ISRCTN49416618 https://doi.org/10.1186/ISRCTN49416618

Taurine and painful diabetic neuropathy

Submission date
12/12/2007

Recruitment status
No longer recruiting

Registration date
14/03/2008

Overall study status
Completed

Last Edited
17/01/2017

Condition category
Nervous System Diseases

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[ ] Record updated in last year

Plain English summary of protocol

Background and study aims
Diabetes is often complicated by the development of diabetic nerve disease (neuropathy). Diabetic neuropathy affects nerves that are outside of the brain and spinal cord, such as nerves in the arms, legs, hands and feet. Symptoms of diabetic neuropathy may include pain, such as a feeling of burning, prickling, tingling, aching, pins and needles usually occurring on both sides of the body affecting hands, legs or feet. Some patients may not be able to distinguish between sharp and dull and hot and cold (altered sensation).
The aim of the study is to find out whether neuropathic pain in painful diabetic neuropathy is relieved by taking a tablet called taurine. Taurine occurs naturally in the body and it is thought that patients with painful diabetic neuropathy have less taurine in their body. By increasing the level of taurine in the body it is hoped that patients will experience less pain. This in turn may have the added benefit of improving quality of life.

Who can participate?
180 patients from Diabetic Clinics at Heartlands and Solihull (UK) will be invited to take part in this study. You are eligible to take part if you have developed the complication of diabetes known as neuropathy and are 18-70 years old.

What does the study involve?
The patients will be randomly split into two groups. One group will receive the experimental drug and the second group will receive a dummy (placebo). Patients will be asked to attend a study visit to determine whether they are suitable to take part in this study. Tests will include a physical assessment (such as blood pressure and weight). An electrocardiogram (a painless test that records the electrical activity of your heart) will be performed. You will also have tests to determine the extent of your neuropathy, including your response to vibratory stimulation (tuning fork), cold detection (the difference between hot and cold) and comparisons made between areas on your body where you have pain and where you dont. You will have an Autonomic Nerve Function Test performed on you. The test is painless and helps the study doctor decide whether you have neuropathy. You will be requested to attend the clinic for monthly physical assessments, collection of pain diaries and collection of the study drug to measure compliance. At three months a physical assessment will be performed including the above mentioned assessments of neuropathy. At a second visit, the pain and sleep diaries will be collected and any adverse events recorded. The questionnaires will again be administered and the experimental drug collected to measure compliance to the study. Four weeks after the study

is completed, you will be contacted to assess how you are feeling now that the study drug has been stopped.

What are the possible benefits and risks of participating?
We hope that the treatment will help the pain in your feet. However, this cannot be guaranteed. The information we get from this study may help us to treat future patients with painful diabetic neuropathy more effectively.

Where is the study run from?
The majority of the visits will be held at Heart of England NHS Foundation Trust, and at least two visits will be completed at the Queen Elizabeth Hospital, Birmingham (UK).

When is the study starting and how long is it expected to run for?
October 2006 to December 2014

Who is funding the study?
National Institutes of Health (USA)

Who is the main contact?
Prof. Martin J. Stevens,
m.j.stevens@bham.ac.uk

Contact information

Type(s)
Scientific

Contact name
Prof Martin J. Stevens

Contact details
University of Birmingham
The Medical School
Institute for Biomedical Research
Edgbaston
Birmingham
United Kingdom
B45 8PF
+44 (0)121 414 8162
m.j.stevens@bham.ac.uk

Additional identifiers

Protocol serial number
RG 05-126

Study information

Scientific Title
Taurine and painful diabetic neuropathy

Study objectives
Our overall hypothesis is that taurine depletion contributes to the development of painful Diabetic Neuropathy (DN). The rationale is based on:
a. Evidence implicating oxidative stress, altered neuronal calcium signaling and neuronal hyperexcitability in the development of painful DN
b. The emerging role of taurine as an important endogenous antioxidant, calcium regulator, neurotrophin, modulator of neuronal hyperexcitability and analgesic
c. Our data implicating a critical role for taurine depletion and oxidative stress in the pathogenesis of experimental DN.
The experimental approach will be to utilize biochemical and electrophysiological techniques to evaluate the potential of taurine treatment alone to decrease pain in patients with DN. These studies will test a novel mechanistically-based therapeutic approach to a common disabling and often refractory complication of diabetes.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Leeds (East) Research Ethics Committee, 22/09/2006

Primary study design
Interventional

Study design
Randomised blinded parallel two-group clinical study

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Diabetic neuropathy

Interventions
Taurine 3,000 mg/day (3 capsules) orally vs placebo 3 capsules daily for 12 weeks

Intervention Type
Drug

Phase
Not Specified

Drug/device/biological/vaccine name(s)
Taurine

Primary outcome(s)
1. Pain perception is measured using the Short-Form McGill-Melzack Pain Questionnaire (SF-MMPQ), a Visual Analogue Scale (VAS) and a Present Pain rating Intensity index (PPI) at baseline, 4, 8 and 12 weeks

2. Pain is measured using daily pain diaries, recorded for 12 weeks.
3. Physician and Patient Global Assessment of Change, assessed at 12 weeks post inclusion into the study (final assessment)

Key secondary outcome(s)
1. Sleep is measured using the Mean Sleep Interference Score on a daily basis upon awakening
2. Mean Pain Scores are measured using daily diaries which comprise an 11-point Likert-type scale which ranges from 0 (no pain) to 10 (worst possible pain) upon awakening
3. Change in the subjects overall status is measured using the Clinical and Patient Global Impression of Change at baseline, 4, 8 and 12 weeks

Completion date
01/12/2014

Eligibility

Key inclusion criteria
1. Type 1 or type 2 diabetes as defined by the World Health Organization Classification
2. Duration of diabetes of at least 5 years
3. The HbA1c should be <10.5% with <1% fluctuation of HbA1c levels over the past 6 months
4. Age between 18 and 80 years
5. Women of childbearing potential must be using an acceptable method of contraception to prevent pregnancy when they are enrolled in the study and must agree to continue to practice an acceptable method of contraception for the duration of their participation in the study
6. Must meet the specified criteria for painful DN and have no risk factors for other causes for neuropathy
7. Willingness to sign the Center for Research Ethics Committee (COREC) approved informed consent form

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 Years

Sex
All

Key exclusion criteria
1. Nursing mothers, pregnant women (excluded by a negative pregnancy test)
2. Patients with a history of drug or alcohol dependence in the last 5 years
3. Patients with pre-existing cardiovascular disease
4. Patients with hypoxemic disease
5. Patients with severe systemic disease other than diabetes which has as a recognized

complication neuropathy or severe chronic pain
6. Patients with symptoms of neuropathic pain in the upper limbs alone
7. Significant changes in skin conditions in the areas to be tested which could alter sensation
8. Subjects with a previous history of neuropathic foot ulceration or Charcot arthropathy
10. Patients currently taking medications that could affect symptoms of painful DN except paracetamol (up to 4 g/d) or aspirin (up to 325 mg/d)
11. Patients experiencing an increase in pain after analgesic medication washout to levels which would, in the view of the PI, require prohibited analgesic therapy within a 12 week period
12. Patients whose creatinine clearance is less than 70 ml/min or have significant hepatic disease (Aspartate aminotransferase [AST], alanine aminotransferase [ALT], y-GT >2 times upper limit of normal)
13. Patients with thyroid stimulating hormone (TSH) outside normal limits
14. Patients with a history of previous kidney, pancreas or cardiac transplantation
15. Serious or unstable medical or psychological state that may interfere with study participation
16. Patients having taken other systemic investigational drugs (especially for neuropathy) or initiating a new or experimental insulin delivery device within 3 months of starting the study
17. Morbidly obese patients (Body Mass Index [BMI] greater than 40)
18. Patients who refuse to sign the informed consent

Date of first enrolment
01/10/2006

Date of final enrolment
01/12/2014

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
University of Birmingham
Birmingham
United Kingdom
B45 8PF

Sponsor information

Organisation
University of Birmingham (UK)

ROR
https://ror.org/03angcq70

Funder(s)

Funder type
Government

Funder Name
National Institutes of Health (USA)

Alternative Name(s)
US National Institutes of Health, Institutos Nacionales de la Salud, NIH, USNIH

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United States of America

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary