Genotyping and phenotyping of skeletal deformities in patients with Osteogenesis Imperfecta

Gepubliceerd: 21-12-2020 Laatst bijgewerkt: 19-03-2025

this is an observational study identifying skeletal phenotypes of adult patients with different OI-types at microarchitectural level with HR-pQCT.

Ethische beoordeling	Niet van toepassing
Status	Werving nog niet gestart
Type aandoening	-
Onderzoekstype	Observationeel onderzoek, zonder invasieve metingen

Samenvatting

ID

NL-OMON23070

Bron
NTR

Verkorte titel
skeDOI

Aandoening

Osteogenesis Imperfecta

Ondersteuning

Primaire sponsor: Isala, Zwolle
Overige ondersteuning: contract funding

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

The main outcome parameters are volumetric BMD and tissue mineral density (TMD), cortical

and trabecular microarchitecture, and strength of the distal radius and tibia assessed with HR-pQCT. More specifically, BMD-parameters are determined for the total (Tt.BMD), cortical (Ct.BMD), and trabecular (Tb.BMD) bone and similar for TMD (Tt.TMD, Ct.TMD, and Tb.TMD, respectively). Microarchitecture parameters include trabecular bone volume fraction, number, thickness and separation (Tb.BV/TV, Tb.N, Tb.Th, and Tb.Sp, respectively) as well as cortical thickness (Ct.Po) and cortical porosity (Ct.Po). Parameters describing bone strength are estimated by means of micro-finite element (µFE-) models of the distal radius and tibia that are based on the HR-pQCT scans and include bone stiffness and failure load (FL).
The parameters will be obtained from the scans acquired with fixed and with length-dependent offset distance. For both scan protocols, the parameters will be averaged for each OI-type.

Toelichting onderzoek

Achtergrond van het onderzoek

Osteogenesis imperfecta (OI) is a rare hereditary connective tissue disorder characterized by increased bone fragility and skeletal deformity. Various causative genes are known, resulting in a diversity of phenotypic manifestations and severity of OI. Previous studies on skeletal phenotypes among different types of OI were mainly limited to measurements of areal bone mineral density (BMD), whereas bone quality is also determined by bone microarchitecture. High-resolution peripheral quantitative computed tomography (HR-pQCT) allows detailed assessment of microarchitecture and strength of the distal radius and tibia. Currently, the specific microarchitectural properties of the different OI phenotypes are not well defined and due to the short stature of patients with some OI-types, it is not known whether the standard protocol for HR-pQCT imaging is sufficient to assess microarchitecture in OI.

The primary objective of the study is to identify skeletal phenotypes of adult patients with different OI-types at microarchitectural level with HR-pQCT.
Secondary objectives are:
• to compare the skeletal phenotypes with the genotypes of the OI-types based on clinical symptoms, DXA-based areal bone mineral density and genetic mapping;
• to compare the skeletal phenotypes with sex and site-specific reference data for bone microarchitecture of an adult reference population;
• to explore the preferred site for HR-pQCT scan acquisition (fixed vs. length-dependent offset distance to select scan region).

In this cross-sectional study, approximately 120 patients with known OI, diagnosed and treated at the Center of Expertise of the Isala Clinic in Zwolle, will visit VieCuri Medical Center once. During this visit, four HR-pQCT scans will be performed; two of the distal radius and two of the distal tibia. The first set of scans (distal radius and distal tibia) will be acquired using the standard HR-pQCT imaging protocol with a fixed offset distance. The second set of scans (distal radius and distal tibia) will be acquired with a HR-pQCT imaging with a relative offset distance depending on the length of the lower arm and leg. Depending on the mobility of a

patient, it is possible that a patient is not able to position properly and comfortably before the gantry of the scanner, in which case the scan will not be acquired. All scans will be analysed to quantify volumetric bone mineral density, cortical and trabecular microarchitecture, and bone strength. The bone parameters will be compared with reference data and with type OI (based on clinical symptoms, DXA-based areal bone mineral density, and genetic mapping), which is already available as part or regular care at the Center of Expertise of the Isala Clinic in Zwolle. Finally, the bone parameters will be compared within the OI-types between the fixed measurement site and relative measurement sites.

Doel van het onderzoek

this is an observational study identifying skeletal phenotypes of adult patients with different OI-types at microarchitectural level with HR-pQCT.

Onderzoeksopzet

1 visit at VieCuri medical Center

Onderzoeksproduct en/of interventie

not applicable

Contactpersonen

Publiek

Isala, Zwolle
Roelina . Munnik

+31384245375

Wetenschappelijk

Isala, Zwolle
Roelina . Munnik

+31384245375

Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

main inclusion criteria:
- Patients with confirmed Osteogenesis Imperfecta
- Adult (>18 years)
- Recent DEXA-scan (< 3 years)

Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

main exclusion criteria:
- Patients who have had a fracture at recent medical history (<2 years) at both distal radii and tibiae.
- Patients who have had a malignancy at recent medical history (<2 years), who have been treated with glucocorticoids less than 3 months ago, who have severe kidney disease (eGFR <30 ml/min) or who suffer from other metabolic diseases affecting bone.
- Female patients who are pregnant.

Onderzoeksopzet

Opzet

Type:	Observationeel onderzoek, zonder invasieve metingen
Onderzoeksmodel:	Anders
Toewijzing:	N.v.t. / één studie arm
Blindering:	Open / niet geblindeerd
Controle:	N.v.t. / onbekend

Deelname

Nederland

Status:	Werving nog niet gestart
(Verwachte) startdatum:	01-03-2021
Aantal proefpersonen:	120
Type:	Verwachte startdatum

Voornemen beschikbaar stellen Individuele Patiënten Data (IPD)

Wordt de data na het onderzoek gedeeld: Nee

Toelichting
N/A

Ethische beoordeling

Niet van toepassing
Soort: Niet van toepassing

Registraties

Opgevolgd door onderstaande (mogelijk meer actuele) registratie

ID: 51155
Bron: ToetsingOnline
Titel:

Andere (mogelijk minder actuele) registraties in dit register

Geen registraties gevonden.

In overige registers

Register	ID
NTR-new	NL9134
CCMO	NL76107.075.21
OMON	NL-OMON51155

Resultaten