ISRCTN50895907 https://doi.org/10.1186/ISRCTN50895907

A double-blinded randomised controlled trial of the effects of sodium citrate on olfactory thresholds

Submission date
28/09/2007

Recruitment status
No longer recruiting

Registration date
28/09/2007

Overall study status
Completed

Last Edited
06/07/2017

Condition category
Ear, Nose and Throat

[X] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims
Hyposmia is a relatively common condition where a person has a reduced sense of smell. Previous studies have shown that a chemical called sodium citrate can improves hyposmia by decreasing mucus calcium levels in the nose. The theory behind these effects relates to calcium ions (positively charged calcium atoms) and their role on olfactory receptor neurons (nerve cells in the nose that detect smell). A reduction in free calcium ions (Ca2+) is likely to make these olfactory neurons more active and therefore improve the sense of smell. The aim of this study is to find out whether spraying a sodium citrate solution into the nose of people with hyposmia is able to improve that person's sense of smell.

Who can participate?
People with a reduced sense of smell (hyposmia)

What does the study involve?
At the start of the study, all participants complete a number of questionnaires and provide information about themselves. They then undertake a series of smell tests using increasing concentrations of four odours in 250ml bottles. Participants are then randomly allocated to one of two groups. Those in the first group use a nose spray containing sodium citrate (9% concentration) and those in the second group use a nose spray with sterile water. Participants then redo the smell tests with the different odour bottles every 15 minutes for two hours.

What are the possible benefits and risks of participating?
It is expected that some patients may benefit from a temporary improvement in their sense of smell after using the citrate spray. Risks of participating are small. The process of spraying the nose should be neither unpleasant nor painful, but some patients may find they want to sneeze. They may also experience some irritation after application of the spray.

Where is the study run from?
1. James Paget University Hospital (UK)
2. Ipswich Hospital (UK)

When is the study starting and how long is it expected to run for?
January 2015 to June 2016

Who is funding the study?
James Paget University Hospital (UK)

Who is the main contact?
Mr Carl Philpott
C.Philpott@uea.ac.uk

Contact information

Type(s)
Scientific

Contact name
Mr Carl Philpott

ORCID ID
http://orcid.org/0000-0002-1125-3236

Contact details
Norwich Medical School
University of East Anglia
Norwich
United Kingdom
NR4 7TJ
+44 1603 591105
C.Philpott@uea.ac.uk

Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers
N0274185293

Study information

Scientific Title
A double-blinded randomised controlled trial of the effects of sodium citrate on olfactory thresholds

Study objectives

Does the application of sodium citrate to the nose improve the ability to smell of patients with a poor sense of smell when compared with a placebo?

Ethics approval required
Old ethics approval format

Ethics approval(s)
Added September 2008: Eastern Reseach Ethics Committee (UK), 15/06/2006, ref: 06/MRE05/16

Study design
Randomised controlled trial

Primary study design
Interventional

Secondary study design
Randomised controlled trial

Study setting(s)
Hospital

Study type(s)
Treatment

Participant information sheet
Not available in web format, please use the contact details below to request a patient information sheet

Health condition(s) or problem(s) studied
Ear, Nose and Throat: Smell ability

Interventions
Current interventions as of 19/02/2013:
The study will be undertaken at the ENT department of the Leicester Royal Infirmary and in a research laboratory at the University of Leicester and also in the ENT department at the James Paget University Hospital. Fifty subjects will be recruited. Subjects will be invited to undergo a series of smell tests using graded concentrations of 4 odours in 120ml bottles (1). This test has been described and validated by our previous work (2). The test will be fully explained to the subject beforehand by the researcher who will test the patient. The subject will be started with the smallest concentration of each odour and will ascend through the bottles until they detect 2 in a row, at which point the weaker concentration of the odour will be taken as their threshold. They will have a threshold levels determined for the odours phenethyl alcohol (roses), 1-butanol (pear-like), acetic acid (vinegar) and eucalyptol (menthol).

Then, the subject will then have either 1cm3 sodium citrate 9% or sterile water (half per nostril) sprayed into the nose. Patients will be randomly allocated to one of the two groups using a coded bottle system controlled by the pharmacies at both sites. Both patient and tester will be blinded to the solution used as these will be made in the pharmacy and coded for anonymity - the code will be broken at the end of the trial. Subjects will then be retested with the bottles and threshold levels will be observed for the four odours at 15 minute intervals over 2 hours.

The purpose of the repeated tests is to determine the length of the effect (if present) of the citrate on the olfactory ability of the patients (NB: sodium citrate is a licensed product for use in body cavities (e.g. stomach, bladder) and can be found in the British National Formulary - the concentrations proposed do not exceed those used elsewhere).

Previous interventions until 19/02/2013:
The study will be undertaken at the ENT department of the Leicester Royal Infirmary and in a research laboratory at the University of Leicester and also in the ENT department at the West Suffolk Hospital. One hundred subjects will be recruited. Subjects will be invited to undergo a series of smell tests using graded concentrations of 4 odours in 120ml bottles (1). This test has been described and validated by our previous work (2). The test will be fully explained to the subject beforehand by the researcher who will test the patient. The subject will be started with the smallest concentration of each odour and will ascend through the bottles until they detect 2 in a row, at which point the weaker concentration of the odour will be taken as their threshold. They will have a threshold levels determined for the odours phenethyl alcohol (roses), mercaptan (gas), acetic acid (vinegar) and eucalyptol (menthol).

Then, the subject will undergo a sodium citrate nasal douche at a specific concentration or will douche with sterile water. There will be three concentrations used (3%, 6% and 9%) and a control solution (sterile water). Patients will be randomly allocated to one of the four groups using a coded bottle system. Both patient and tester will be blinded to the solution used as these will be made in the pharmacy and coded for anonymity - the code will be broken at the end of the trial. Subjects will then be retested with the bottles and threshold levels will be observed for the four odours at 15 minute intervals over 2 hours. The purpose of the repeated tests is to determine the length of the effect (if present) of the citrate on the olfactory ability of the patients (NB: sodium citrate is a licensed product for use in body cavities (e.g. stomach, bladder) and can be found in the British National Formulary - the concentrations proposed do not exceed those used elsewhere).

Intervention Type
Drug

Phase
Not Specified

Drug/device/biological/vaccine name(s)
Sodium Citrate

Primary outcome measure
Primary outcome measure as 29/07/2016:
Olfactory threshold for PEA odour is measured using a psychophysical test (two-alternative forced choice ascending ladder technique) at baseline and 15 minute intervals up to 2 hours maximum.

Original primary outcome measure:
An improvement in their sense of smell and their general well-being.

Secondary outcome measures

Secondary outcome measure as of 29/07/2016:
Olfactory thresholds for ACA, EUC and BUT odours are measured using a psychophysical test (two-alternative forced choice ascending ladder technique) at baseline and 15 minute intervals up to 2 hours maximum.

Secondary outcome measures added as of 19/02/2013:
A subjective improvement in their sense of smell and their general well-being

Overall study start date
01/01/2015

Completion date
30/06/2016

Eligibility

Key inclusion criteria
All patients with an objective reduction in their ability to smell.

Participant type(s)
Patient

Age group
All

Sex
Both

Target number of participants
100

Key exclusion criteria
Current inclusion criteria as of 19/02/2013:
1. Patients who are proven to have a normal sense of smell
2. Patients with nasal polyps or other sinonasal disease

Previous inclusion criteria until 19/02/2013:
1. Patients who are proven to have a normal sense of smell
2. Patients with nasal polyps

Date of first enrolment
11/08/2008

Date of final enrolment
01/08/2009

Locations

Countries of recruitment
England

United Kingdom

Study participating centre
James Paget University Hospital
Lowestoft Road
Gorleston-on-Sea
Great Yarmouth
Norfolk
United Kingdom
NR31 6LA

Study participating centre
Ipswich Hospital
Heath Road
Ipswich
United Kingdom
IP4 5PD

Sponsor information

Organisation
University Hospitals of Leicester NHS Trust (UK)

Sponsor details
University Hospitals of Leicester NHS Trust Headquarters
Level 3, Balmoral Building
Leicester Royal Infirmary
Infirmary Square,
Leicester
England
United Kingdom
LE1 5WW

Sponsor type
Hospital/treatment centre

Website
http://www.leicestershospitals.nhs.uk/

ROR
https://ror.org/02fha3693

Funder(s)

Funder type
Hospital/treatment centre

Funder Name
James Paget University Hospital

Results and Publications

Publication and dissemination plan
Planned publication in Rhinology journal.

Intention to publish date
31/12/2016

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	01/12/2017		Yes	No