Clinical trial results:
An open, randomized, controlled, single centre trial to evaluate CT image quality and diagnostic feasibility of Lumentin® 44, a new egg albumen based oral bowel filling agent, in comparison with diluted Omnipaque® and Movprep®, two commonly used agents in subjects referred for abdominal CT-examination.

Summary

EudraCT number	2017-002368-42
Trial protocol	SE
Global end of trial date	14 February 2019
Results information	
Result version number	v2 (current)
This version publication date	02 December 2020
First version publication date	20 March 2020
Version creation reason	• Correction of full data set Previously, the sec. endpoints bowel filling properties (extension and distension) and diagnostic ability were not presented as described in the protocol but by alternative methods of calculation. In this version, the calculation methods in the trial Protocol were used. i.e. sum of the both assessors' gradings of all small bowel sub-segments and the sum of the both assessors' gradings of all selected organs. The method of calculation did not have any impact on the interpretation of the results.

Trial information

Trial identification	
Sponsor protocol code	LUM-001
Additional study identifiers	
ISRCTN number	-
ClinicalTrials.gov id (NCT number)	NCT03326518
WHO universal trial number (UTN)	-

Notes:

Sponsors	
Sponsor organisation name	Lument AB
Sponsor organisation address	Scheelevägen 22, LUND, Sweden, 223 63
Public contact	CEO, Lument AB, olof.book@lumentab.com
Scientific contact	CEO, Lument AB, olof.book@lumentab.com

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	02 March 2020
Is this the analysis of the primary completion data?	Yes
Primary completion date	14 February 2019
Global end of trial reached?	Yes
Global end of trial date	14 February 2019
Was the trial ended prematurely?	No

Notes:

General information about the trial

Main objective of the trial:

To compare the mean difference in contrast density shown on abdominal CT-images when using the contrast agent Lumentin® 44, with abdominal CT-images using diluted Omnipaque® and with abdominal CT-images using Movprep®

General information:
This was an open, randomized, controlled, single centre Phase II trial of Lumentin® 44 in comparison with diluted Omnipaque® and Movprep® in subjects referred to CT-examination of the abdomen.
Eligible subjects were randomized to Lumentin® 44 (Lumentin 44 Arm), diluted Omnipaque® (diluted Omnipaque Arm), or Movprep® (movprep Arm) in a 2:1:1 ratio.
Lumentin was given in volumes of 750 mL to 1200 mL and Omnipaque and Movprep were given according to the general praxis of care at the clinical site.
The difference in contrast density between lumen and wall (mucosal lining) in CT-images was measured in 9 locations of the small bowel: 2 locations in each of the duodenum, jejunum, proximal ileum and distal ileum and in 1 location in the terminal ileum

Protection of trial subjects:

The trial was conducted in compliance with the protocol, the International Conference on Harmonisation (ICH) guidelines on good clinical practice (GCP), the applicable European Directives and local legal requirements, and the ethical principles of the latest revision of the Declaration of Helsinki as adopted by the World Medical Association.

All information containing personal data were handled in accordance with Swedish data protection legislation and with the EU Data Protection Directive (95/46/EC). In accordance with the legislation, the data does not identify any persons taking part in the trial.

Background therapy:

No background therapy was given.

Evidence for comparator:

The comparators, Omnipaque® and Movprep® used in the trial are both standard of care treatment, commonly used as contrast agents, in patients referred to abdominal CT-examinations.

Abbreviations used:
Abd-CT: Abdominal-CT
AE: Adverse events
CT: Computed tomography
FA: Full analysis
HU: Hounsfield units
IMP: Investigational medical product
ROI: Region of interest
SAE: Serious adverse events
vs.: versus

Actual start date of recruitment	28 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	Sweden: 45
Worldwide total number of subjects	45
EEA total number of subjects	45

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)	19
From 65 to 84 years	25
85 years and over	1

Subject disposition

Recruitment

Recruitment details:

Subjects referred for abdominal or thoracoabdominal CT-examination at the clinical site were informed of the trial by a letter added to the referral letter informing them on date and time for the CT-examination, and by advertising posters at referring clinics. Subjects who had received an invitation letter were contacted by phone.

Pre-assignment

Screening details:

Subjects who were interested in participating in the trial, were sent full subject information and were asked to read it before the CT-examination visit.

Period 1

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

Blinding implementation details:

Eligible subjects were to be randomized in a 2:1:1 ratio to Lumentin 44, Omnipaque or Movprep

Arms

Are arms mutually exclusive?	Yes
Arm title	Lumentin 44

Arm description:

Before CT-examination, subjects received Lumentin 44 in volumes of 750 mL to 1200 mL, which should be taken orally within 1 hour.

Arm type	Experimental
Investigational medicinal product name	Lumentin 44
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Oral liquid
Routes of administration	Oral use

Dosage and administration details:

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Lumentin 44 was provided as an aqueous dispersion, which was whipped to a foam at the clinical site. The foam contained 44% of air, which was the radiological key ingredient that caused the agent's contrast properties.

Arm title	Diluted Omnipaque

Arm description:

Before CT-examination, subjects received diluted Omnipaque in volumes according to standard of care praxis at the study site (target volume 1000 mL). The diluted Omnipaque should be taken orally within 1 hour.

Arm type	Active comparator
Investigational medicinal product name	Diluted Omnipaque
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Solution for injection
Routes of administration	Oral use

Dosage and administration details:

Before oral administration, 30 mL of Omnipaque 240 mg I/mL was mixed with 970 mL of water.

Arm title	Movprep

Arm description:

Before CT-examination, subjects received Movprep in volumes according to standard of care praxis at the study site (target volume 1000 mL). The Movprep solution should be taken orally within 1 hour.

Arm type	Active comparator
Investigational medicinal product name	Movprep
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Powder for oral solution
Routes of administration	Oral use

Dosage and administration details:

Before oral administration, the Movprep dose Units A and B were dissolved in 1000 mL of water.

Number of subjects in period 1	Lumentin 44	Diluted Omnipaque	Movprep
Started	19	12	14
Completed	16	12	13
Not completed	3	0	1
Consent withdrawn by subject	1	-	-
Lost to follow-up	1	-	1
Protocol deviation	1	-	-

Baseline characteristics

Reporting groups	
Reporting group title	Lumentin 44
Reporting group description:	
Before CT-examination, subjects received Lumentin 44 in volumes of 750 mL to 1200 mL, which should be taken orally within 1 hour.	
Reporting group title	Diluted Omnipaque
Reporting group description:	
Before CT-examination, subjects received diluted Omnipaque in volumes according to standard of care praxis at the study site (target volume 1000 mL). The diluted Omnipaque should be taken orally within 1 hour.	
Reporting group title	Movprep
Reporting group description:	
Before CT-examination, subjects received Movprep in volumes according to standard of care praxis at the study site (target volume 1000 mL). The Movprep solution should be taken orally within 1 hour.	

Reporting group values	Lumentin 44	Diluted Omnipaque	Movprep
Number of subjects	19	12	14
Age categorical			
Note: Age categorical is given for all 45 subjects who were enrolled in the trial.			
Units: Subjects			
In utero	0	0	0
Preterm newborn infants (gestational age < 37 wks)	0	0	0
Newborns (0-27 days)	0	0	0
Infants and toddlers (28 days-23 months)	0	0	0
Children (2-11 years)	0	0	0
Adolescents (12-17 years)	0	0	0
Adults (18-64 years)	6	5	8
From 65-84 years	13	6	6
85 years and over	0	1	0
Age continuous			
Note: 45 subjects were enrolled but mean age values are shown for the FA set only. 2 subjects in the Lumentin 44 group were not included in th FA set: 1 female (75 years), who did not fulfill eligibility criteria and was not treated, and 1 female (75 years), who was unable to drink Lumentin 44 and withdrew consent.			
Units: years			
arithmetic mean	64.7	64.9	59.4
standard deviation	± 16.2	± 14.1	± 15.8
Gender categorical			
Gender categorical is given for all 45 subjects who were included in the trial.			
Units: Subjects			
Female	11	8	8
Male	8	4	6

