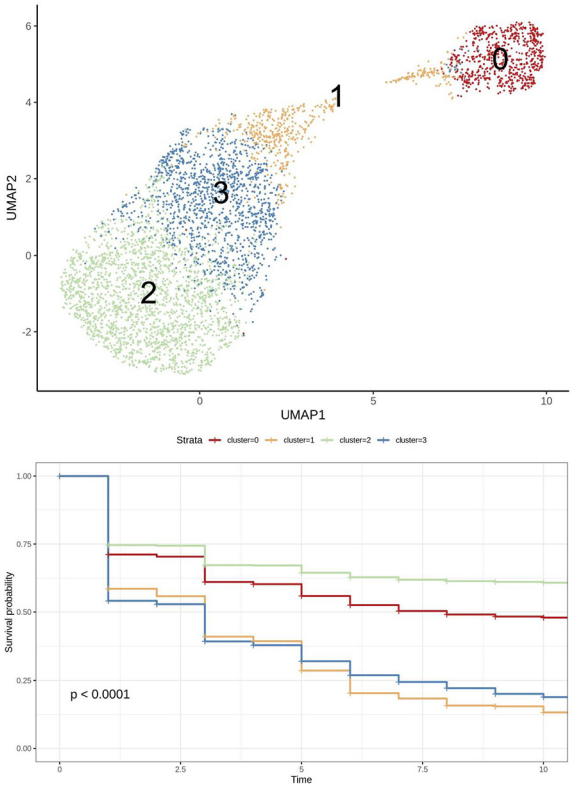
Results: Unsupervised clustering with 1,033 variables revealed great heterogeneity of phenotypes. By determining patterns in the top variables in each cluster, we identified 4 distinct phenotypes. These included cluster 0 (relative normal knee with better health conditions), cluster 1 (depressed with pain and worse health conditions), cluster 2 (better nutrients and health condition) and cluster 3 (poor knee condition with better diet) (Figure 1). Survival analysis showed that clusters 1 and 3 had better disease progression compared to clusters 0 and 2 in both 5-year and 10-year follow-ups (Figure 2).
Conclusions: Using UMAP and clustering analysis, we can identify different knee OA phenotypes, which can be used for purposes of personalized treatments, monitoring disease progression and treatment responses.



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PINCER MORPHOLOGY IS NOT ASSOCIATED WITH DEVELOPMENT OF HIP OSTEOARTHRITIS WITHIN 10 YEARS; A NATIONWIDE PROSPECTIVE COHORT STUDY (CHECK)

N. Riedstra, J. Herfkens, J. Tang, S.M. Bierma-Zeinstra, J. Runhaar, M.M. van Buuren, R. Agricola. *Erasmus Med. Ctr., Rotterdam, Netherlands*

Purpose: Pincer morphology is an overcoverage of the acetabulum relative to the femoral head (figure 1). During motion of the hip, this might lead to an abutment between the acetabular rim and femoral head-neck junction, a process referred to as pincer-type femoroacetabular impingement. This abnormal contact between the femoral head and acetabulum might potentially lead to damage of the labrum and articular cartilage. However, to date, results on the relationship between pincer morphology and hip osteoarthritis (OA) have been conflicting and previous prospective cohort studies typically did not find an association. It has been hypothesized that pincer morphology might lead to a gradual development of hip OA over years, but only few studies have long term follow-up. Furthermore, pincer morphology is usually only quantified on AP pelvic radiographs, which only determines lateral overcoverage. Using a straight lateral radiographic view, anterior overcoverage can be quantified, which might be more relevant as the hip can potentially impinge in this area during hip flexion, a common movement and position of the hip. Our aim was therefore to determine the relationship between an anterior and lateral located pincer morphology and development of hip OA within 10-years follow-up using data from the prospective CHECK cohort.
Methods: CHECK is a prospective, nationwide cohort study of 1002 participants (2004 hips) aged 45-65 (mean 55.9 years). Inclusion criteria were: pain or stiffness in the knee or hip, and no earlier consultation for these complaints or a first consultation with a general practitioner within 6 six months for these complaints before entry. Standardized anteroposterior (AP) pelvic and false profile (FP) radiographs were taken at baseline and at the 10-year follow-up visit. Acetabular coverage on the AP pelvic radiograph was quantified by the Lateral Center Edge Angle (LCEA), which determines acetabular coverage on the lateral side. Acetabular coverage on the FP radiograph was quantified by the Anterior Center Edge Angle (ACEA), which determines acetabular coverage on the anterior side (figure 2). Pincer morphology was defined as an LCEA and/or ACEA >40° on either the AP or FP view. Development of incident hip OA was defined by Kellgren & Lawrence (K&L) grade ≥2 or total hip replacement (THR) at 10-year follow-up. End-stage OA was defined by a K&L grade ≥3 or THR). Of the initial 2004 hips, 354 hips did not have KL grading at 10 years follow-up (lost to follow-up or missing radiographs), 207 hips had a baseline K&L grade of >1, of 176 hips AP hip views were obtained instead of AP pelvic views and on 111 baseline hips the LCEA and/or ACEA could not be reliably determined. This leaves 1156 hips for the current analyses. The associations between baseline pincer morphology and development of hip OA within 10 years were estimated using logistic regression with generalized estimating equations and expressed as odds ratios (OR). All estimates were adjusted for age, sex, BMI and baseline K&L grade (0 or 1).
Results: Of the included participants (82% female), the mean age was 55.7 (±5.2) years and mean BMI 26.2 (± 4.1) at baseline. At baseline, 75% of the included hips had no signs of radiographic OA (K&L=0), whereas 25% had doubtful OA (K&L=1). Within 10 years, 496 hips (43%) developed incident OA and 61 hips (5%) developed end-stage OA. Pincer morphology was not associated with either incident OA nor end-stage OA. This was true for all definitions of pincer morphology (defined on the AP view only, on the FP only and the combination of pincer morphology on both the AP and FP view).
Conclusions: Baseline pincer morphology was not associated with the development of hip OA at 10 years follow-up in the CHECK cohort. There is no indication that pincer morphology leads to hip OA on the long term. This is one of the first studies that investigates anterior pincer morphology, but also pincer morphology on the anterior side of the acetabulum did not increase the risk for hip OA.