Flexion (+) / Extension (-)

Flexion / Extension kinematic curve measurements	Mean (SD)
Knee Flexum at Initial Contact	17.2 (8.8)
Average Angle at Loading phase (1to10)	17.5 (7.9)
Average Angle at Mid stance (11to30)	17.0 (6.1)
Average Angle at Term stance (31to50)	10.2 (6.3)
Average Angle at Push off (51to60)	11.7 (6.3)
Average Angle at Swing (61to100)	41.0 (6.2)
Maximum Flexion load midstance	20.9 (7.3)
Flexion excursion load midstance	3.7 (3.6)
Minimum Flexion stance phase	8.1 (6.7)
Amplitude	49.2 (9.8)

Adduction (+) Abduction (-)

Abduction / Adduction kinematic curve measurements	Mean (SD)
Average Angle at Initial Contact	5.1 (6.1)
Average Angle at Loading phase (1to10)	5.2 (6.4)
Average Angle at Mid stance (11to30)	5.4 (6.3)
Average Angle at Term stance (31to50)	3.9 (6.1)
Average Angle at Push off (51to60)	2.5 (5.9)
Average Angle at Swing (61to100)	4.1 (5.3)
Average Midstance / Initial Contact thrust	0.3 (1.7)
Amplitude	9.2 (3.5)

Figure. Study cohort three-dimensional knee kinematic curve measurements.

Frequency of mechanical factors linked to knee OA in the study cohort	
Varus alignment at initial contact	42 (70%)
Varus alignment during stance	42 (70%)
Knee flexion at initial contact	46 (76.7%)
Limited flexion excursion during loading	60 (100%)
Fixed flexion during stance	48 (80.0%)
Decreased sagittal plane range of motion	50 (83.3%)

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SKIN PENTOSIDINE IN VERY EARLY HIP/KNEE OSTEOARTHRITIS (CHECK) IS NOT A STRONG INDEPENDENT PREDICTOR OF RADIOGRAPHIC PROGRESSION OVER 5 YEARS FOLLOW-UP

P.A. Vos [†], P.M. Welsing [†], J. deGroot [‡], A.M. Huisman [§], J.C. Oostveen [‖], M. Reijman [¶], J. Damen [¶], S.C. Mastbergen [†], F.P. Lafeber [†]. [†] Univ. Med. Ctr. Utrecht, Utrecht, The Netherlands; [‡] TNO Quality of Life, Leiden, The Netherlands; [§] Sint Franciscus Gasthuis, Rotterdam, The Netherlands; [‖] Twenteborg Ziekenhuis, Almelo, The Netherlands; [¶] Univ. Med. Ctr. Erasmus MC, Rotterdam, The Netherlands

Purpose: Age-related changes in articular cartilage are likely to play a role in the aetiology of osteoarthritis (OA). One of the major age-related changes in cartilage is the accumulation of advanced-glycation-endproducts (AGEs). The present study evaluates whether pentosidine can predict radiographic progression and/or burden over 5 years follow-up in a cohort of early knee and/or hip OA.

Methods: The Cohort Hip and Cohort Knee (CHECK) is a cohort of participants with very early OA. In this study data of 5 years follow-up were used. Radiographic progression and burden were assessed by X-rays of both knees and hips (K&L and Altman scores). Radiographic OA burden was expressed as the summed K&L grade or Altman scores of both hips and knees. Radiographic OA progression was expressed as the area under the curve (AUC) of the summed K&L grade over the 5 years minus the baseline value over 5 years. The burden of radiographic joint damage was expressed as the AUC over 5 years. For the summed Altman scores for JSN and osteophyte formation the same approaches were used to determine progression and burden scores per patient.

Baseline skin pentosidine levels (and urinary CTXII as a comparator) were measured by HPLC (and ELISA). Univariate and multivariate associations including baseline radiographic damage, age, gender, BMI and kidney function were performed.

