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Fractures and Bisphosphonates: does osteoporosis treatment affect fracture healing?

Submission date	Recruitment status	[X] Prospectively registered
16/05/2011	No longer recruiting	[_] Protocol
Registration date	**Overall study status**	[_] Statistical analysis plan
22/06/2011	Completed	[X] Results
Last Edited	**Condition category**	[_] Individual participant data
12/04/2019	Musculoskeletal Diseases	

Plain English summary of protocol
Not provided at time of registration

Contact information

Type(s)
Scientific

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Additional identifiers

Protocol serial number
19403

Study information

Scientific Title
Fractures and Bisphosphonates: a double-blind, randomised controlled trial on the effect of alendronic acid on healing and clinical outcomes in wrist fractures

Acronym

FaB

Study objectives
Bisphosphonates are widely used in the treatment of osteoporosis. Although fractures often occur in patients with osteoporosis who are on bisphosphonate therapy, the effects of bisphosphonates on fracture healing have not been adequately studied in humans. Sometimes bisphosphonates are withheld because of the theoretical concern about an adverse effect on fracture healing, but sometimes bisphosphonate therapy is continued. It remains unclear whether early treatment might be advantageous or deleterious to fracture healing and clinical outcome.

This study will investigate the effect of alendronic acid on radiological fracture healing in the context of a randomised placebo controlled trial. Patients aged 50 and over who have fractured their wrist and are not on bisphosphonate therapy will be invited to take part in the study.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Fife and Forth Valley REC, 03/08/2011

Study design
Double-blind randomised controlled multicentre study

Primary study design
Interventional

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Fracture healing

Interventions
Participants are allocated to receive either 70mg alendronic acid or placebo once-weekly for 24 weeks. It will be compared against a matched placebo. Participants will take study medication for 24 weeks

Intervention Type
Drug

Phase
Not Applicable

Drug/device/biological/vaccine name(s)
Alendronic acid

Primary outcome(s)
1. Comparing the fracture healing between both arms at 4 weeks using X-rays
2. Fractures will be defined as healed when the following features are present:
2.1. Bridging of three out of four cortices

2.2. Radiographic evidence of endosteal healing
2.3. Organised trabecular bridging
3. Also, a time to event analysis will also be performed to evaluate the trajectory of fracture healing from radiographs taken at 2, 4, 6 and 8 weeks

Key secondary outcome(s))
1. Upper limb function will be assessed by using the Disabilities of the Arm, Shoulder and Hand (DASH) Outcome Measure
2. The DASH is a validated 30-item questionnaire which has previously been shown to detect changes of disability over time after injury or surgery in patients with upper-extremity musculoskeletal disorders
3. The effect of alendronate on the DASH score during the trial will be measured by comparing the change in DASH score from initial fracture to each timepoint (baseline, 2, 4, 6, 8 and 26 weeks) for both treatment groups
4. Complex Regional Pain Syndrome type I will be assessed at weeks 6 and 26 using the clinical Budapest Criteria
5. Pain will be assessed using an 11 point (0-10) Numeric Rating Scale (NRS) and by recording the amount of analgesia used in the 24 hours prior to questioning
6. Participants will be asked rank their pain from 0 (no pain) to 10 (worst pain imaginable) 7. The difference in pain and analgesia use at baseline, weeks 2, 4, 6, 8, and 26 will be compared between both treatment groups
8. Active range of movement (AROM) and grip strength of both the affected and unaffected hand will be measured at weeks 8 and 26, using a goniometer and hand dynamometer respectively
9. The differences between the range of movement and grip strength in each hand will be used to compare the two treatment groups

Completion date
29/09/2013

Eligibility

Key inclusion criteria
Current inclusion criteria as of 19/09/2012:
1. Patients (male and female) aged 50 years and over
2. Patients must have suffered a distal radial fracture confirmed by X-ray radiograph
3. The distal radial fracture must be:
3.1. Unilateral extra-articular or minimal articular
3.2. Displaced or un-displaced
3.3. Treated with cast/splint, external fixation or open reduction and internal fixation
4. Patients willing and able to consent and comply with study protocol

Previous inclusion criteria until 19/09/2012:
3.3. Treated with cast, external fixation or open reduction and internal fixation

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Sex
All

Total final enrolment
421

Key exclusion criteria
Current exclusion criteria as of 19/09/2012:
1. Any of the following:
1.1. current or previous use of zoledronic acid
1.2. current or previous use within the last 2 years of any other bisphosphonate
1.3. current or previous use within the last 6 months of strontium ranelate, calcitonin, denosumab, parathyroid hormone (PTH) or intravenous (IV), intramuscular (IM) and oral corticosteroids (inhaled corticosteroids such as asthma inhalers are acceptable)
2. Previous distal radial fracture on affected side
3. Bilateral distal radial fracture
4. Contraindications to alendronic acid, including but not limited to:
4.1. Abnormalities of the oesophagus and other factors which delay oesophageal emptying such as stricture or achlasia
4.2. Inability to stand or sit upright for at least 30 minutes
4.3. Hypersensitivity to alendronate or any of its excipients
4.4. Known hypocalcaemia
4.5. Known renal impairment
5. Women of childbearing potential not using adequate contraception
6. Pregnancy
7. The distal radial fracture is due to other pathologies e.g. Pagets Disease of Bone, metastatic bone disease etc.

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2. Previous distal radial fracture on affected side
3. Bilateral distal radial fracture
4. Contraindications to alendronic acid, including but not limited to:
4.1. Abnormalities of the oesophagus and other factors which delay oesophageal emptying such as stricture or achlasia
4.2. Inability to stand or sit upright for at least 30 minutes
4.3. Hypersensitivity to alendronate or any of its excipients
4.4. Hypocalcaemia at baseline (serum adjusted calcium <2.2mmol/l)
4.5. Renal impairment at baseline [estimated glomerular filtration rate (eGFR) less than 35ml /min as assessed by the Modification of Diet in Renal Disease (MDRD) formula]
5. Women of childbearing potential not using adequate contraception
6. Pregnancy

Date of first enrolment
02/04/2012

Date of final enrolment
29/09/2013

Locations

Countries of recruitment
United Kingdom

Scotland

Study participating centre
University of Edinburgh
Edinburgh
United Kingdom
EH4 2XU

Sponsor information

Organisation
University of Edinburgh (UK)

ROR
https://ror.org/01nrxwf90

Funder(s)

Funder type
Charity

Funder Name
Arthritis Research UK (UK) (ref no 19403)

Alternative Name(s)

Funding Body Type
Private sector organisation

Funding Body Subtype
Other non-profit organizations

Location
United Kingdom

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?
Results article	results	01/06/2019	12/04/2019	Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes