



## Clinical trial results:

### Effect of theophylline on histone deacetylase activity: enhancement of in-vitro glucocorticoid function in patients with COPD.

#### Summary

EudraCT number	2005-003344-62
Trial protocol	GB
Global end of trial date	29 August 2007

#### Results information

Result version number	v1 (current)
This version publication date	13 November 2019
First version publication date	13 November 2019

#### Trial information

##### Trial identification

Sponsor protocol code	mitHDAC
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##### Additional study identifiers

ISRCTN number	-
ClinicalTrials.gov id (NCT number)	NCT00241631
WHO universal trial number (UTN)	-

Notes:

#### Sponsors

Sponsor organisation name	Imperial College London
Sponsor organisation address	South Kensington Campus, London, United Kingdom, SW7 2AZ
Public contact	Prof Ian Adcock, Imperial College London, +44 20 7594 7840, ian.adcock@imperial.ac.uk
Scientific contact	Prof Ian Adcock, Imperial College London, +44 20 7594 7840, ian.adcock@imperial.ac.uk

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:

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**Results analysis stage**

Analysis stage	Final
Date of interim/final analysis	01 August 2008
Is this the analysis of the primary completion data?	Yes
Primary completion date	29 August 2007
Global end of trial reached?	Yes
Global end of trial date	29 August 2007
Was the trial ended prematurely?	No

Notes:

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**General information about the trial**

Main objective of the trial:

Does the addition of low dose theophylline (a drug already commonly used in Chronic Obstructive Lung Disease - COPD) restore the putative anti-inflammatory effects (measured from in-vitro samples taken by inducing sputum production) of inhaled steroids in patients with COPD?

Protection of trial subjects:

None

Background therapy: -

Evidence for comparator: -

Actual start date of recruitment	03 April 2006
Long term follow-up planned	No
Independent data monitoring committee (IDMC) involvement?	No

Notes:

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**Population of trial subjects****Subjects enrolled per country**

Country: Number of subjects enrolled	United Kingdom: 49
Worldwide total number of subjects	49
EEA total number of subjects	49

Notes:

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**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)	30
From 65 to 84 years	19
85 years and over	0

## Subject disposition

### Recruitment

Recruitment details:

Participants were recruited between April 2006 and August 2007.

### Pre-assignment

Screening details:

Total of Forty-nine theophylline-naïve (Global Initiative for Chronic Obstructive Lung Disease stage 2 or 3) patients with COPD were screened, 30 participants completed the study.

### Period 1

Period 1 title	Run-in
Is this the baseline period?	No
Allocation method	Non-randomised - controlled
Blinding used	Not blinded

### Arms

<b>Arm title</b>	All participants
Arm description: -	
Arm type	No intervention
No investigational medicinal product assigned in this arm	

<b>Number of subjects in period 1</b>	All participants
Started	49
Completed	43
Not completed	6
Physician decision	6

### Period 2

Period 2 title	Phase 1
Is this the baseline period?	No
Allocation method	Randomised - controlled
Blinding used	Double blind
Roles blinded	Subject, Investigator

### Arms

Are arms mutually exclusive?	Yes
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<b>Arm title</b>	Placebo
Arm description:	
Inhaled placebo capsule	
Arm type	Placebo
Investigational medicinal product name	Placebo
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Inhalation vapour, tablet
Routes of administration	Inhalation use
Dosage and administration details:	
4 weeks	
Investigational medicinal product name	Placebo
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Capsule
Routes of administration	Oral use
Dosage and administration details:	
placebo theophylline capsules for 4 weeks	
<b>Arm title</b>	Steroid
Arm description:	
Inhaled Theophylline placebo capsule, then Fluticasone Propionate 500 ug bid, then active Theophylline	
Arm type	Experimental
Investigational medicinal product name	Fluticasone Propionate
Investigational medicinal product code	
Other name	Flovent
Pharmaceutical forms	Inhalation vapour, capsule
Routes of administration	Inhalation use
Dosage and administration details:	
500 ug bid for 4 weeks	
Investigational medicinal product name	Placebo
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Capsule
Routes of administration	Oral use
Dosage and administration details:	
placebo theophylline capsules	

Number of subjects in period 2	Placebo	Steroid
Started	22	21
Completed	14	16
Not completed	8	5
Consent withdrawn by subject	4	4
Sore throat	1	-
Lost to follow-up	3	-
Lack of efficacy	-	1

**Period 3**

Period 3 title	Phase 2
Is this the baseline period?	Yes <sup>[1]</sup>
Allocation method	Randomised - controlled
Blinding used	Double blind
Roles blinded	Subject, Investigator

**Arms**

Are arms mutually exclusive?	Yes
<b>Arm title</b>	Placebo

Arm description:

Inhaled placebo plus oral slo-phylline capsule 250mg bid

Arm type	Placebo
Investigational medicinal product name	Theophylline
Investigational medicinal product code	
Other name	Slo-phyllin capsule
Pharmaceutical forms	Capsule
Routes of administration	Oral use

Dosage and administration details:

250 mg bid for 4 weeks

Investigational medicinal product name	Placebo
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Inhalation vapour, tablet
Routes of administration	Inhalation use

Dosage and administration details:

4 weeks

<b>Arm title</b>	Steroid
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Arm description:

Inhaled Fluticasomne propionate 500mg bid plus oral slo-phylline capsule 250mg bid

Arm type	Experimental
Investigational medicinal product name	Theophylline
Investigational medicinal product code	
Other name	Slo-phyllin capsule
Pharmaceutical forms	Capsule
Routes of administration	Oral use

Dosage and administration details:

250 mg bid for 4 weeks

Investigational medicinal product name	Fluticasone Propionate
Investigational medicinal product code	
Other name	Flovent
Pharmaceutical forms	Inhalation vapour, capsule
Routes of administration	Inhalation use

Dosage and administration details:

500 ug bid for 4 weeks

Notes:

[1] - Period 1 is not the baseline period. It is expected that period 1 will be the baseline period.

Justification: Baseline period we reported participants they completed the study

Number of subjects in period 3 <sup>[2]</sup>	Placebo	Steroid
Started	14	16
Completed	14	16

Notes:

[2] - The number of subjects reported to be in the baseline period are not the same as the worldwide number enrolled in the trial. It is expected that these numbers will be the same.

Justification: Baseline period we reported participants they completed the study

#### Period 4

Period 4 title	Wash out
Is this the baseline period?	No
Allocation method	Not applicable
Blinding used	Not blinded

#### Arms

Arm title	All participants
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Arm description:

All participants between phase 1 and 2, no treatment

Arm type	No intervention
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No investigational medicinal product assigned in this arm

Number of subjects in period 4	All participants
Started	30
Completed	30

## Baseline characteristics

### Reporting groups

Reporting group title	Placebo
Reporting group description: Inhaled placebo plus oral slo-phylline capsule 250mg bid	
Reporting group title	Steroid
Reporting group description: Inhaled Fluticasomne propionate 500mg bid plus oral slo-phylline capsule 250mg bid	

Reporting group values	Placebo	Steroid	Total
Number of subjects	14	16	30
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			
geometric mean	61	69	
standard deviation	± 2.2	± 1.9	-
Gender categorical Units: Subjects			
Female	3	2	5
Male	11	14	25

## End points

### End points reporting groups

Reporting group title	All participants
Reporting group description:	-
Reporting group title	Placebo
Reporting group description:	Inhaled placebo capsule
Reporting group title	Steroid
Reporting group description:	Inhaled Theophylline placebo capsule, then Fluticasone Propionate 500 ug bid, then active Theophylline
Reporting group title	Placebo
Reporting group description:	Inhaled placebo plus oral slo-phylline capsule 250mg bid
Reporting group title	Steroid
Reporting group description:	Inhaled Fluticasomne propionate 500mg bid plus oral slo-phylline capsule 250mg bid
Reporting group title	All participants
Reporting group description:	All participants between phase 1 and 2, no treatment

### Primary: Sputum Inflammatory Cell Counts

End point title	Sputum Inflammatory Cell Counts
End point description:	
End point type	Primary
End point timeframe:	10 weeks

End point values	Placebo	Steroid		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	14	16		
Units: millions cells/ ml				
log mean (confidence interval 95%)	5.42 (3.56 to 8.2)	3.89 (2.6 to 5.76)		

### Statistical analyses

Statistical analysis title	Sputum Inflammatory Cell Counts
Comparison groups	Placebo v Steroid



Number of subjects included in analysis	30
Analysis specification	Post-hoc
Analysis type	superiority
P-value	= 0.012
Method	Mixed models analysis

### Secondary: Interleukin 8 (IL8)

End point title	Interleukin 8 (IL8)
End point description:	
End point type	Secondary
End point timeframe:	
10 weeks	

End point values	Placebo	Steroid		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	14	16		
Units: ng/mL				
log mean (confidence interval 95%)	33.3 (20 to 56)	28.3 (19 to 42)		

### Statistical analyses

<b>Statistical analysis title</b>	IL 8
Comparison groups	Placebo v Steroid
Number of subjects included in analysis	30
Analysis specification	Post-hoc
Analysis type	superiority
P-value	< 0.05 <sup>[1]</sup>
Method	Mixed models analysis

Notes:

[1] - calculated

### Secondary: Total sputum eosinophils

End point title	Total sputum eosinophils
End point description:	
End point type	Secondary
End point timeframe:	
10 weeks	

<b>End point values</b>	Placebo	Steroid		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	14	16		
Units: millions/mL				
log mean (confidence interval 95%)	0.132 (0.09 to 0.2)	0.053 (0.03 to 0.1)		

## Statistical analyses

<b>Statistical analysis title</b>	Total sputum eosinophils
Comparison groups	Steroid v Placebo
Number of subjects included in analysis	30
Analysis specification	Post-hoc
Analysis type	superiority
P-value	< 0.05 <sup>[2]</sup>
Method	Mixed models analysis

Notes:

[2] - calculated

## Adverse events

### Adverse events information

Timeframe for reporting adverse events:

10 weeks

Assessment type	Non-systematic
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### Dictionary used

Dictionary name	MedDRA
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Dictionary version	10
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### Reporting groups

Reporting group title	Placebo
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Reporting group description:

Inhaled Theophylline placebo capsule, then placebo, then active Theophylline

Reporting group title	Steroid
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Reporting group description:

Inhaled Theophylline placebo capsule, then Fluticasone Propionate 500 ug bid, then active Theophylline

Serious adverse events	Placebo	Steroid	
Total subjects affected by serious adverse events			
subjects affected / exposed	0 / 14 (0.00%)	0 / 16 (0.00%)	
number of deaths (all causes)	0	0	
number of deaths resulting from adverse events	0	0	

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

Non-serious adverse events	Placebo	Steroid	
Total subjects affected by non-serious adverse events			
subjects affected / exposed	0 / 14 (0.00%)	4 / 16 (25.00%)	
Gastrointestinal disorders			
Nausea	Additional description: Mild nausea and stomach upset		
subjects affected / exposed	0 / 14 (0.00%)	4 / 16 (25.00%)	
occurrences (all)	0	4	

## More information

### Substantial protocol amendments (globally)

Were there any global substantial amendments to the protocol? No

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### Interruptions (globally)

Were there any global interruptions to the trial? No

### Limitations and caveats

None reported

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### Online references

<http://www.ncbi.nlm.nih.gov/pubmed/20299628>