

[18F]Fluoride PET-CT imaging for detection and monitoring of bone formation in spondyloarthritis

No registrations found.

Ethical review	Positive opinion
Status	Recruiting
Health condition type	-
Study type	Observational non invasive

Summary

ID

NL-OMON23538

Source

Nationaal Trial Register

Brief title

Fluoride PET studie

Health condition

Ankylosing spondylitis, psoriatic arthritis

Sponsors and support

Primary sponsor: Novartis, Foreum, Pfizer

Source(s) of monetary or material Support: Novartis, Foreum, Pfizer

Intervention

Outcome measures

Primary outcome

Our main endpoint is [18F]Fluoride uptake changes on whole body PET-CT scans during treatment of 40 SpA patients in relation to clinical follow-up of treatment.

Secondary outcome

Our secondary endpoint is the histological analysis of samples taken by PET-guided bone biopsies from 8 clinically active AS patients.

Study description

Background summary

One of the hallmarks of disease activity in spondyloarthritis (SpA), a spectrum of rheumatological diseases including ankylosing spondylitis (AS) and psoriatic arthritis (PsA), is new bone formation. Enthesitis and bone formation are related to functional disability on the long term. SpA is a complex disease, as evidenced by the involvement of axial and peripheral articular structures, extra-articular manifestations, presence of co-morbidities such as osteoporosis and vascular inflammation and the histopathological combination of inflammation, tissue destruction, and new tissue formation. Mechanistic understanding of which 'targetable' pathways steer these different disease manifestations is required to optimize and tailor treatment to all these different facets of the disease.

Both TNF α and IL-17 are pivotal pathogenic cytokines in SpA. Therapeutic inhibition of each of these cytokines leads to both significant improvement of clinical symptoms and suppression of inflammation in SpA. Studies show that anti-TNF decreases inflammatory activity, and may inhibit progression of bone formation after longer use. Anti-IL-17 treatment, such as Secukinumab, has a very promising profile to inhibit not only inflammatory activity, but potentially also bone formation.

In order to investigate therapeutic effects of Secukinumab on enthesitis and related bone formation, sensitive imaging techniques are required for monitoring early in the course of treatment. Conventional X-rays and CT-scans still play an important role for determination and monitoring of structural damage, but these techniques have limitations. CT-scans do not allow assessment of the whole skeleton in one imaging session, and X-rays are more suited to provide information on long-term changes in bone formation. Both MRI and ultrasound (US) can be applied for evaluation of inflammatory activity, however US is limited to more superficial, peripheral sites that are accessible by this technique, and MRI is less sensitive for bone formation imaging in SpA.

Positron emission tomography (PET) is a promising alternative for bone formation imaging. The technique allows sensitive and quantitative imaging of functional tissue changes in the whole body by targeting specific binding sites. The visualisation of pathophysiology using specific tracers makes PET potentially suitable for early detection of disease activity, even before anatomic changes appear. In addition, it allows quantification of disease activity in order to accurately monitor therapeutic effects. Recently, our group found that disease activity of AS on PET-CT was clearly depicted with the tracer [18F]Fluoride with obvious superior targeting as compared to the reference tracers. [18F]Fluoride uptake in bone reflects local blood flow and regional osteoblastic activity because uptake takes place in the form of hydroxyapatite crystals, which form the mineral fluorapatite within the bone, especially at sites of bone remodelling. A study currently in progress of publication by our

group has shown the ability of [18F]Fluoride PET-CT imaging of bone formation in AS to predict response to anti-TNF treatment.

Study objective

[18F]Fluoride PET-CT scans visualize bone formation in spondyloarthritis patients

Study design

T0, T6, T12 and T24 weeks.

Contacts

Public

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Eligibility criteria

Inclusion criteria

Patients must be at least 18 years of age.

- Diagnosis of psoriatic arthritis according to the 2006 Classification Criteria for Psoriatic Arthritis (CASPAR) or ankylosing spondylitis according to the modified New York criteria
- Patients with clinically active disease as assessed by a physician;
- In PsA defined as clinically active disease with at least one clinically active enthesitis site and a clinical indication to start with Secukinumab.
- In AS defined as a Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) of 4 or higher and a clinical indication to start with Secukinumab.
- Treatment with disease modifying anti-rheumatic drugs (DMARDS) and non-steroidal anti-inflammatory drugs (NSAID) is permitted, provided that there is a stable dose for at least 4 weeks prior to inclusion and during the study up to 12 weeks of follow up.
- Treatment with oral corticosteroids up to 10mg daily is permitted, provided that there is a stable dose for at least 4 weeks prior to inclusion and during the study up to 12 weeks of

follow up. The anti-TNF control PsA group: prior treatment with one anti-TNF is permitted, given that the patient was intolerant for this anti-TNF (no primary failure)

- The AS biopsy group: start or treatment with either biological, NSAID and/or DMARD therapy is permitted. Patients must be able to adhere to the study appointments and other protocol requirements.
- Patients must be capable of giving informed consent and the consent must have been obtained prior to the study related procedures.

Exclusion criteria

- Prior Treatment with anti-IL-17 (for Secukinumab starters)
- Treatment with any investigational drug within the previous 3 months.
- Pregnancy or breast-feeding

Study design

Design

Study type:	Observational non invasive
Intervention model:	Other
Allocation:	Non controlled trial
Masking:	Open (masking not used)
Control:	N/A , unknown

Recruitment

NL	
Recruitment status:	Recruiting
Start date (anticipated):	15-10-2018
Enrollment:	48
Type:	Anticipated

IPD sharing statement

Plan to share IPD: Undecided

Ethics review

Positive opinion

Date: 12-08-2021

Application type: First submission

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
NTR-new	NL9661
Other	METC VUmc : 2018.001

Study results