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Evaluation of the effect of choline-stabilized orthosilicic acid on the symptoms of knee osteoarthritis

Submission date
04/09/2020

Recruitment status
No longer recruiting

Registration date
15/09/2020

Overall study status
Completed

Last Edited
30/12/2021

Condition category
Musculoskeletal 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
Osteoarthritis is a slowly progressive degenerative disease in which the joint cartilage gradually wears away. Choline-stabilized orthosilicic acid was previously found to stimulate the formation of bone collagen in patients with osteopenia and to improve signs of cartilage degradation in knee osteoarthritis. Furthermore, several consumer testimontials report improvements in joint-related problems (i.e. stiffness, pain) after taking choline-stabilized orthosilicic acid supplements. The aim of this study is to investigate the long-term effect of oral administered choline-stabilized orthosilicic acid on symptoms of knee osteoarthritis during a treatment period of 9 months.

Who can participate:
Patients between the ages of 18 and 75 years old with documented knee osteoarthritis

What does the study involve?
Patients are randomly allocated to either receive choline-stabilized orthosilicic acid or placebo. All patients will be instructed to take two capsules daily for 36 weeks. Assessments will be done during the screening visit, at baseline and after 2, 6, 12, 18, 24 and 36 weeks of treatment. These assessments involve radiography, questionnaires, blood and urine analysis. If necessary, rescue medication in the form of paracetamol (up to 2 g/day) is permitted up to 48 hours before the baseline visit and other study visits.

What are the possible benefits and risks of participating?
Choline-stabilized orthosilicic acid influences bone formation by affecting cartilage composition and calcification, which may reduce knee osteoarthritis symptoms. Considering the available information about choline-stabilized orthosilicic acid, there are no foreseeable risks to human health when used as instructed.

Where is the study run from?
Bio Minerals NV (Belgium)

When is the study starting and how long is it expected to run for?
July 2014 to December 2018

Who is funding the study?
Bio Minerals NV (Belgium)

Who is the main contact?
Prof. Piet Geusens
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Contact information

Type(s)
Public

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Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

ClinicalTrials.gov (NCT)
Nil known

Protocol serial number
14/1, B009201525792

Study information

Scientific Title
A randomized, double-blind placebo-controlled, single-joint study to assess the long term (9 months) effect of choline-stabilized orthosilicic acid on symptoms of knee osteoarthritis

Study objectives

The aim of this study is to investigate the long-term symptomatic effects of oral intake of choline-stabilized orthosilicic acid over a 9 month period on the clinical symptoms of knee osteoarthritis.

Ethics approval required
Old ethics approval format

Ethics approval(s)
1. Approved 14/10/2015, Commissie voor Medische Ethiek ZNA/Commission for Medical Ethics ZNA (Lindendreef 1, 2020 Antwerpen, Belgium; +32 (0)3 280 34 29; ethische.commissie@zna.be), ref: B009201525792
2. Approved 26/01/2016, Eticka komise Revmatologického ustavu/Ethics Committee Rheumatology constitution (Na Slupi 4, 125 50 Praha 2, Czech Republic; no tel number; eticka@revma.cz), ref: 906/2016

Study design
Multi-center double-blind randomized placebo-controlled phase III study

Primary study design
Interventional

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Knee osteoarthritis

Interventions
Participants are randomized to either the placebo or active treatment group (choline-stabilized orthosilicic acid) using block randomization in a ratio of 1:1.

All participants will be instructed to take daily for 9 months, two capsules orally of either placebo (520 mg microcrystalline cellulose beadlets), or the active ingredient (520 mg beadlets containing 5 mg of silicon and 100 mg of choline in the form of choline-stabilized orthosilicic acid).

The trial starts with a screening visit and a wash-out period during which the use of knee-osteoarthritis medication is not permitted.

Assessments will be done respectively at inclusion (baseline) and after 2, 6, 12, 18, 24 and 36 weeks.

Intervention Type
Supplement

Primary outcome(s)
The sum of physical function, stiffness and pain scores measured using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) total index at baseline and 36 weeks

Key secondary outcome(s))

1. The sum of functional, stiffness and pain scores measured using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) total index at baseline, 2, 6, 12, 18, 24 and 36 weeks
2. Pain scores measured using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) pain subscale at baseline, 2, 6, 12, 18, 24 and 36 weeks
3. Physical function scores measured using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) physical function subscale at baseline, 2, 6, 12, 18, 24 and 36 weeks
4. Stiffness scores measured using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) stiffness subscale at baseline, 2, 6, 12, 18, 24 and 36 weeks
5. The subject's global assessment of response to treatment measured using a visual analogue scale 100 mm at baseline, 2, 6, 12, 18, 24 and 36 weeks
6. Paracetamol intake measured using a diary and counting the remaining medication at 2, 6, 12, 18, 24 and 36 weeks
7. Biomarkers of collagen type II degradation and cartilage oligomeric matrix measured in serum and urine samples taken at baseline, 2, 6, 12, 18, 24 and 36 weeks
8. Response to treatment, defined by the OsteoArthritis Research Society International (OARSI) and Outcome Measures in Rheumatology Group (OMERACT) committees as at least 50% (or absolute score of 20) improvement in pain scores or improvement in at least two of the three following: at least 20% (or absolute score of 10) improvement in pain scores, at least 20% (or absolute score of 10) improvement in physical function scores, at least 20% (or absolute score of 10) improvement in subjects global assessment. The pain and physical function score scores are measured using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) pain and physical function subscores. The subject's global assessment is measured using a 100 mm VAS score
9. Response to treatment, defined as 30% decrease in pain scores measured using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) pain subscale at baseline, 2, 6, 12, 18, 24 and 36 weeks