Reporting group values	Total		
Number of subjects	45		

Age categorical			
Note: Age categorical is given for all 45 subjects who were enrolled in the trial.			
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)	19		
From 65-84 years	25		
85 years and over	1		
Age continuous			
Note: 45 subjects were enrolled but mean age values are shown for the FA set only. 2 subjects in the Lumentin 44 group were not included in th FA set: 1 female (75 years), who did not fulfill eligibility criteria and was not treated, and 1 female (75 years), who was unable to drink Lumentin 44 and withdrew consent.			
Units: years			
arithmetic mean			
standard deviation	-		
Gender categorical			
Gender categorical is given for all 45 subjects who were included in the trial.			
Units: Subjects			
Female	27		
Male	18		

Subject analysis sets

Subject analysis set title	Safety set
Subject analysis set type	Safety analysis

Subject analysis set description:

All subjects who drank at least some part of the stipulated dose of contrast agent (Lumentin 44, diluted Omnipaque, or Movprep) were included in the Safety Data Set of the trial. The subjects were included in the analysis according to the treatment actually received.

18 (94.7%) out of the 19 randomised subjects in Lumentin 44 group, 12 out of 12 (100%) of the randomised subjects in the Omnipaque group, and 14 out of 14 (100%) of the randomised subjects in the Movprep group were included in the Safety population.

Subject analysis set title	Full Analysis (FA) Set
Subject analysis set type	Full analysis

Subject analysis set description:

All correctly included and randomised subjects who received at least some portion of the contrast agents (Lumentin 44, diluted Omnipaque, or Movprep) and for whom a CT-examination was performed. All subjects were included in the group according to the intention based on the randomisation.

17 (89.5%) out of the 19 randomised subjects in Lumentin 44 group, 12 out of 12 (100%) of the randomised subjects in the Omnipaque group, and 14 out of 14 (100%) of the randomised subjects in the Movprep group were included in the FA population.

Reporting group values	Safety set	Full Analysis (FA) Set	
Number of subjects	44	43	
Age categorical			
Note: Age categorical is given for all 45 subjects who were enrolled in the trial.			
Units: Subjects			
In utero	0	0	
Preterm newborn infants (gestational age < 37 wks)	0	0	
Newborns (0-27 days)	0	0	
Infants and toddlers (28 days-23 months)	0	0	
Children (2-11 years)	0	0	
Adolescents (12-17 years)	0	0	
Adults (18-64 years)	19	19	
From 65-84 years	24	23	
85 years and over	1	1	
Age continuous			
Note: 45 subjects were enrolled but mean age values are shown for the FA set only. 2 subjects in the Lumentin 44 group were not included in th FA set: 1 female (75 years), who did not fulfill eligibility criteria and was not treated, and 1 female (75 years), who was unable to drink Lumentin 44 and withdrew consent.			
Units: years			
arithmetic mean			
standard deviation	±	±	
Gender categorical			
Gender categorical is given for all 45 subjects who were included in the trial.			
Units: Subjects			
Female	26	25	
Male	18	18	

End points

End points reporting groups

Reporting group title	Lumentin 44

Reporting group description:

Before CT-examination, subjects received Lumentin 44 in volumes of 750 mL to 1200 mL, which should be taken orally within 1 hour.

Reporting group title	Diluted Omnipaque

Reporting group description:

Before CT-examination, subjects received diluted Omnipaque in volumes according to standard of care praxis at the study site (target volume 1000 mL). The diluted Omnipaque should be taken orally within 1 hour.

Reporting group title	Movprep

Reporting group description:

Before CT-examination, subjects received Movprep in volumes according to standard of care praxis at the study site (target volume 1000 mL). The Movprep solution should be taken orally within 1 hour.

Subject analysis set title	Safety set
Subject analysis set type	Safety analysis

Subject analysis set description:

All subjects who drank at least some part of the stipulated dose of contrast agent (Lumentin 44, diluted Omnipaque, or Movprep) were included in the Safety Data Set of the trial. The subjects were included in the analysis according to the treatment actually received.

18 (94.7%) out of the 19 randomised subjects in Lumentin 44 group, 12 out of 12 (100%) of the randomised subjects in the Omnipaque group, and 14 out of 14 (100%) of the randomised subjects in the Movprep group were included in the Safety population.

Subject analysis set title	Full Analysis (FA) Set
Subject analysis set type	Full analysis

Subject analysis set description:

All correctly included and randomised subjects who received at least some portion of the contrast agents (Lumentin 44, diluted Omnipaque, or Movprep) and for whom a CT-examination was performed. All subjects were included in the group according to the intention based on the randomisation.

17 (89.5%) out of the 19 randomised subjects in Lumentin 44 group, 12 out of 12 (100%) of the randomised subjects in the Omnipaque group, and 14 out of 14 (100%) of the randomised subjects in the Movprep group were included in the FA population.

Primary: Difference in Contrast Density

End point title	Difference in Contrast Density

End point description:

The difference in contrast density was measured indepentently by 2 investigators in 2 locations in each of the 4 defined sub-segments: duodenum, jejunum, proximal ileum, and distal ileum, and in 1 location of the terminal ileum.

Regions of interest (ROI) measuring 6 mm in diameter were selected in the lumen of each location. The ROIs were placed where the lumen was best shown in the CT-image. The CT-scan software provided a mean HU measurement of each of the selected ROIs and the values were recorded by the Investigators.

The HU of the wall was set to +80HU as a standard for all measurements. It was not possible to discriminate between the lumen and the wall for Movprep and Diluted Omnipaque as they have a contrast similar to the wall contrast.

The difference in contrast density between bowel lumen and wall were calculated by subtracting the pinpoint HU value(s) of the wall (+80HU) from the mean ROI HU value(s) of the lumen, and the absolute value was presented.

End point type	Primary

End point timeframe:

CT-examination, Day 1

End point values	Lumentin 44	Diluted Omnipaque	Movprep	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	17	12	14	
Units: HU (Hounsfield Units)				
arithmetic mean (standard deviation)	484.0 (± 192.4)	122.1 (± 81.4)	64.5 (± 15.9)	

Statistical analyses

Statistical analysis title	Wilcoxon rank sum test

Statistical analysis description:

The null-hypothesis that the primary efficacy variable is equal in the groups was tested by means of the Wilcoxon rank sum test. In each of these analyses a 2-sided p-value less than 5% was considered statistically significant.

Comparison groups	Diluted Omnipaque v Movprep v Lumentin 44
Number of subjects included in analysis	43
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	< 0.0001 [1]
Method	Wilcoxon (Mann-Whitney)

Notes:

[1] - Analysis of Lumentin 44 vs. diluted Omnipaque: P-value <0.0001
Analysis of Lumentin 44 vs. Movprep: P-value <0.0001

Secondary: Bowel Filling Properties, Extension

End point title	Bowel Filling Properties, Extension

End point description:

The bowel filling agent was distributed along the length of small bowel, i.e. the extension. The filling of each of the 5 selected sub-segments of the small bowel in terms of extension was examined on the CT-scan by 2 investigators, independently of each other, and graded using Likert scales between 1 and 9.

Extension scale:
1. No sign of contrast agent
2. Trace of contrast agent filling
3. Segment filled to ca. 25%
4. Segment filled to >25% but <50%
5. Filled to segment filled to 50%
6. Segment filled > 50% but <75%
7. Segment filled to ca. 75%
8. Segment filled to >75% but <100%
9. Segment filled to 100%

The Extension score is the sum of the grades of both assessors and in each sub-segment and hence range from 10 to 90.