Results: Of 183 participants all data were available. At 5-year follow-up radiographic progression of OA was seen (sum K&L score 1.69 ± 1.13 at T0 versus 3.30 ± 1.81 at T5). Both pentosidine and uCTXII correlated with this radiographic progression and burden (ie progression AUC sum K&L score R=0.167 p=0.024 and R=0.323 and p=0.000 for skin pentosidine and urine CTXII, respectively). In multivariate analysis, in general pentosidine did not have an added predictive value to uCTXII for progression nor burden of the disease. The best prediction was obtained for burden of radiographic damage (R2=0.60-0.88), but this was predominantly determined by baseline radiographic damage (without this parameter R2=0.07-0.17). Interestingly, pentosidine significantly added to prediction of osteophyte formation, whereas uCTXII significantly added to prediction of JSN in multivariate analysis.

Conclusion: Pentosidine adds to prediction of radiographic progression and burden of osteophyte formation and uCTXII to radiographic progression and burden of JSN, but overall skin pentosidine did not perform better than uCTXII in predicting radiographic progression or burden. Burden of damage over 5 year is mainly determined by radiographic joint damage at baseline.

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OSTEOARTHRITIS OF THE KNEE AT 6-YEAR FOLLOW-UP AND THEIR PROGNOSTIC FACTORS IN PATIENTS WITH TRAUMATIC KNEE COMPLAINTS IN GENERAL PRACTICE

M. Kastelein, P. Luijsterburg, I. Koster, J. Verhaar, B. Koes, S. Bierma-Zeinstra, E. Oei. Erasmus MC, Erasmus Univ. Med. Ctr., Rotterdam, The Netherlands

Purpose: To identify degenerative abnormalities of the knee on magnetic resonance imaging (MRI) and radiography 6 years after knee trauma, and their relation with persistent knee complaints and prognostic factors at baseline (including MRI findings).

Methods: Adults (18-65 years) with incident traumatic knee complaints who visited their general practitioner were followed for 6 years. To identify degenerative abnormalities, an MRI was made at baseline and at 6-year follow-up, and a radiograph was made at 6-year follow-up. Logistic regression analysis was used to calculate associations between the various degenerative abnormalities on the 6-year MRI and the 6-year radiograph, their relation with persistent knee complaints, and to identify baseline prognostic factors associated with knee osteoarthritis (OA) at the 6-year MRI.

Results: On the 6-year radiograph, 60% of the patients showed no OA, 28% OA with a Kellgren & Lawrence (K&L) grade 1 and 13% had a K&L grade 2. On the 6-year MRI, 55% of the patients showed cartilage defect(s), 45% osteophyte(s), 36% subchondral cyst(s), 40% bone marrow edema, 21% meniscal subluxation, 83% meniscal degeneration, 11% effusion and 11% a Baker's cyst. Most degenerative abnormalities on the 6-year MRI were significantly related with the K&L score on the 6-year radiograph. Only a few abnormalities [lateral cartilage defect(s), medial osteophyte(s) and medial meniscal subluxation] were also significantly related with persistent knee complaints at 6-year follow-up. For knee OA seen on the 6-year MRI, 32% of the patients showed new onset or progressive knee OA. Age, history of non-traumatic knee complaints and bone marrow edema on the baseline MRI were independently related with new onset or progressive knee OA on the 6-year MRI.

Conclusions: Degenerative abnormalities on MRI of the knee are related to the K&L score on knee radiography; however, not all abnormalities are reflected in clinical outcome. Six years after knee trauma, knee OA is present in 32% of the patients. Age, history of non- traumatic knee complaints and bone marrow edema are possible predictors for new onset or progressive knee OA 6 years after knee trauma.

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BIOMECHANICAL MECHANISMS UNDERLYING TREATMENT EFFECTS OF EXERCISE THERAPY IN PATIENTS WITH KNEE OSTEOARTHRITIS: DATA FROM A RANDOMIZED CONTROLLED TRIAL