

## 019

**THE EFFECT OF LONG-TERM VIGOROUS PHYSICAL ACTIVITY ON KNEE CARTILAGE AMONG ADULTS WITHOUT CLINICAL KNEE DISEASE**

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**Purpose:** Whether participation in long-term vigorous physical activity effects knee cartilage is unclear, and may depend on the state of knee health. In this study, we examined the association between vigorous physical activity levels over a decade, and the subsequent changes in knee cartilage among adults with no clinical knee disease. We then examined whether this effect differed in those with and without bone marrow lesions (BMLs), as an indicator of preclinical joint damage.

**Methods:** 297 healthy adults aged 50-79 years with no history of knee injury or joint disease were recruited from an existing study. Physical activity and anthropometric data were obtained via questionnaire during 1990-94 and 2003-04 to devise a persistence of vigorous physical activity score. Each subject underwent knee magnetic resonance imaging (MRI) in 2003-04 and again in 2006-07. Cartilage volume, defects and BMLs were measured using validated methods.

**Results:** Persistent participation in vigorous physical activity over the study period was associated with an increased risk of worsening of medial knee cartilage defects (OR 1.5; 95% CI 1.0 - 2.3). In the subgroup with BMLs, persistent vigorous physical activity was associated with a significant increase in risk of worsening of medial knee cartilage defects (OR 3.4; 95% CI 1.0 - 16.5) and an increased rate of loss of medial knee cartilage volume (21.6 mm<sup>3</sup> per annum, 95% CI -0.4, 43.6). No significant associations were seen in those without BMLs.

**Conclusions:** In knees with BMLs, persistent participation in vigorous physical activity is associated with adverse cartilage changes in the medial knee compartment. This suggests that the long-term effects of vigorous physical activity on cartilage may depend on the pre-existing health of the joint. In otherwise clinically healthy knees, BMLs identify those likely to have an adverse response to vigorous physical activity.

## 020

**DETERMINANTS OF LONG-TERM RADIOGRAPHIC AND CLINICAL PROGRESSION OF HAND OSTEOARTHRITIS**

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**Purpose:** Little knowledge about the natural history of hand osteoarthritis (HOA) and its determinants is available. Therefore we investigated the determinants of radiographic and clinical progression of HOA over a period of 6 years.

**Methods:** Radiographic and clinical measures were obtained at baseline and after 6 years in 242 HOA patients (mean age 59.8 yrs, 83% women) participating in the Genetics, ARthrosis and Progression (GARP) study. HOA was defined by the ACR criteria for clinical HOA or the presence of structural abnormalities in the hand (multiple bony swellings/radiological OA). Standardized hand radiographs were scored in pairs in chronological order by consensus opinion of two experienced readers using the OARS

atlas. Osteophytes (OP) and joint space narrowing (JSN) were graded 0-3, and the presence of subchondral erosions (SE) was assessed. Self-reported hand pain and functional limitations were assessed with the Australian/Canadian Osteoarthritis Hand Index LK 3.0 (AUSCAN). A standard diagram of hand joints was used to identify the number of painful joints. During physical examination pain intensity upon lateral pressure in all hand joints was graded 0-3 and the number of bony swellings was recorded. Mean change for AUSCAN, pain intensity, OP and JSN scores were calculated. Radiographic progression was defined as a change in OP or JSN greater than the smallest detectable change (SDC). Logistic regression analysis was used to assess baseline determinants of radiographic progression. Determinants of clinical progression, reflected by change in AUSCAN scores, were evaluated using linear regression. In both analyses adjustments were made for age, sex and body mass index (BMI).

**Results:** Radiographic progression was present in 53% of patients. The mean (SD) progression in OP and JSN was 1.8 (2.3) and 1.1 (2.0), respectively. The mean (SD) change on AUSCAN pain and function was 0.5 (4.1) and 2.0 (6.8), respectively. The pain intensity score increased with a mean (SD) of 2.7 (7.0). Determinants of radiographic progression, adjusted for age, sex and BMI, are shown in the table. Multiple regression with all determinants showed that the number of bony swellings, OP and the presence of erosive disease remained associated with radiographic progression. The number of painful joints at baseline was positively associated with progression of AUSCAN pain. No other determinants of progression of AUSCAN pain and function were found. Radiographic progression was not associated with change in AUSCAN scores.

Risk of radiographic progression in relation to baseline clinical and radiographic characteristics

	Risk ratio	95% CI
Number of painful joints	1.2	0.9-1.5
AUSCAN pain >7	1.5	1.2-1.7
AUSCAN function >10	1.2	0.9-1.5
Pain intensity score >2	1.4	1.1-1.7
Number of bony swellings > 8	1.8	1.4-2.1
OP score >9	1.8	1.4-1.8
JSN score >18	1.4	1.1-1.6
Number of SE ≥2	1.8	1.5-2.0

**Conclusions:** Over a period of 6 years considerable radiographic progression of HOA was demonstrated. Structural abnormalities were the strongest determinants of radiographic progression. However, clinical deterioration was less pronounced and difficult to predict from baseline characteristics. Radiographic and clinical progression were not associated. This has implications for the appreciation of clinical outcomes in longitudinal OA studies.

## 021

**PAIN IMPROVEMENTS FOLLOWING TOTAL JOINT REPLACEMENT: WHAT YOU MEASURE MATTERS**

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**Purpose:** The Intermittent and Constant Osteoarthritis Pain (ICOAP) measure, a new measure, was developed under an OARSI/OMERACT initiative as one element for determining outcome in DMOAD trials for osteoarthritis (OA) of the hip or knee. It was developed from interviews with people with OA of the hip and knee. It includes 5 items assessing 'constant' hip or knee pain and 6 items assessing 'intermittent' hip or knee pain; item response options are on a 4-point scale from 'not at all' to 'ex-