End point type	Secondary

End point timeframe:

CT-examination, Day 1

End point values	Lumentin 44	Diluted Omnipaque	Movprep	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	17	12	14	
Units: Likert Scale (1-9)				
arithmetic mean (standard deviation)	63.0 (± 21.7)	61.2 (± 15.9)	71.8 (± 10.6)	

Statistical analyses

Statistical analysis title	Wilcoxon rank sum test

Statistical analysis description:

The null-hypothesis that the primary efficacy variable is equal in the groups was tested by means of the Wilcoxon rank sum test. In each of these analyses a 2-sided p-value less than 5% was considered statistically significant.

Comparison groups	Lumentin 44 v Diluted Omnipaque v Movprep
Number of subjects included in analysis	43
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.8419 [2]
Method	Wilcoxon (Mann-Whitney)

Notes:

[2] - Analysis of Lumentin 44 vs. diluted Omnipaque: P-value =0.8419
Analysis of Lumentin 44 vs. Movprep: P-value =0.3305

Secondary: Bowel filling properties, Distension

End point title	Bowel filling properties, Distension

End point description:

The bowel filling agent caused a local widening of the bowel loop, distension.
The filling of each of the 5 selected sub-segments of the small bowel in terms of distension was examined on the CT-scan by both the 2 investigators independently of each other, and graded using Likert scales between 1 and 9.

Distension scale:
1. No identifiable contrast agent
2. A minimal amount of contrast agent is identified
3. Small amount of contrast agent, insufficient for placing a ROI of 6 mm
4. Amount of contrast agent just allowing for a ROI of 6 mm
5. Medium filled bowel loop
6. Slightly better than grade 5
7. Good filling
8. Optimal filling
9. Excellent or almost over distended

The Distension score is the sum of the grades of both assessors and in each sub-segment and range from 10 to 90.

End point type	Secondary

End point timeframe:

CT-examination, Day 1

End point values	Lumentin 44	Diluted Omnipaque	Movprep	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	17	12	14	
Units: Likert Scale (1-9)				
arithmetic mean (standard deviation)	48.1 (± 18.1)	47.0 (± 12.2)	54.7 (± 8.6)	

Statistical analyses

Statistical analysis title	Wilcoxon rank sum test

Statistical analysis description:

The null-hypothesis that the primary efficacy variable is equal in the groups was tested by means of the Wilcoxon rank sum test. In each of these analyses a 2-sided p-value less than 5% was considered statistically significant.

Comparison groups	Lumentin 44 v Diluted Omnipaque v Movprep
Number of subjects included in analysis	43
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.9823 [3]
Method	Wilcoxon (Mann-Whitney)

Notes:

[3] - Analysis of Lumentin 44 vs. diluted Omnipaque: P-value =0.9823
Analysis of Lumentin 44 vs. Movprep: P-value =0.2333

Secondary: Diagnostic Ability when Examining Abdominal CT

End point title	Diagnostic Ability when Examining Abdominal CT

End point description:

Diagnostic ability when examining Abd-CT was assessed on the CT-scan by the 2 investigators independently of each other.
The following features were assessed:

- Small bowel appearance
- Parenchymal organs, i.e. Pancreas, ovaries, urinary bladder
- Mesenterium and omentum

using a Likert scales of 1-9 ranging, where:

1. Impossible to observe details
5. Medium
9. Excellent resolution

The Diagnostic ability score was the sum of the scores from both assessors and ranged from 6 to 54.

End point type	Secondary

End point timeframe:

CT-examination, Day 1

End point values	Lumentin 44	Diluted Omnipaque	Movprep	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	17	12	14	
Units: Likert Scale (1-9)				
arithmetic mean (standard deviation)	43.1 (± 4.8)	39.9 (± 5.9)	41.4 (± 4.4)	

Statistical analyses

Statistical analysis title	Wilcoxon rank sum test

Statistical analysis description:

The null-hypothesis that the primary efficacy variable is equal in the groups was tested by means of the Wilcoxon rank sum test. In each of these analyses a 2-sided p-value less than 5% was considered statistically significant.

Comparison groups	Lumentin 44 v Diluted Omnipaque v Movprep
Number of subjects included in analysis	43
Analysis specification	Pre-specified
Analysis type	equivalence
P-value	= 0.1755 [4]
Method	Wilcoxon (Mann-Whitney)

Notes:

[4] - Analysis of Lumentin 44 vs. diluted Omnipaque: P-value =0.1755
Analysis of Lumentin 44 vs. Movprep: P-value =0.3284

Secondary: Degradation of Contrast Agent (Lumentin® 44)

End point title	Degradation of Contrast Agent (Lumentin® 44)[5]

End point description:

Degradation of Lumentin 44 was founded on the 2 characteristics; coalescence and syneresis or drainage.
Coalescence:

0. No bubbles visually detectable at the CT-scan
1. Bubbles visually detectable at the CT-scan

Syneresis or drainage:

0. No syneresis or drainage, i.e. separation of air and liquid phases, observed
1. Syneresis or drainage observed

Signs of degradation were assessed on the CT-scan, by both Investigator and Sub-Investigator, independently of each other, in each of the 5 selected sub-segments of the small bowel.
The degradation of contrast agents score is the sum of the scores from both assessors and in each sub-segment and range from 0 to 20.

End point type	Secondary

End point timeframe:

CT-Examination, Day 1

Notes:

[5] - The end point is not reporting statistics for all the arms in the baseline period. It is expected all the baseline period arms will be reported on when providing values for an end point on the baseline period.
Justification: Lumentin 44 is a foam containing air, and it could be suspected that the air bubbles would not withstand the condition in the stomach or the intestines. Therefore, the end point Degradation of Contrast Agent was only valid for Lumentin 44 and it was included to prove the resisting power of Lumentin 44 and not to compare the IMP with Omnipaque or Movprep.

End point values	Lumentin 44			
Subject group type	Reporting group			
Number of subjects analysed	17			
Units: Score (1-20)				
arithmetic mean (standard deviation)	0.647 (± 0.996)			

Statistical analyses

No statistical analyses for this end point

Secondary: Subjects' Assessment of Taste of the Contrast Agent

End point title	Subjects' Assessment of Taste of the Contrast Agent

End point description:

The subjects assessed taste on a five degree-scale:
1. Very negative
2. Negative
3. Neutral
4. Positive
5. Very positive

End point type	Secondary

End point timeframe:

Day 1

End point values	Lumentin 44	Diluted Omnipaque	Movprep	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	17	12	14	
Units: Score (1-5)				
median (full range (min-max))	4.0 (3.0 to 5.0)	4.0 (3.0 to 5.0)	2.5 (1.0 to 4.0)	

Statistical analyses

No statistical analyses for this end point

Secondary: Subjects' Assessment of Smell of the Contrast Agent

End point title	Subjects' Assessment of Smell of the Contrast Agent

End point description:

The subjects assessed smell on a five degree-scale:
1. Very negative
2. Negative
3. Neutral
4. Positive
5. Very positive

End point type	Secondary

End point timeframe:

Day 1

End point values	Lumentin 44	Diluted Omnipaque	Movprep	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	17	12	14	
Units: Score (1-5)				
median (full range (min-max))	4.0 (3.0 to 5.0)	4.0 (3.0 to 5.0)	3.0 (2.0 to 5.0)	

Statistical analyses

No statistical analyses for this end point

Secondary: Subjects' Assessment of Consistency of the Contrast Agent

End point title	Subjects' Assessment of Consistency of the Contrast Agent

End point description:

The subjects assessed consistency on a five degree-scale:
1. Very negative
2. Negative
3. Neutral
4. Positive
5. Very positive

End point type	Secondary

End point timeframe:

Day 1

End point values	Lumentin 44	Diluted Omnipaque	Movprep	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	17	12	14	
Units: Score (1-5)				
median (full range (min-max))	3.0 (2.0 to 4.0)	4.0 (3.0 to 5.0)	3.0 (2.0 to 4.0)	

Statistical analyses

No statistical analyses for this end point

Secondary: Subjects' Assessment of Ability to Swallow the Contrast Agent

End point title	Subjects' Assessment of Ability to Swallow the Contrast Agent

End point description:

The subjects assessed ability to swallow on a five degree-scale:
1. Very difficult
2. Difficult
3. Medium

4. Easy
5. Very easy

End point type	Secondary
End point timeframe:	
Day 1	

End point values	Lumentin 44	Diluted Omnipaque	Movprep	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	17	12	14	
Units: Score (1-5)				
median (full range (min-max))	3.0 (2.0 to 4.0)	5.0 (2.0 to 5.0)	3.0 (1.0 to 5.0)	

Statistical analyses

No statistical analyses for this end point

Secondary: Subjects' Assessment of Fullness after Drinking the Contrast Agent

End point title	Subjects' Assessment of Fullness after Drinking the Contrast Agent

End point description:

The subjects assessed fullness on a five degree-scale:
1. Very full
2. Full
3. Medium full
4. Barely full
5. Not at all full.

End point type	Secondary
End point timeframe:	
Day 1	

End point values	Lumentin 44	Diluted Omnipaque	Movprep	
Subject group type	Reporting group	Reporting group	Reporting group	
Number of subjects analysed	17	12	14	
Units: Score (1-5)				
median (full range (min-max))	2.0 (1.0 to 4.0)	3.0 (2.0 to 4.0)	3.0 (1.0 to 5.0)	

Statistical analyses

No statistical analyses for this end point

Adverse events

Adverse events information

Timeframe for reporting adverse events:

AEs were reported from start of intake of the study drug and until a telephone interview, taking place 12–48 hours after the CT-examination.

Adverse event reporting additional description:

AEs were collected using non-leading questions, observed, or spontaneously volunteered by subjects.

Especially solicited AEs were: Stomach ache, Burping, Letting of wind, Nausea, Sensation of fullness. Solicited AEs and abnormal clinical significant laboratory values were also to be included in "all AEs".

Assessment type	Systematic

Dictionary used

Dictionary name	MedDRA
Dictionary version	19.0

Reporting groups

Reporting group title	Lumentin 44

Reporting group description:

Before CT-scan, subjects received Lumentin 44 in volumes of 750 mL to 1200 mL, which should be taken
within 1 hour. All AEs reported (including solicited AEs) are presented.

Reporting group title	Diluted Omnipaque

Reporting group description:

Before CT-scan, subjects received Omnipaque in volumes according to standard of care (target volume 1000 mL), which should be taken within 1 hour. All AEs reported (including solicited AEs) are presented.

Reporting group title	Movprep

Reporting group description:

Before CT-scan, subjects received Movprep in volumes according to standard of care (target volume 1000 mL), which should be taken within 1 hour. All AEs reported (including solicited AEs) are presented.

Serious adverse events	Lumentin 44	Diluted Omnipaque	Movprep
Total subjects affected by serious adverse events			
subjects affected / exposed	0 / 18 (0.00%)	0 / 12 (0.00%)	0 / 14 (0.00%)
number of deaths (all causes)	0	0	0
number of deaths resulting from adverse events	0	0	0

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

Non-serious adverse events	Lumentin 44	Diluted Omnipaque	Movprep
Total subjects affected by non-serious adverse events			
subjects affected / exposed	7 / 18 (38.89%)	7 / 12 (58.33%)	8 / 14 (57.14%)
General disorders and administration site conditions			

Chills	Additional description: Not solicited event.		
subjects affected / exposed	0 / 18 (0.00%)	1 / 12 (8.33%)	0 / 14 (0.00%)
occurrences (all)	0	1	0
Gastrointestinal disorders			
Abdominal distension	Additional description: Solicited AE: Sensation of fullness		
subjects affected / exposed	1 / 18 (5.56%)	1 / 12 (8.33%)	1 / 14 (7.14%)
occurrences (all)	1	1	1
Abdominal pain upper	Additional description: Solicited AE: Stomach ache		
subjects affected / exposed	1 / 18 (5.56%)	3 / 12 (25.00%)	3 / 14 (21.43%)
occurrences (all)	1	3	3
Diarrhoea	Additional description: Not solicited event.		
subjects affected / exposed	0 / 18 (0.00%)	3 / 12 (25.00%)	6 / 14 (42.86%)
occurrences (all)	0	3	6
Eructation	Additional description: Solicited AE: Burping		
subjects affected / exposed	1 / 18 (5.56%)	0 / 12 (0.00%)	0 / 14 (0.00%)
occurrences (all)	1	0	0
Flatulence	Additional description: Solicited AE: Letting of wind		
subjects affected / exposed	4 / 18 (22.22%)	4 / 12 (33.33%)	3 / 14 (21.43%)
occurrences (all)	4	4	3
Nausea	Additional description: Solicited event: Nausea		
subjects affected / exposed	2 / 18 (11.11%)	2 / 12 (16.67%)	1 / 14 (7.14%)
occurrences (all)	2	2	1
Rectal haemorrhage	Additional description: Not solicited event.		
subjects affected / exposed	1 / 18 (5.56%)	0 / 12 (0.00%)	0 / 14 (0.00%)
occurrences (all)	1	0	0

More information

Substantial protocol amendments (globally)

Were there any global substantial amendments to the protocol? Yes

Date	Amendment
11 November 2017	Amendment No. 1 was implemented before start of enrollment. • The minimum volumes of diluted Omnipaque and Movprep required to be taken by the subject were adjusted to comply with the general praxis of care at the Department of Imaging and Function, Skåne University Hospital. • The dose for the intravenous contrast agent, Omnipaque® 350 mg I/mL, which in error was stated as 60 to 90 mL, was corrected to the dose range according to the standard procedure: 60 to 115 mL. • The exclusion criterion, prohibiting the inclusion of subjects participating in other clinical studies, was revised to allow participating in an oncology clinical trial if the subject was in the follow-up phase of the trial or had been on reduced maintenance treatment for at least the last 6 weeks.
05 July 2018	• The assessment of the primary objective in the trial was changed to directly measure the mean difference in contrast density between the lumen and the wall of the intestine instead of relating it to the contrast density of the stomach. The reason for the change was that the main objective of the trial was to show differences between the 3 contrast agents. The patients came to the CT-examination fasted which led to that the density of the stomach was on par with the bowel. The difference between the contrast agents might therefore be obscured by relating the contrast density within patients to the contrast density of the stomach. • The total number of subjects to be recruited was lowered from 114 to 80 evaluable subjects. The number of subjects in the Lumentin 44 arm would be 40 and in the 2 comparator arms the numbers were set to 20. Because of this change, the power of the trial was lowered from 90% to 78% (with a maintained 2-sided p-value less than 0.0500) in the previous version of the protocol. • To facilitate recruitment, posters were placed at the oncology departments at Skåne University Hospital and invitation letters were handed out to those interested. • The inclusion criteria were changed so fasting for 4 hours was required before intake of contrast agent for patients coming for CT-examination. This change was made to ensure that the contrast agents reached the terminal sections of the bowel. • For diluted Omnipaque, one of the standard oral contrast agents, the addition of 30 mL 70% Sorbitol was omitted. The reason was that some patients were reluctant to take this contrast agent due to undesirable side effects of the Sorbitol additive. General praxis of care at the Department of Imaging and Function, Skåne University Hospital, includes dilution of Omnipaque both with and without Sorbitol addition. Omission of Sorbitol in this trial was therefore not considered to have any negative effect on neither subject safety nor evaluation of the trial.

Notes:

Interruptions (globally)

Were there any global interruptions to the trial? No

Limitations and caveats

None reported