



Clinical trial results:

Comparison of the effects of the electronic cigarette and nicotine inhalator on tobacco withdrawal symptoms over 24 hours of abstinence

Summary

| | |
|--------------------------|------------------|
| EudraCT number | 2011-005565-20 |
| Trial protocol | GB |
| Global end of trial date | 21 February 2013 |

Results information

| | |
|--------------------------------|--------------|
| Result version number | v1 (current) |
| This version publication date | 29 July 2017 |
| First version publication date | 29 July 2017 |

Trial information

Trial identification

| | |
|-----------------------|------------|
| Sponsor protocol code | QMUL111111 |
|-----------------------|------------|

Additional study identifiers

| | |
|------------------------------------|------------------|
| ISRCTN number | - |
| ClinicalTrials.gov id (NCT number) | NCT01454362 |
| WHO universal trial number (UTN) | U1111-1127-4445 |
| Other trial identifiers | Reda Ref: 008261 |

Notes:

Sponsors

| | |
|------------------------------|---|
| Sponsor organisation name | Queen Mary University of London |
| Sponsor organisation address | 5 Walden Street, London, United Kingdom, E1 2EF |
| Public contact | The Joint Research Office , QUEEN MARY, UNIVERSITY OF LONDON, 0207 882 7260, researchamendments@bartsandthelondon.nhs.uk |
| Scientific contact | The Joint Research Office , QUEEN MARY, UNIVERSITY OF LONDON, 0207 882 7260, researchamendments@bartsandthelondon.nhs.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:

Results analysis stage

| | |
|--|------------------|
| Analysis stage | Final |
| Date of interim/final analysis | 02 May 2017 |
| Is this the analysis of the primary completion data? | Yes |
| Primary completion date | 21 February 2013 |
| Global end of trial reached? | Yes |
| Global end of trial date | 21 February 2013 |
| Was the trial ended prematurely? | No |

Notes:

General information about the trial

Main objective of the trial:

The primary objective of this study is to investigate whether the E-C is more effective at alleviating withdrawal symptoms than the nicotine inhalator during 24hr abstinence.

Protection of trial subjects:

Participants were screened and consented by a medical doctor and completed a health problems checklist after product use.

Background therapy: -

Evidence for comparator: -

| | |
|---|-----------------|
| Actual start date of recruitment | 09 January 2013 |
| 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: 51 |
| Worldwide total number of subjects | 51 |
| EEA total number of subjects | 51 |

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) | 48 |
| From 65 to 84 years | 3 |
| 85 years and over | 0 |

Subject disposition

Recruitment

Recruitment details:

Participants were recruited at the Tobacco Dependence Research Unit in London between January 2013 and February 2013.

Pre-assignment

Screening details:

Inclusion Criteria

Smoking at least 12 cigarettes per day; first cigarette smoked within 60 mins of waking; willing to abstain from smoking for one day in 2 consecutive weeks.

Exclusion Criteria

Under 18s; current psychiatric illness; planning pregnancy, pregnant or breastfeeding; enrolled in other research, used EC or inhaler before.

Period 1

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

Blinding implementation details:

Not applicable

Arms

| | |
|------------------------------|----|
| Are arms mutually exclusive? | No |
|------------------------------|----|

| | |
|------------------|-------------|
| Arm title | E-cigarette |
|------------------|-------------|

Arm description: -

| | |
|--|---------------------|
| Arm type | Experimental |
| Investigational medicinal product name | E-cigarette |
| Investigational medicinal product code | |
| Other name | |
| Pharmaceutical forms | Inhalation solution |
| Routes of administration | Oral use |

Dosage and administration details:

As needed

| | |
|------------------|-----------|
| Arm title | Inhalator |
|------------------|-----------|

Arm description: -

| | |
|--|---------------------|
| Arm type | Active comparator |
| Investigational medicinal product name | Nicorette Inhalator |
| Investigational medicinal product code | |
| Other name | |
| Pharmaceutical forms | Inhalation vapour |
| Routes of administration | Oral use |

Dosage and administration details:

As needed.

| Number of subjects in period 1 | E-cigarette | Inhalator |
|---------------------------------------|-------------|-----------|
| Started | 51 | 51 |
| Completed | 51 | 51 |

Baseline characteristics

Reporting groups

| | |
|-----------------------|----------|
| Reporting group title | Baseline |
|-----------------------|----------|

Reporting group description: -

| Reporting group values | Baseline | Total | |
|---|----------|-------|--|
| Number of subjects | 51 | 51 | |
| 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) | 48 | 48 | |
| From 65-84 years | 3 | 3 | |
| 85 years and over | 0 | 0 | |
| Age 18+ | 0 | 0 | |
| Gender categorical | | | |
| Units: Subjects | | | |
| Female | 9 | 9 | |
| Male | 42 | 42 | |

End points

End points reporting groups

| | |
|--------------------------------|-------------|
| Reporting group title | E-cigarette |
| Reporting group description: - | |
| Reporting group title | Inhalator |
| Reporting group description: - | |

Primary: Mean withdrawal rating at 24 hours

| | |
|--|------------------------------------|
| End point title | Mean withdrawal rating at 24 hours |
| End point description: Mean withdrawal rating at 24 hours | |
| End point type | Primary |
| End point timeframe: 24 hours | |

| End point values | E-cigarette | Inhalator | | |
|--------------------------------------|-------------------|-------------------|--|--|
| Subject group type | Reporting group | Reporting group | | |
| Number of subjects analysed | 51 ^[1] | 51 ^[2] | | |
| Units: withdrawal rating | | | | |
| arithmetic mean (standard deviation) | 0.73 (± 0.64) | 0.86 (± 0.73) | | |

Notes:

[1] - Study was randomised crossover trial

[2] - Study was a randomised crossover trial

Statistical analyses

| | |
|---|--|
| Statistical analysis title | Comparison of mean withdrawal ratings at 24h |
| Comparison groups | Inhalator v E-cigarette |
| Number of subjects included in analysis | 102 |
| Analysis specification | Pre-specified |
| Analysis type | superiority |
| P-value | = 0.17 |
| Method | t-test, 2-sided |

Primary: Mean urge to smoke at 24 hours

| | |
|--|--------------------------------|
| End point title | Mean urge to smoke at 24 hours |
| End point description: Mean urge to smoke at 24 hours | |
| End point type | Primary |
| End point timeframe: 24 hours | |

| | | | | |
|--------------------------------------|--------------------|-------------------|--|--|
| End point values | E-cigarette | Inhalator | | |
| Subject group type | Reporting group | Reporting group | | |
| Number of subjects analysed | 51 | 51 | | |
| Units: urge rating | | | | |
| arithmetic mean (standard deviation) | 1.84 (\pm 0.91) | 2.28 (\pm 0.9) | | |

Statistical analyses

| | |
|---|--|
| Statistical analysis title | Comparison of mean urge to smoke at 24 hours |
| Comparison groups | E-cigarette v Inhalator |
| Number of subjects included in analysis | 102 |
| Analysis specification | Pre-specified |
| Analysis type | superiority |
| P-value | = 0.005 |
| Method | t-test, 2-sided |

Secondary: Mean change in salivary cotinine ng/ml

| | |
|----------------------------------|--|
| End point title | Mean change in salivary cotinine ng/ml |
| End point description: | |
| Mean change in salivary cotinine | |
| End point type | Secondary |
| End point timeframe: | |
| 24 hours | |

| | | | | |
|--------------------------------------|-----------------------|----------------------|--|--|
| End point values | E-cigarette | Inhalator | | |
| Subject group type | Reporting group | Reporting group | | |
| Number of subjects analysed | 49 | 49 | | |
| Units: change in salivary cotinine | | | | |
| arithmetic mean (standard deviation) | -66.32 (\pm 94.84) | -53.8 (\pm 119.4) | | |

Statistical analyses

| | |
|-----------------------------------|--|
| Statistical analysis title | Comparison of mean change in salivary cotinine ng/ |
| Comparison groups | E-cigarette v Inhalator |

| | |
|---|-----------------|
| Number of subjects included in analysis | 98 |
| Analysis specification | Pre-specified |
| Analysis type | superiority |
| P-value | = 0.43 |
| Method | t-test, 2-sided |

Secondary: Mean satisfaction from product when compared to cigarettes (rating 0-4)

| | |
|------------------------|---|
| End point title | Mean satisfaction from product when compared to cigarettes (rating 0-4) |
| End point description: | Mean satisfaction from product when compared to cigarettes (rating 0-4) |
| End point type | Secondary |
| End point timeframe: | 24 hours |

| End point values | E-cigarette | Inhalator | | |
|--------------------------------------|-----------------|-----------------|--|--|
| Subject group type | Reporting group | Reporting group | | |
| Number of subjects analysed | 51 | 51 | | |
| Units: satisfaction rating | | | | |
| arithmetic mean (standard deviation) | 1.18 (± 1.05) | 0.59 (± 1.1) | | |

Statistical analyses

| | |
|---|--|
| Statistical analysis title | Comparison of mean satisfaction from product |
| Comparison groups | E-cigarette v Inhalator |
| Number of subjects included in analysis | 102 |
| Analysis specification | Pre-specified |
| Analysis type | superiority |
| P-value | = 0.003 |
| Method | t-test, 2-sided |

Secondary: Mean pleasant feeling from using the product (rating 0-4)

| | |
|------------------------|---|
| End point title | Mean pleasant feeling from using the product (rating 0-4) |
| End point description: | Mean pleasant feeling from using the product (rating 0-4) |
| End point type | Secondary |
| End point timeframe: | 24 hours |

| End point values | E-cigarette | Inhalator | | |
|--------------------------------------|-----------------|-----------------|--|--|
| Subject group type | Reporting group | Reporting group | | |
| Number of subjects analysed | 51 | 51 | | |
| Units: pleasantness rating | | | | |
| arithmetic mean (standard deviation) | 2 (± 1.11) | 0.67 (± 0.89) | | |

Statistical analyses

| Statistical analysis title | Comparisons of Mean pleasant feeling |
|---|--------------------------------------|
| Comparison groups | E-cigarette v Inhalator |
| Number of subjects included in analysis | 102 |
| Analysis specification | Pre-specified |
| Analysis type | superiority |
| P-value | < 0.001 |
| Method | t-test, 2-sided |

Secondary: Mean enjoyment of the sensation in the throat and chest (rating 0-4)

| | |
|------------------------|--|
| End point title | Mean enjoyment of the sensation in the throat and chest (rating 0-4) |
| End point description: | Mean enjoyment of the sensation in the throat and chest (rating 0-4) |
| End point type | Secondary |
| End point timeframe: | 24 hours |

| End point values | E-cigarette | Inhalator | | |
|--------------------------------------|-----------------|-----------------|--|--|
| Subject group type | Reporting group | Reporting group | | |
| Number of subjects analysed | 51 | 51 | | |
| Units: enjoyment rating | | | | |
| arithmetic mean (standard deviation) | 1.65 (± 1.05) | 0.51 (± 0.7) | | |

Statistical analyses

| Statistical analysis title | Comparison of Mean enjoyment of the sensation |
|-----------------------------------|---|
| Comparison groups | E-cigarette v Inhalator |

| | |
|---|-----------------|
| Number of subjects included in analysis | 102 |
| Analysis specification | Pre-specified |
| Analysis type | superiority |
| P-value | < 0.001 |
| Method | t-test, 2-sided |

Secondary: Mean helpfulness of the product enabling the participant to keep from smoking (rating 0-4)

| | |
|------------------------|--|
| End point title | Mean helpfulness of the product enabling the participant to keep from smoking (rating 0-4) |
| End point description: | Mean helpfulness of the product enabling the participant to keep from smoking (rating 0-4) |
| End point type | Secondary |
| End point timeframe: | 24 hours |

| End point values | E-cigarette | Inhalator | | |
|--------------------------------------|-----------------|-----------------|--|--|
| Subject group type | Reporting group | Reporting group | | |
| Number of subjects analysed | 51 | 51 | | |
| Units: helpfulness rating | | | | |
| arithmetic mean (standard deviation) | 2.61 (± 1.08) | 1.69 (± 1.03) | | |

Statistical analyses

| | |
|---|---|
| Statistical analysis title | Comparison of mean helpfulness of the product |
| Comparison groups | E-cigarette v Inhalator |
| Number of subjects included in analysis | 102 |
| Analysis specification | Pre-specified |
| Analysis type | superiority |
| P-value | < 0.001 |
| Method | t-test, 2-sided |

Secondary: Mean embarrassment of using the products in company (rating 0-4)

| | |
|------------------------|--|
| End point title | Mean embarrassment of using the products in company (rating 0-4) |
| End point description: | Mean embarrassment of using the products in company (rating 0-4) |
| End point type | Secondary |
| End point timeframe: | 24 hours |

| End point values | E-cigarette | Inhalator | | |
|--------------------------------------|--------------------|--------------------|--|--|
| Subject group type | Reporting group | Reporting group | | |
| Number of subjects analysed | 51 | 51 | | |
| Units: embarrassment rating | | | | |
| arithmetic mean (standard deviation) | 0.75 (\pm 0.98) | 0.65 (\pm 0.98) | | |

Statistical analyses

| Statistical analysis title | Comparison of mean embarrassment |
|---|----------------------------------|
| Comparison groups | E-cigarette v Inhalator |
| Number of subjects included in analysis | 102 |
| Analysis specification | Pre-specified |
| Analysis type | superiority |
| P-value | = 0.53 |
| Method | t-test, 2-sided |

Secondary: Mean use of the products as a stop smoking aid, SSA (rating 0-4)

| | |
|------------------------|--|
| End point title | Mean use of the products as a stop smoking aid, SSA (rating 0-4) |
| End point description: | Mean use of the products as a stop smoking aid (rating 0-4) |
| End point type | Secondary |
| End point timeframe: | 24 hours |

| End point values | E-cigarette | Inhalator | | |
|--|--------------------|-------------------|--|--|
| Subject group type | Reporting group | Reporting group | | |
| Number of subjects analysed | 51 | 51 | | |
| Units: rating of product as stop smoking aid | | | | |
| arithmetic mean (standard deviation) | 3.16 (\pm 1.05) | 1.57 (\pm 1.2) | | |

Statistical analyses

| Statistical analysis title | Comparison of mean use of the products as a SSA |
|-----------------------------------|---|
| Comparison groups | E-cigarette v Inhalator |

| | |
|---|-----------------|
| Number of subjects included in analysis | 102 |
| Analysis specification | Pre-specified |
| Analysis type | superiority |
| P-value | < 0.001 |
| Method | t-test, 2-sided |

Secondary: Mean recommend the products to a friend who wants to quit smoking (rating 0-4)

| | |
|------------------------|--|
| End point title | Mean recommend the products to a friend who wants to quit smoking (rating 0-4) |
| End point description: | Mean recommend the products to a friend who wants to quit smoking (rating 0-4) |
| End point type | Secondary |
| End point timeframe: | 24 hours |

| End point values | E-cigarette | Inhalator | | |
|--------------------------------------|------------------|------------------|--|--|
| Subject group type | Reporting group | Reporting group | | |
| Number of subjects analysed | 51 | 51 | | |
| Units: recommendation rating | | | | |
| arithmetic mean (standard deviation) | 3.2 (\pm 1.1) | 1.9 (\pm 1.2) | | |

Statistical analyses

| | |
|---|---|
| Statistical analysis title | Comparison of mean recommend the products |
| Comparison groups | E-cigarette v Inhalator |
| Number of subjects included in analysis | 102 |
| Analysis specification | Pre-specified |
| Analysis type | superiority |
| P-value | < 0.001 |
| Method | t-test, 2-sided |

Adverse events

Adverse events information

Timeframe for reporting adverse events:

24 hours

| | |
|-----------------|------------|
| Assessment type | Systematic |
|-----------------|------------|

Dictionary used

| | |
|-----------------|--------|
| Dictionary name | MedDRA |
|-----------------|--------|

| | |
|--------------------|------|
| Dictionary version | 20.0 |
|--------------------|------|

Reporting groups

| | |
|-----------------------|-----------------|
| Reporting group title | E-cigarette AEs |
|-----------------------|-----------------|

Reporting group description: -

| | |
|-----------------------|---------------|
| Reporting group title | Inhalator AEs |
|-----------------------|---------------|

Reporting group description: -

| Serious adverse events | E-cigarette AEs | Inhalator AEs | |
|---|-----------------|----------------|--|
| Total subjects affected by serious adverse events | | | |
| subjects affected / exposed | 0 / 51 (0.00%) | 0 / 51 (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 | E-cigarette AEs | Inhalator AEs | |
|---|------------------|------------------|--|
| Total subjects affected by non-serious adverse events | | | |
| subjects affected / exposed | 30 / 51 (58.82%) | 34 / 51 (66.67%) | |
| Cardiac disorders | | | |
| Dyspnoea | | | |
| subjects affected / exposed | 8 / 51 (15.69%) | 6 / 51 (11.76%) | |
| occurrences (all) | 8 | 6 | |
| Dyspnoea at rest | | | |
| subjects affected / exposed | 5 / 51 (9.80%) | 2 / 51 (3.92%) | |
| occurrences (all) | 5 | 2 | |
| Chest pain | | | |
| subjects affected / exposed | 6 / 51 (11.76%) | 4 / 51 (7.84%) | |
| occurrences (all) | 6 | 4 | |
| Chest discomfort | | | |

| | | | |
|--|----------------------|---------------------|--|
| subjects affected / exposed occurrences (all) | 7 / 51 (13.73%) 7 | 3 / 51 (5.88%) 3 | |
| Nervous system disorders | | | |
| Dizziness | | | |
| subjects affected / exposed | 9 / 51 (17.65%) | 9 / 51 (17.65%) | |
| occurrences (all) | 9 | 9 | |
| Headache | | | |
| subjects affected / exposed | 10 / 51 (19.61%) | 9 / 51 (17.65%) | |
| occurrences (all) | 10 | 9 | |
| Sleep disturbance | | | |
| subjects affected / exposed | 7 / 51 (13.73%) | 5 / 51 (9.80%) | |
| occurrences (all) | 7 | 5 | |
| Eye disorders | | | |
| Visual impairment | | | |
| subjects affected / exposed | 4 / 51 (7.84%) | 2 / 51 (3.92%) | |
| occurrences (all) | 4 | 2 | |
| Gastrointestinal disorders | | | |
| Nausea | | | |
| subjects affected / exposed | 7 / 51 (13.73%) | 11 / 51 (21.57%) | |
| occurrences (all) | 7 | 11 | |
| Respiratory, thoracic and mediastinal disorders | | | |
| Wheezing | | | |
| subjects affected / exposed | 7 / 51 (13.73%) | 8 / 51 (15.69%) | |
| occurrences (all) | 7 | 8 | |
| Cough | | | |
| subjects affected / exposed | 14 / 51 (27.45%) | 18 / 51 (35.29%) | |
| occurrences (all) | 14 | 18 | |
| Productive cough | | | |
| subjects affected / exposed | 12 / 51 (23.53%) | 9 / 51 (17.65%) | |
| occurrences (all) | 12 | 9 | |
| Psychiatric disorders | | | |
| Disturbance in attention | | | |
| subjects affected / exposed | 9 / 51 (17.65%) | 15 / 51 (29.41%) | |
| occurrences (all) | 9 | 15 | |

More information

Substantial protocol amendments (globally)

Were there any global substantial amendments to the protocol? Yes

| Date | Amendment |
|----------------|---------------|
| 23 August 2012 | Change to PI. |

Notes:

Interruptions (globally)

Were there any global interruptions to the trial? No

Limitations and caveats

None reported