Completion date
19/12/2018

Eligibility

Key inclusion criteria
1. Provision of written informed consent
2. Males and females between the ages of 18 and 75 years old
3. Females must use an approved form of birth control or be postmenopausal or be surgically sterile
4. OA of the knee as confirmed by radiography (weight-bearing, anteroposterior radiograph of the target knee: Kellgren and Lawrence grade II and III) during the screening visit or by a recent radiograph (<6 months before baseline)
5. OA of one or both knees prior to administration of study dietary supplement based on the American College of Rheumatology criteria23:
5.1. Knee pain for most days of previous month
5.2. Osteophytes at joint margins on radiographs
5.3. Age >50 years
5.4. Crepitus on active joint motion
5.5. Morning stiffness lasting <30 min
Criteria 1 and 2 have to be present plus one of the following: 3, 4, 5
6. Symptomatic, target knee with OA pain intensity score on a 5-point Likert Scale of “moderate

(2)" or "moderately severe (3)" after withdrawal of analgesic/anti-inflammatory medications. In the case that both knees have a pain score of "moderate (2)" or "moderately severe (3)", the knee with the highest pain score is chosen as the target knee
7. Participant must continue his/her normal physical activities during the study i.e. there should be no change in physical activity after the screening visit
8. WOMAC functional subscale score of > 0
9. Physically active: Steinbrocker Class I - III

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 years

Sex
All

Total final enrolment
227

Key exclusion criteria
1. Participant unable to understand the study procedures and/or not having given written informed consent and/or not wishing to participate in one of the subsequent therapeutic intervention protocols
2. Poor general health interfering with compliance or assessment
3. Unlikely to co-operate fully in the study
4. Participating in another clinical trial in the last 90 days
5. Pregnancy or breastfeeding
6. Morning stiffness >30 minutes in duration
7. Subjects with a swollen or warm joint thought to be secondary to gout, pseudogout or sepsis
8. Active rheumatoid arthritis
9. Paget's disease of bone, articular fracture, major dysplasias or congenital abnormality, ochronosis, acromegaly, hemachromatosis, Wilson's disease and primary osteochondromatosis
10. Significant injury to the target joint within 6 months of trial start
11. Disease of the spine or lower extremity joints of sufficient degree to affect the assessment of the target joint
12. New physical activity i.e. physical activity which was not present prior to the screening visit
13. Recent or current alcohol abuse (consumption levels of more than 28 units 25per week) and drug abuse
14. Arthroplasty in the target knee and joint surgery of the target knee within 2 years prior to the start of the study
15. Participants who have received chondrocyte transplants in any lower extremity joint
16. Participants who belong in a high-risk group for HIV
17. Clinically significant medical abnormalities which would make the subject unsuitable for the study as judged by the investigator

18. Participant has renal failure, documented history of stroke, myocardial infarct or cancer
19. Concomitant and previous medication:
19.1. Less than 28 days between the topical or systemic treatment with hyaluronic acid, glucosamine sulphate, glucosamine HCl, n-acetyl glucosamine and derivatives thereof such as chondroitin sulphate, glycosaminoglycans and the start of the study
19.2. Less than 3 months between the treatment with a slow-acting drug for symptom relief and the start of the study
19.3. Participants who have used previous topical and/or systemic treatment with NSAIDs or analgesics, different from paracetamol, such asibuprofen, diclofenac, acetyl salicylic acid, piroxicam and indomethacin in a 14 days period prior to the start of the study
19.4. Participants who have used medications with MMP-inhibitory properties (e.g. tetracyclines or structurally related compounds), or took oral (systemic, > 10 days duration) glucocorticoids in a 28 days period prior to start of the study
19.5. Participants who have used compounds containing agents claiming to possess disease /structure modifying properties (e.g. diacerhein) in a 28 days period prior to the start of the study
19.6. Participants who received intra-articular injections in the target knee of glucocorticoids within 3 months of the start of the study or any other injection (e.g. hyaluronic acid) within 6 months prior to the start of the study
19.7. Concomitant and previous supplementation with food supplements containing horsetail extract, bamboo extract, silicic acid or silanol derivatives within 3 months of the start of the study
20. Steinbrocker Class IV
21. Chronic use of analgesics

Date of first enrolment
30/03/2016

Date of final enrolment
11/04/2018

Locations

Countries of recruitment
Belgium

Czech Republic

Study participating centre
ReumaClinic Genk
Bretheistraat 149
Genk
Belgium
3600

Study participating centre

Institute of Rheumatology
Na Slupi 4
Prague
Czech Republic
128 50

Study participating centre
Medical Plus s.r.o.
Obchodni 1507
Uherske Hradiste
Czech Republic
68601

Sponsor information

Organisation
Bio Minerals NV

Funder(s)

Funder type
Industry

Funder Name
Bio Minerals NV

Results and Publications

Individual participant data (IPD) sharing plan
The data-sharing plans for the current study are unknown and will be made available at a later date.

IPD sharing plan summary
Data sharing statement to be made available at a later date

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes