)	0.2 (± 0.3)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Primary: cumulative pain score 63 hrs after extubation

End point title	cumulative pain score 63 hrs after extubation

End point description:

End point type	Primary

End point timeframe:
pain score 63 hours after extubation

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: pain score				
arithmetic mean (standard deviation)	0.1 (± 0.2)	0.0 (± 0.0)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Primary: pain score hour 4	
End point title	pain score hour 4
End point description:	

End point type	Primary
End point timeframe:	
pain score on hour 4 between extubation and discharge of ICU	

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: pain score				
arithmetic mean (standard deviation)	2.4 (± 1.8)	1.1 (± 1.9)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Primary: pain score hour 11	
End point title	pain score hour 11
End point description:	

End point type	Primary

End point timeframe:
pain score 11 hours after extubation and still in ICU

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: pain score				
arithmetic mean (standard deviation)	2.1 (± 2.1)	0.2 (± 0.6)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Primary: pain score hour 12

End point title	pain score hour 12

End point description:

End point type	Primary

End point timeframe:
pain score 12 hours after extubation and patient still on ICU

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: pain score				
arithmetic mean (standard deviation)	2.2 (± 2.2)	1.0 (± 1.8)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Primary: pain score hour 16

End point title	pain score hour 16

End point description:

End point type	Primary

End point timeframe:

pain score 16 hours after extubation and still on ICU

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: pain score				
arithmetic mean (standard deviation)	2.3 (± 2.2)	0.6 (± 1.0)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Primary: pain score hour 20

End point title	pain score hour 20

End point description:

End point type	Primary

End point timeframe:
pain score 20 hrs after extubation and still on ICU

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: pain score				
arithmetic mean (standard deviation)	1.6 (± 2.2)	0.4 (± 0.8)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Primary: pain score hour 46

End point title	pain score hour 46

End point description:

End point type	Primary

End point timeframe:
pain score 46 hours after extubation and still on ICU ward

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: pain score				
arithmetic mean (standard deviation)	1.9 (± 1.7)	0 (± 0)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Primary: pain score hour 17	
End point title	pain score hour 17
End point description:	

End point type	Primary
End point timeframe:	
pain score 17 hours after extubation and still on ICU ward	

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: pain score				
arithmetic mean (standard deviation)	2.4 (± 2.3)	0.6 (± 1.1)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Primary: RASS POD 1 20:00	
End point title	RASS POD 1 20:00
End point description:	

End point type	Primary

End point timeframe:
Richmond agitation-sedation scale post operative day 1 20:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: RASS				
arithmetic mean (standard deviation)	0 (± 0.26)	0.03 (± 0.17)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: cumulative opioid dose

End point title	cumulative opioid dose

End point description:

End point type	Secondary

End point timeframe:
in milligrams intravenous morphine equivalents

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: milligram(s)				
arithmetic mean (standard deviation)	39.84 (± 21.96)	241.94 (± 218.73)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	continuous morphine pump v sublingual sufentanil tablet system
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: Incidence of PONV

End point title	Incidence of PONV

End point description:

End point type	Secondary

End point timeframe:

incindence of postoperative nausea and vomiting during study conduct

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: incidence of PONV	10	14		

Statistical analyses

No statistical analyses for this end point

Secondary: incidence of sedation

End point title	incidence of sedation

End point description:

End point type	Secondary

End point timeframe:

incidence of sedation during study conduct

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: incidence of sedation	2	1		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: RASS POD 1 8:00

End point title	RASS POD 1 8:00

End point description:

End point type	Secondary

End point timeframe:

Richmond agitation-sedation scale post operative day 1 8:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: RASS				
arithmetic mean (standard deviation)	-0.06 (± 0.44)	-0.03 (± 0.47)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	continuous morphine pump v sublingual sufentanil tablet system

Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: RASS POD 2 8:00

End point title	RASS POD 2 8:00

End point description:

End point type	Secondary

End point timeframe:

Richmond agitation-sedation scale post operative day 2 8:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: RASS				
arithmetic mean (standard deviation)	0.13 (± 0.34)	0 (± 0)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: RASS POD 2 20:00

End point title	RASS POD 2 20:00

End point description:

End point type	Secondary

End point timeframe:

Richmond agitation-sedation scale post operative day 2 20:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: RASS				
arithmetic mean (standard deviation)	-0.13 (± 0.72)	0.06 (± 0.35)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: RASS POD 3 8:00

End point title	RASS POD 3 8:00

End point description:

End point type	Secondary

End point timeframe:

Richmond agitation-sedation scale post operative day 3 8:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: RASS				
arithmetic mean (standard deviation)	-0.06 (± 0.81)	0.03 (± 0.17)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine

	pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: RASS POD3 20:00

End point title	RASS POD3 20:00

End point description:

End point type	Secondary

End point timeframe:

Richmond agitation-sedation scale post operative day 3 20:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: RASS				
arithmetic mean (standard deviation)	-0.13 (± 0.72)	0 (± 0)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: RR POD1 8:00

End point title	RR POD1 8:00

End point description:

End point type	Secondary

End point timeframe:

mean respiratory rate post operative day 1 8:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: breaths per minute				
arithmetic mean (standard deviation)	17 (± 5)	18 (± 5)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: RR POD 1 20:00

End point title	RR POD 1 20:00

End point description:

End point type	Secondary

End point timeframe:

Respiratory rate post operative day 1 20:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: breaths/minute				
arithmetic mean (standard deviation)	18 (± 6)	18 (± 4)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	continuous morphine pump v sublingual sufentanil tablet

	system
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: RR POD 2 8:00

End point title	RR POD 2 8:00

End point description:

End point type	Secondary

End point timeframe:

