Clinical trial results:
Lung HeXeRT: Advanced proton, hyperpolarised 3helium and 129xenon magnetic resonance imaging for lung cancer radiotherapy planning and evaluation

Summary

EudraCT number	2013-004837-34
Trial protocol	GB
Global end of trial date	08 August 2019

Results information

Result version number	v1 (current)
This version publication date	10 September 2022
First version publication date	10 September 2022
Summary attachment (see zip file)	Paper 2 Results (Paper 2 Results.pdf)

Trial information

Trial identification

Sponsor protocol code	STH17245

Additional study identifiers

ISRCTN number	-
ClinicalTrials.gov id (NCT number)	NCT01859650
WHO universal trial number (UTN)	-

Notes:

Sponsors

Sponsor organisation name	Sheffield Teaching Hospitals NHS Foundation Trust
Sponsor organisation address	Trust Headquarters, 8 Beech Hill Road, Sheffield, United Kingdom, S10 2SB
Public contact	Dr Dipak Patel, Sheffield Teaching Hospitals NHS Foundation Trust, sth.ResearchAdministration@nhs.net
Scientific contact	Dr Dipak Patel, Sheffield Teaching Hospitals NHS Foundation Trust, sth.ResearchAdministration@nhs.net

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	08 August 2019
Is this the analysis of the primary completion data?	Yes
Primary completion date	08 August 2019
Global end of trial reached?	Yes
Global end of trial date	08 August 2019
Was the trial ended prematurely?	No

Notes:

General information about the trial

Main objective of the trial:

To develop and evaluate the use of advanced magnetic resonance imaging (MRI) techniques for patients with lung cancer undergoing radiotherapy.
1. To test the use of new MRI methods in treatment planning and for evaluating the treatment.

Protection of trial subjects:

All participants were given a participant information sheet to read and consider for at least 24 hours before attending for a screening visit for the study. Participants were reviewed by a clinician who was delegated to this task, according to the strict inclusion and exclusion criteria. All participants give written informed consent prior to enrolment to the study. GCP procedures were in place to ensure appropriate consent, confidentiality and privacy. Data were handled in accordance with the Data Protection Act. During the MR imaging procedure some patients may become claustrophobic whilst inside the scanning machine. In addition the injection of the contrast agent Gadovist may in some cases produce side effects. One of the IMPs Xenon gas has potential mild anaesthetic side effects. To minimise these risks all patients are assessed using an MRI safety screening questionnaire as for MR imaging in clinical practice, and all patients are informed about the process of MR scanning and potential side effects in the patient information sheet for the trial. During the imaging process the patients are carefully monitored. Patients who experience any side effects will be followed up by the responsible physician.

Background therapy: -

Evidence for comparator:

There are no comparators in the trial.
The Investigative Medicinal Products are:
Xenon 129 and 3 Helium which are both hyperpolarised gasses which are inhaled by patients to enhance MR images of the lungs.
Oxygen gas, given to patients to enhance MR imaging.
Gadovist, a contrast agent dye given to patients to enhance MR imaging.

Actual start date of recruitment	11 December 2014
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	United Kingdom: 22
Worldwide total number of subjects	22
EEA total number of subjects	22

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)	22
From 65 to 84 years	0
85 years and over	0

Subject disposition

Recruitment

Recruitment details:

Territory: single site study in Sheffield, UK.

Pre-assignment

Screening details:

Participants were screened according to eligibility criteria

Period 1

Period 1 title	Overall trial (overall period)
Is this the baseline period?	Yes
Allocation method	Not applicable
Blinding used	Not blinded

Blinding implementation details:

not applicable

Arms

Arm title	Arm 1

Arm description:

This is a non-randomised study of up to 22 subjects using hyperpolarised gas (3He and 129Xe), proton MR imaging and whole lung physiology methods (including multi breath washout)

Arm type	Experimental
Investigational medicinal product name	3 Helium gas
Investigational medicinal product code	MIA(IMP)29724
Other name	Helispin
Pharmaceutical forms	Inhalation solution
Routes of administration	Inhalation use

Dosage and administration details:

add from protocol

Investigational medicinal product name	Xenon 129 gas
Investigational medicinal product code	MIA(IMP)29724
Other name	
Pharmaceutical forms	Inhalation solution
Routes of administration	Inhalation use

Dosage and administration details:

add from protocol

Investigational medicinal product name	compressed medical oxygen
Investigational medicinal product code	PL 00735/5000, V03AN01
Other name	
Pharmaceutical forms	Medicinal gas, compressed
Routes of administration	Inhalation use

Dosage and administration details:

Oxygen is an IMP involved in the generation of MRI scans. During an MR imaging session, the subject will alternately breathe room air and up to 39.75 litres of 100% 02. It is classified as IMP in these studies but are "off the shelf" products being used unmodified with no special labelling and no special storage requirements. Medical oxygen is administered by inhalation through the lungs.

Investigational medicinal product name	Gadovist
Investigational medicinal product code	PL 00010/0535, V08C A09
Other name	Gadovist 1.0 mmol/ml solution for injection
Pharmaceutical forms	Solution for injection
Routes of administration	Intravenous use

Dosage and administration details:

0.05 ml per kg body weight of 1.0 mmol Gadovist via a power injector followed by a 20 ml saline flush. One dose of Gadovist per imaging session.

Number of subjects in period 1	Arm 1
Started	22
Completed	22

Baseline characteristics

Reporting groups	
Reporting group title	Overall trial

Reporting group description: -

Reporting group values	Overall trial	Total	
Number of subjects	22	22	
Age categorical 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)	22	22	
From 65-84 years	0	0	
85 years and over	0	0	
Gender categorical Units: Subjects			
Female	11	11	
Male	11	11	

End points

End points reporting groups

Reporting group title	Arm 1

Reporting group description:

This is a non-randomised study of up to 22 subjects using hyperpolarised gas (3He and 129Xe), proton MR imaging and whole lung physiology methods (including multi breath washout)

Primary: End Points Supplied in Published Papers

End point title	End Points Supplied in Published Papers[1]

End point description:

End point type	Primary

End point timeframe:

Whole study

Notes:

[1] - No statistical analyses have been specified for this primary end point. It is expected there is at least one statistical analysis for each primary end point.
Justification: Statistical analyses not suitable for this end point

End point values	Arm 1			
Subject group type	Reporting group			
Number of subjects analysed	1[2]			
Units: .	1			

Notes:

[2] - End points supplied in published papers

Statistical analyses

No statistical analyses for this end point

Adverse events

Adverse events information

Timeframe for reporting adverse events:

SAE reporting period is within 28 days of IMP administration.

Adverse event reporting additional description:

SAEs occurring outside of day 0-28 window will be exempt from immediate reporting and will not be recorded on CRF. Events otherwise meeting the criteria for SAEs but relating to specific criteria in protocol will not be reported as SAE and details will not be transcribed onto the case report form as an SAE; these events will be recorded in notes.

Assessment type	Systematic

Dictionary used

Dictionary name	MedDRA
Dictionary version	24.1

Reporting groups

Reporting group title	All enrolled

Reporting group description: -

Serious adverse events	All enrolled		
Total subjects affected by serious adverse events			
subjects affected / exposed	0 / 22 (0.00%)		
number of deaths (all causes)	4		
number of deaths resulting from adverse events	0		

Frequency threshold for reporting non-serious adverse events: 0 %

Non-serious adverse events	All enrolled		
Total subjects affected by non-serious adverse events			
subjects affected / exposed	14 / 22 (63.64%)		
Neoplasms benign, malignant and unspecified (incl cysts and polyps)			
Metastasis			
subjects affected / exposed	1 / 22 (4.55%)		
occurrences (all)	2		
Investigations			
CT scan abnormal			
subjects affected / exposed	1 / 22 (4.55%)		
occurrences (all)	1		
Abnormal LFTs			

subjects affected / exposed	2 / 22 (9.09%)		
occurrences (all)	2		
Cardiac disorders			
Angina			
subjects affected / exposed	1 / 22 (4.55%)		
occurrences (all)	1		
Nervous system disorders			
Vasovagal attack			
subjects affected / exposed	1 / 22 (4.55%)		
occurrences (all)	2		
Numbness			
subjects affected / exposed	1 / 22 (4.55%)		
occurrences (all)	1		
General disorders and administration site conditions			
Fatigue			
subjects affected / exposed	2 / 22 (9.09%)		
occurrences (all)	2		
Gastrointestinal disorders			
Indigestion			
subjects affected / exposed	1 / 22 (4.55%)		
occurrences (all)	1		
Nausea			
subjects affected / exposed	1 / 22 (4.55%)		
occurrences (all)	1		
Constipation			
subjects affected / exposed	2 / 22 (9.09%)		
occurrences (all)	2		
Respiratory, thoracic and mediastinal disorders			
COPD exacerbation			
subjects affected / exposed	1 / 22 (4.55%)		
occurrences (all)	1		
Musculoskeletal and connective tissue disorders			
Shoulder pain			
subjects affected / exposed	2 / 22 (9.09%)		
occurrences (all)	2		
Arthritis rheumatoid			

subjects affected / exposed occurrences (all)	1 / 22 (4.55%) 1		
Infections and infestations Chest infection subjects affected / exposed occurrences (all)	 2 / 22 (9.09%) 2		
Metabolism and nutrition disorders Hyponatremia subjects affected / exposed occurrences (all) Decreased appetite subjects affected / exposed occurrences (all)	 1 / 22 (4.55%) 1 1 / 22 (4.55%) 1		

More information

Substantial protocol amendments (globally)

Were there any global substantial amendments to the protocol? Yes

Date	Amendment
01 December 2016	Clarification of hospitilisation criteria reporting of SAE's. Clarification that the gas MRI imaging sequence consists of a calibration scan and main scan: a small dose followed by the main imaging dose and and removal of number of doses of Xenon and Helium allowable whilst keeping the total maximum IMP exposure within the limits approved by the MHRA. Confirmation of the method of delivery of oxygen treatment, confirming that only a proportion of oxygen dispensed will be inhaled and confirming the flow rate and maximum time for which oxygen will be administered.

Notes:

Interruptions (globally)

Were there any global interruptions to the trial? No

Limitations and caveats

Limitations of the trial such as small numbers of subjects analysed or technical problems leading to unreliable data.

Limitations of EudraCT system to report results of this study type.

Notes:

Online references

http://www.ncbi.nlm.nih.gov/pubmed/30355463