Respiratory rate post operative day 2 8:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: breaths/minute				
arithmetic mean (standard deviation)	17 (± 6)	20 (± 5)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: RR POD 3 8:00

End point title	RR POD 3 8:00

End point description:

End point type	Secondary

End point timeframe:

Respiratory rate post operative day 3 8:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: breaths/minute				
arithmetic mean (standard deviation)	20 (± 7)	19 (± 6)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: RR POD 3 20:00

End point title	RR POD 3 20:00

End point description:

End point type	Secondary

End point timeframe:

Respiratory rate post operative day 3 20:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: breaths/minute				
arithmetic mean (standard deviation)	21 (± 6)	21 (± 5)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine

	pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: RR POD 2 20:00

End point title	RR POD 2 20:00

End point description:

End point type	Secondary

End point timeframe:

respiratory rate post operative day 2 20:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: breaths/minute				
arithmetic mean (standard deviation)	19 (± 6)	20 (± 6)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	continuous morphine pump v sublingual sufentanil tablet system
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: HR POD 1 8:00

End point title	HR POD 1 8:00

End point description:

End point type	Secondary

End point timeframe:

heart rate post operative day 1 8:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: beats/minute				
arithmetic mean (standard deviation)	79 (± 11)	79 (± 13)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: HR POD 1 20:00

End point title	HR POD 1 20:00

End point description:

End point type	Secondary

End point timeframe:
heart rate postoperative day 1 20:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: beats/minute				
arithmetic mean (standard deviation)	79 (± 9)	83 (± 13)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine

	pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: HR POD 2 8:00

End point title	HR POD 2 8:00
End point description:	
End point type	Secondary
End point timeframe: heart rate postoperative day 2 8:00	

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: beats/minute				
arithmetic mean (standard deviation)	79 (± 12)	82 (± 10)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: HR POD 2 20:00

End point title	HR POD 2 20:00
End point description:	
End point type	Secondary
End point timeframe: heart rate postoperative day 2 20:00	

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: beats/minute				
arithmetic mean (standard deviation)	78 (± 12)	85 (± 18)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: HR POD 3 8:00

End point title	HR POD 3 8:00

End point description:

End point type	Secondary

End point timeframe:
heart rate postoperative day 3 8:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: beats/minute				
arithmetic mean (standard deviation)	81 (± 12)	83 (± 13)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine

	pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: HR POD 3 20:00

End point title	HR POD 3 20:00
End point description:	
End point type	Secondary
End point timeframe: heart rate postoperative day 3 20:00	

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: beats/minute				
arithmetic mean (standard deviation)	84 (± 21)	84 (± 17)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: BP POD 1 8:00

End point title	BP POD 1 8:00
End point description:	
End point type	Secondary
End point timeframe: blood pressure post operative day 1 8:00	

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: mmHg				
arithmetic mean (standard deviation)	82 (± 11)	79 (± 10)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: BP POD 1 20:00

End point title	BP POD 1 20:00

End point description:

End point type	Secondary

End point timeframe:

blood pressure post operative day 1 20:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: mmHg				
arithmetic mean (standard deviation)	79 (± 11)	79 (± 15)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine

	pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: BP POD 2 8:00

End point title	BP POD 2 8:00

End point description:

End point type	Secondary

End point timeframe:

blood pressure post operative day 2 8:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: mmHg				
arithmetic mean (standard deviation)	81 (± 21)	82 (± 10)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: BP POD 2 20:00

End point title	BP POD 2 20:00

End point description:

End point type	Secondary

End point timeframe:

blood pressure post operative day 2 20:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: mmHg				
arithmetic mean (standard deviation)	81 (± 10)	80 (± 9)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: BP POD 3 8:00

End point title	BP POD 3 8:00

End point description:

End point type	Secondary

End point timeframe:

blood pressure post operative day 3 8:00

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: mmHg				
arithmetic mean (standard deviation)	86 (± 14)	84 (± 10)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine

	pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Secondary: BP POD 3 20:00

End point title	BP POD 3 20:00
End point description:	
End point type	Secondary
End point timeframe:	
blood pressure post operative day 3 20:00	

End point values	sublingual sufentanil tablet system	continuous morphine pump		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	31	33		
Units: mmHg				
arithmetic mean (standard deviation)	77 (± 10)	80 (± 12)		

Statistical analyses

Statistical analysis title	chi square
Comparison groups	sublingual sufentanil tablet system v continuous morphine pump
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.05
Method	Chi-squared

Adverse events

Adverse events information

Timeframe for reporting adverse events:

adverse events were assessed as from signing the ICF till post operative day 3 (end of study).

Assessment type	Systematic

Dictionary used

Dictionary name	MedDRA
Dictionary version	22

Reporting groups

Reporting group title	subject group

Reporting group description: -

Serious adverse events	subject group		
Total subjects affected by serious adverse events			
subjects affected / exposed	1 / 21 (4.76%)		
number of deaths (all causes)	0		
number of deaths resulting from adverse events	0		
Nervous system disorders			
hallucinations			
subjects affected / exposed	1 / 21 (4.76%)		
occurrences causally related to treatment / all	1 / 1		
deaths causally related to treatment / all	0 / 0		

Frequency threshold for reporting non-serious adverse events: 5 %

Non-serious adverse events	subject group		
Total subjects affected by non-serious adverse events			
subjects affected / exposed	20 / 21 (95.24%)		
Cardiac disorders			
bradycardia			
subjects affected / exposed	7 / 21 (33.33%)		
occurrences (all)	7		
Blood and lymphatic system disorders			
hypotension			
subjects affected / exposed	11 / 21 (52.38%)		
occurrences (all)	11		
Respiratory, thoracic and mediastinal disorders			

hypoventilation subjects affected / exposed occurrences (all)	2 / 21 (9.52%) 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